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Fisheries resources and developmental potentials of Usuma River in Gwagwalada, Abuja

Oboh, A. / Dan-Kishiya, A. S.

Abstract

A study on fisheries resources and developmental potentials of Usuma River in Gwagwalada, Abuja was carried out between August and December, 2012 using standard methods and procedures. A total of sixteen (16) fish species belonging to nine (9) families were identified. The fish family Cichlidae was the most dominant by number representing 19.2% of the total catch. This was followed by the family Bagridae (17.5%) and family Cyprinidae (17.5%). There were more females than males which are an indication that with good monitoring, control and surveillance (MCS) the production potential of the river will be high.

Keywords: Fisheries resources, development potentials, fish species diversity, Usuma River.

Introduction

The demand for fish in Nigeria keeps increasing even as the fish yields of most of Nigeria's fisheries are diminishing. The reasons for the depletion of fish stock include among others, overfishing, application of destructive fishing methods, loss of habitats, pollution and inadequate management of the fisheries resources. Most of the capture fisheries in Nigeria have been exploited to their maximum as fisheries and artisanal fishing are important as means of livelihood and source of essential protein. Since millions of Nigerians rely on inland fisheries for food and income, fisheries management is imperative. Fisheries are a renewable resource that requires effective and efficient conservation and management strategies for increased production (Odogbo, 2001). However, a comprehensive understanding of the fish species composition of water bodies is essential for the sustainable exploitation of fisheries resources (Jamu and Ayinla, 2003). Fish can only be harvested at the maximum sustainable yield when all the biological parameters are known (Ezenwaji and Ezenwaji, 2009). Conducting fish surveys enable better understanding of the dynamics of a fish community which allows for proper management decisions.

The species composition of Usuma River in Gwagwalada has never been studied so this paper provides preliminary data on the composition and biometry of the fish species and discusses how these can be effectively managed to yield optimum production.

Materials and Methods

- Study area:** The study was conducted in the headquarters of Gwagwalada area council, which is one of the six area councils in Abuja, the federal capital territory (FCT) of Nigeria. Gwagwalada is located between latitude 8° 55' and 9° 00' N and longitudinal 7° 00' and 7° 05' E (Ishaya and Obaje, 2009). Gwagwalada with an area of 1,043km² is one of the largest satellite towns in the FCT with a population of 157,770 as at 2006 population census. Usuma River is a fresh water body that has its source from Bwari hills in Bwari area council and runs through Gwagwalada town (from Ungwan Dodo through Dagiri to Kutunku), to empty into River Gurara which is a tributary to River

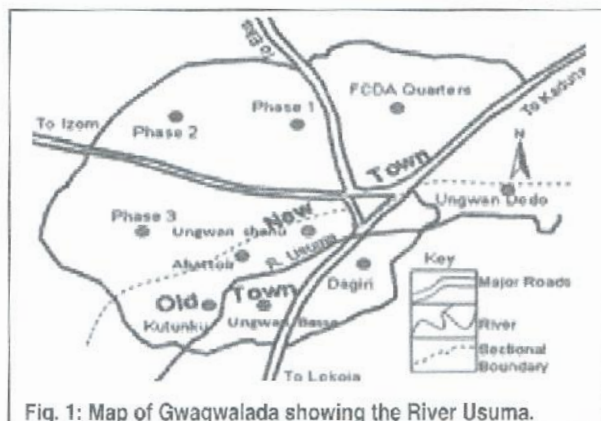


Fig. 1: Map of Gwagwalada showing the River Usuma.

Niger. The map of Gwagwalada showing the River Usuma is presented in Figure 1. The presence of River Usuma with numerous tributaries and the large influx of people on a daily basis make Gwagwalada town an important commercial fish market.

- **Fish sampling:** Fishes were sampled twice in a month for a period of six months from the fishermen catches. The fishermen used a variety of fishing gear such as hook and line, gill nets and cast nets of various mesh sizes. Fishes obtained were kept in polythene bags and transported to the Biology laboratory in the department of Biological Sciences of University of Abuja for identification and morphometric measurements. In the laboratory, the fishes were identified using keys and descriptions by Reed et al. (1967) and Idodo-Umeh (2003). They were weighed and their sex determined by examining their genital papilla according to Legendre (1986).

Results and Discussion

A total of 16 fish species belonging to 9 families were recovered from Usuma River. The fish family Cichlidae was the most dominant by number representing 19.2% of the total catch. This was followed by the families Bagridae and Cyprinidae which were both 17.5% respectively. The family *Mochokidae* made up 11.7%, Clariidae 10.8% and the other families: *Mormyridae*, *Characidae*, *Citharinidae* and *Schilbidae* made up 23.3% of the total catch.

The percentage composition of fish species identified in the study revealed *Tilapia zilli*, *Oreochromis niloticus* and *Clarias gariepinus* as the dominant species while the least species were *Mormyrus rume*, *Marcusenius cyprinoides*, *Clarotes laticeps*, *Labeo coubie* and *Citharinus latus*. The type of fishing gear employed may be responsible for the low catches of some species. *Citharinus latus* for instance was only caught with cast net and for most of the duration of the study cast net was not used. In terms of diversity of species, the families Bagridae and Cyprinidae with 3-species representations respectively were the most diversified. The percentage occurrence of fish by sex showed that the percentage of female was higher than male in the river. The composition of fish species caught in the river and their relative abundance are presented in Table 1.

Table 1: Composition of fish species in Usuma River.

S/N	Family	Species	Local names (Hausa)	No.	%	Wt(g)	%	Sex (%)MF
1	Clariidae	<i>C.gariepinus</i>	Tarwada	13	10.8	306.7	7.12	30.8 69.2
2	Cichlidae	<i>T. zilli</i>	Gargaza	12	10.0	83.5		33.3 66.7
		<i>O. niloticus</i>	Gargaza	11	9.2	100.9		27.3 72.7
		Sub total		23	19.2	184.4	4.28	
3	Mormyridae	<i>M. rume</i>	Milligi	5	4.2	760.8		20.0 80.0
		<i>M. cyprinoides</i>	Faya	5	4.2	628.0		20.0 80.0
		SUBTOTAL		10	8.3	1388.8	32.24	
4	Mochokidae	<i>S. clarias</i>	Farin kurungu	6	5.0	100.8		20.0 80.0
		<i>S. omias</i>	Kurungu	8	6.6	143.2		33.3 66.7
		SUBTOTAL		14	11.7	244.0	5.66	
5	Bagridae	<i>A. occidentalis</i>	Buro	10	8.3	222.0		30.0 70.0
		<i>B. bayad</i>	Flago ruwa	6	5.0	435.7		16.7 83.3
		<i>C. laticeps</i>	Kakpo	5	4.2	80.3		20.0 80.0
		SUBTOTAL		21	17.5	738.0	17.13	
6	Cyprinidae	<i>L. coubie</i>	Bakin dumi	5	4.2	256.0		40.0 60.0
		<i>B. lagoensis</i>	Nabele	10	8.3	126.2		30.0 70.0
		<i>G. waterloti</i>	Farin dumi	6	5.0	706.0		16.7 83.3
		SUBTOTAL		21	17.5	1088.2	25.26	
7	Characidae	<i>A. dentex</i>	Shemani	6	5.0	237	5.50	33.3 66.7
8	Citharinidae	<i>C. latus</i>	Falia	5	4.2	35.2	0.81	20.0 80.0
9	Schilbedae	<i>S. mystus</i>	Nalanga	7	5.8	84.9	1.97	28.6 71.4
	GRAND TOTAL			120	100	4307.8	100	

The diversity of species in Usuma River is comparable to other rivers in Nigeria. Nayaya et al. (2012) identified thirteen (13) species of fish belonging to 12 families and 13 genera in Gaji River, Bauchi State. Ita (1993) reported an estimated 230 species of fish have been recorded from the rivers of Nigeria: 23, 28 and 22 species were recorded in Anambra, Kaduna and Sokoto/Rima rivers respectively, while 39, 23 and 23 species, respectively, were recorded in Cross River, Ogun and Osun rivers (Ita, 1993). Obe and Jenyo-Oni (2011) assessed the fish biodiversity in Oni River, Ogun State, and found 28 species belonging to 16 families. The diversity of species in Usuma River Gwagwalada is higher than found in the lower Usuma Reservoir in Bwari Abuja. Dan-kishiya et al. (2012) reported a total of 11 species and 5 families in the lower Usuma Reservoir in Bwari Abuja.

With effective management, control and surveillance, the fishes of the Usuma River may be sustainably managed to improve fish production to the benefit of the community. Data that fisheries managers need in developing and implementing management measures that would suit the river would need to be collected. These may include estimating the number of

fishermen along the length of the River from Ungwan Dodo through Dagiri to Kutunku, inspection of their fishing gears and landing sites, observing their fishing effort and measuring their catches.

The management approach that involves management, control and surveillance (MCS) has been recommended for the sustainable management of fisheries. This approach according to Everett (2005) is critical to ensuring that management arrangements are implemented and resources are not over exploited. The approach includes the following; monitoring the collection, measurement and analysis of species composition, fishing effort, by-catch, area of operations, etc. Control means controlling the conditions under which resources can be harvested while surveillance involves the regulation and supervision of fishing activity to ensure that national legislation and terms, conditions of access and management contained in fisheries legislation are adhered to (Everett, 2005).

Conclusion

Even though there is presently no uniform federal inland fisheries management policy in Nigeria, some States have promulgated their fisheries edicts that are yet to be effectively implemented (Ita, 1993). Some aspects of these edicts could be applied to the Usuma River. These include registration and licensing of fishermen, prohibition of the use of poison and explosives, mesh and gear size regulation and closed season and area. Studies to determine the spawning ground and season of the fishes in the river are necessary in order to determine the particular area to be closed to fishing and at which season. This is to protect the spawning stock of commercially valued species. Mesh size regulation prevent over exploitation of young fish, before they attain sexual maturity (Ibrahim et al., 2009).

To ensure the success of the development and management of the fisheries, the fishers and other stakeholders would need to be involved in the planning and implementation of policies as it has been observed that failure of fisheries development policies result from the exclusion of stakeholders from various management and development processes. The degree of participation is enhanced when stakeholders have decision-making roles in matters of policy design (Ovie and Raji, 2006). Therefore, seminars and workshops must be organized for the fishermen to make them understand the benefits of fishing sustainably in the river and also make their contributions.

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