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Assessment of Fish Landed by Artisanal Fishers in Imo River at Owerri-Nta, Abia State, Nigeria

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ABSTRACT

Assessment of fish landing by artisanal fishers in Imo River at Owerri-Nta was conducted from January-December, 2013, using statistical frame survey and catch assessment survey. Seven fish families made up nine fish species, with their local names, were recorded. The fish species *Tilapia zillii*, a cichlid was the most dominant with a total value of 3,342 and 22.87% in terms of numbers and percentage abundance respectively. The *Chrysichthys nigrodigitatus*, with 13.08% percentage abundance, was the species of the highest market value. Thirty-six artisanal fishers (all part time) with fourteen canoes, using gill nets, cast nets, basket traps, drum traps, hook and line set and Malian trap as fishing gears were recorded in the river with a total catch of 14,611 in terms of numbers and a mean catch of 43 fishes/canoe. Based on the catch composition, the river was productive and comparable with other smaller but productive Nigeria Rivers, reservoirs and lakes. The Monitoring, Control and Surveillance (MCS) system was suggested for management consideration, with emphasis on registration of fishers and their fishing equipment, enforcement of minimum mesh size of 3 inch and establishment of community based cooperative scheme. It was also suggested that the river be stocked with some commercially important species to improve the fishery situation of the study area.

Key words: Conservation, diversity, Malian traps, distribution

INTRODUCTION

Nigeria is blessed with over 14 million of hectares of reservoirs, lake, ponds and major rivers capable of producing over 980,000 metric t of fish annually (FDF., 2007). However, majority of these reservoirs are built on seasonal rivers, with paucity of fish species composition, resulting in low fish productivity (Ita *et al.*, 1982). Statistical surveys have shown that the demand for fish in the country exceeds supply and also, the domestic production is still very low, considering the increasing human population. The annual fish consumption and demand in Nigeria has been estimated to be over 1.3 million metric t and the total domestic production is just about 450,000 metric t per annum (Tsadu *et al.*, 2006). Artisanal fisheries sector made up the most important sector, which accounts for the major fish supply in the developing world. According to FAO (1991) assessment, out of 1.9 million people engaged in full time, part time and seasonal fishing about 98% belongs to the artisanal sector. Artisanal fishery is however, characterized with low technology, lack of modern equipments and low fund to expand, etc., resulting in labor intensiveness of the sector, with little or no opportunities to expand. These problems however

forced the fishers to seek for additional income in non fishing activities. Since, fish is the cheapest source of animal protein to human, there is need to protect and manage the fishery in the rivers, lakes and reservoirs for the communities. In order for this to be done effectively, detail knowledge of the artisanal fisheries of these water bodies is of great importance.

Fishery business is very lucrative and plays a significant role in the economic condition of fishing communities. Fishery resources, if properly managed and adequately utilized create employment opportunities and provide a cheaper source of quality dietary protein thereby, improving the livelihood of the fishing communities and the populace of Nigeria at large. It is widely accepted view that the fish yields of most Nigerian inland waters are generally on the decline (Jamu and Ayinia, 2003). The decline of these fisheries has been attributed to a wide range of causes ranging from environmental degradation of the water bodies to inadequate management of the fisheries resources. For sustainable exploitation of these fisheries resources a crucial management tool is to have a comprehensive understanding of the fishery situation of the water bodies. This can be achieved by the assessment of artisanal fishery of the water bodies. Imo River at Owerri-Nta has received little research attention, when compared to other rivers, lakes and reservoir in Nigeria. This research therefore, becomes necessary because, it seeks to provide preliminary data on the fishers' catch composition and relative abundance of the species for an effective management and sustainable utilization of the fishery resources in the study area.

MATERIALS AND METHODS

The study was carried out in Imo River at Owerri-Nta Abia State, Nigeria, as shown in Fig. 1. The Imo basin is located south of the Okigwe Hills from where it rises between latitudes $4^{\circ}45'N$ and $6^{\circ}17'N$ and longitudes $6^{\circ}35'E$ and $8^{\circ}10'E$. The major tributaries of the Imo River include, the Rivers Ibu, Iyiba, Uchu, Anamiri, Iyeachara, Eme and Otamiri (Ita, 1993). All these tributaries are perennial. The Imo River at Owerri-Nta is located within longitude $7^{\circ}17'E$ and Latitude $5^{\circ}18'N$ (Fig. 2). The river serves as, a source of water for domestic uses, fishery, recreational activities and agricultural irrigation programs for people settling close to the water body. Apart from the above listed uses, the river serves as, a source of sand for sand excavators. A frame survey of fishing



Fig. 1: Picture of the study location

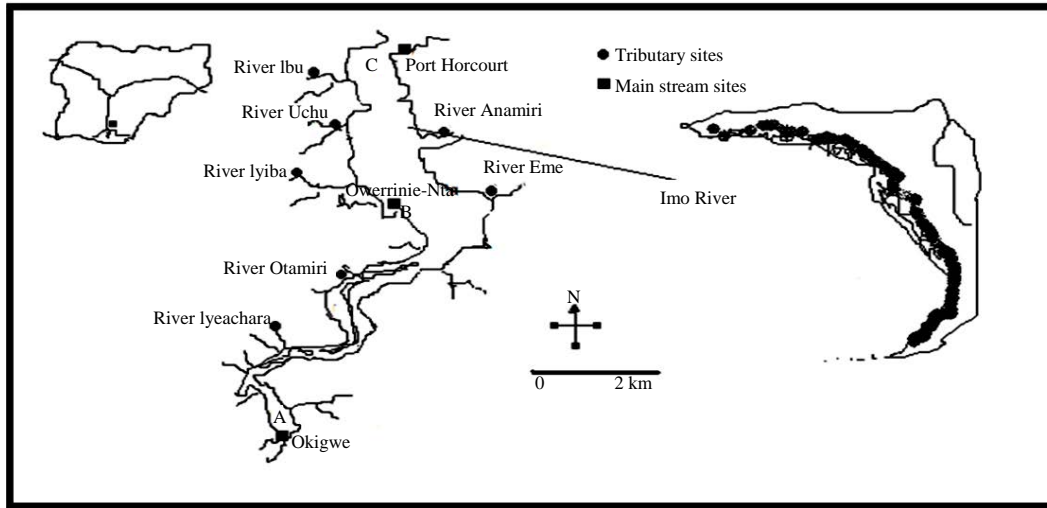


Fig. 2: Map of Imo River showing Owerri-Nta, the study location (Ukagwu *et al.*, 2012)

communities was carried out employing the complete census technique (Bankole *et al.*, 1994) during the survey, existing landing sites, number of fishers and species landing were counted. Catch Assessment involved the actual counting of the fishes caught by the local fishers and identifying the species using, identification key (Key to Fresh Water Fish Species of West Africa). The assessment of the fisher's catch was mainly on Saturday. This was because, active fishing in the study area was mostly on Saturday. Statistical analysis of the results was based on the use of bar charts (Spence, 2006).

RESULTS AND DISCUSSION

Table 1 shows the species identified in the fishers catch on the river, using identification key, during the assessment. Their common and local names were also noted. Nine fish species belonging to seven families were identified in the fisher's catch on the river during the survey. The diversity of 9 families and 7 fish species in Imo River at Owerri-Nta in artisanal fisheries assessment are comparable with fish diversities in small reservoirs impounded across seasonal rivers, such as; 5 families and 7 species in kontaroga Reservoir, reported by Ibrahim *et al.* (2009). Similarly, Onuoha *et al.* (2010) recorded 26 fish species belonging to 7 families during the study of NtakInyang stream. The variation in number of fish species and families in the fisher's catch across different water bodies could be attributed to fishing methods and gear selectivity, which could also be as a result of fish size and target species. The distribution of the fish species could also depend upon the biotic and abiotic factors of the ecosystem including rainfall (Moses, 1987, 2001), volume of river discharge and surface area of river basin (Hugueny, 1989; Livingstone *et al.*, 1982), hydrographic heterogeneity-mean depth, water level fluctuations, morphometric features and nature of the river bottom, etc (Hugueny, 1989). Table 2 shows the percentage abundance of the various species represented in the catch. *Tilapia zilli* (22.87%), *Hemichromis fasciatus* (19.83%), *Tilapia guineensis* (13.09%), *Chrysichthys nigrodigitatus* (13.08%), *Hepsetus odoe* (8.90%), *Alestes macrophthalmus* (6.77%), *Parachanna obscura* (6.10%), *Malapterurus electricus* (5.40%) and *Erpethoichthys calabaricus* (3.96%). The dominance of *Tilapia zilli* on the fisher's catch in Imo River at Owerri-Nta agrees with Okereke (1990), on a related study in Otamiriukwa River. Also,

Table 1: List of fish families and species identified in Imo River at Owerri-Nta, Abia state

Fish families/species	Common name	Local name
Alestidae		
<i>Alestes macrophthalmus</i>	Tiger fish	Sako
Cichlidae		
<i>Hemichromis fasciatus</i>	Tilapia	Atabala
<i>Tilapia guineensis</i>	Tilapia	Atabala
<i>Tilapia zilli</i>	Tilapia	Atabala
Claroteidae		
<i>Chrysichthys nigrodigitatus</i>	Catfish	Okpor
Channidae		
<i>Parachanna obscura</i>	Snakehead	Snakehead
Hepsetidae		
<i>Hepsetus odoe</i>	Tiger fish	Sako
Malapteruridae		
<i>Malapterurus electricus</i>	Electric catfish	Eruru
Polypteridae		
<i>Erpethoichthys calabaricus</i>	Rope fish	Iroro

Table 2: Fish species composition and their percentage abundance in the total catch during the twelve months of catch assessment

Fish species	No.	Abundance (%)
<i>Tilapia zilli</i>	3,342	22.87
<i>Hemichromis fasciatus</i>	2,898	19.83
<i>Tilapia guineensis</i>	1,912	13.09
<i>Chrysichthys nigrodigitatus</i>	1,911	13.08
<i>Hepsetus odoe</i>	1,301	8.90
<i>Alestes macrophthalmus</i>	989	6.77
<i>Parachanna obscura</i>	891	6.10
<i>Malapterurus electricus</i>	789	5.40
<i>Erpethoichthys calabaricus</i>	578	3.96
Total	14,611	

the Cichlids dominated the catch by number and contributed 55.81% to the total number of fish caught on the river followed by *Chrysichthys nigrodigitatus* with 13.08% abundance in the catch. The dominance of the fish family Cichlidae have been reported in Tiga Dam (Ita, 1984), Zaria Reservoir (Balogun *et al.*, 2000) and Ero Reservoir (Kester *et al.*, 2007).

It is important here to emphasize key considerations relative to development of management system for the Imo River at Owerri-nta, Abia State. A number of fishermen were found using small mesh size gillnets of one finger (1 inch) to crop the juveniles of highly valued fish species. Therefore, fishing pressure, both in terms of the number of fishermen and the kinds of fishing gear in use, has a depurative effect on the abundance and sizes of commercially exploited species, such as; *Chrysichthys nigrodigitatus*, *Hepsetus odoe*, *Parachanna obscura*, the cichlids, etc. However, a long time series of catch data is required for better estimate of the CPUE for the fisheries of the river. However, analysis of 24 months catch assessment is required, before the current yields can be determined. The current information also adds to the baseline information needed in measuring future changes in species biomass and number, particularly, it identifies species of ecological significance with reference to the study area. It is therefore, recommended that the river should be stocked with fingerlings of some commercially important fresh water fish species to boost its productivity.

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