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Landing fish catch assessment of artisanal fishing in the polluted river nun, Amassoma Axes, Bayelsa state

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Abstract

The catch Composition of artisanal fishery in River Nun, Amasoma Axis was conducted from September, 2017-February, 2018 using catch assessment survey. This was done in order to gauge the effect of human induced pollution on catch composition of the heavily polluted River Nun at Amasoma Axes and its implication on food security. The catch compositions of all fishers along the River were sampled monthly for six (6) consecutive months. The numbers and type of fish caught were identified to their species level using standard identification keys. They were counted and the numbers recorded for each species. The types of fishing gear employed by fishers were also recorded. Results reveal that 72 fish species from 24 families were identified from 385 individual fish. 11 fish gear types were employed with the gill net being the most predominantly used gear. The cichlidae (*Tilapia* spp) were the most dominant in terms of number of abundance (7.79%), followed by the *Synodontis resupinatus* (3.11%), *Synodontis robbianus* (2.85%), the mormyridae and mochokidae were the family with highest number of species in the river. Artisanal fishers used gill nets, cast nets, basket traps, drum traps, hook and line etc. as fishing gears as their fish gear. Based on the observation from this study, it can be concluded that although the fish catch compares with other Rivers in the Niger Delta, Amasoma River is moderately impacted by its pollution status but has great potentials for fisheries exploitation if properly managed and utilized.

Keywords: Landing, fish catch, artisanal, pollution, river nun, Amassoma Axes

1. Introduction

Fish and fish products are vital and affordable sources of food and high quality protein ^[1]. Fisheries resources play an important role in the development of nations that are endowed with lots of natural freshwater ecosystems like Nigeria, since fishes are obligate aquatic organisms. Apart from being a cheap source of animal protein, fish contains essential nutrients required by the body for healthy living ^[2]. Since fish is one of the cheapest source of animal protein available to man, there is need to protect and manage them. In order for this to be realistic and effective, detailed knowledge of the water bodies and the fishers is of great importance. There are a number of growing concerns about problems with the management of fisheries resources and fishing, placing excessive strain on the water ecosystem including lakes and rivers which are major fisheries resources.

The Niger Delta is an area presently subjected to excessive exploitation and sometimes destruction of the aquatic resources through the activities of oil exploring companies. The need to conserve the depleting aquatic biota of this area has attracted the attention of researchers particularly the aquatic ecologists. Human activities over the years have continued to modify the aquatic habitat through crude oil pollution and sewage disposal. There is therefore an acute societal need to protect our water bodies and indeed the fisheries through proper management. Ironically, catch composition, frequency of size and increase or decrease in total catch are not reliable for most inland waters of Nigeria for more than two decades. Development and improved management of any country's inland water bodies must therefore start with increased knowledge of the water bodies, information on the current status of fisheries and the socio-economic characteristics of fishing communities so that people can be effectively integrated into co-management programmes ^[3],

In this regard, River Nun at Amassoma clan has received little research attention, when compared to other rivers, lakes and reservoirs in Nigeria. This research is therefore, necessary, since it seeks to provide preliminary data on the fishes catch composition, artisanal Landings and relative abundance of the species catch in the study area.

2. Materials and Methods

2.1 Study Area

The study area is River Nun Amassoma Axis in southern Ijaw L.G.A Bayelsa State, Niger Delta, Nigeria. Amassoma clan lies between latitude $5^{\circ}15'N$ and longitude $6^{\circ}5' E - 6^{\circ} 15' E$ of the equator. The source of the Amasoma River is from the tributary of Niger Delta valley and flow South-west through Tarakiri in Isampou West Ekeremor L.G.A. down to Ogbobagbene. It also channels its water to Alala-owoigbene River during the peak of the flood.

2.2 Data collection

2.2.1 Sampling Procedure

Fish samples were collected randomly from the landing of artisanal fishers. Samples were collected every month from September, 2017 to February, 2018. The gears used were seen and identified.

2.2.2 Specimen Identification

Fish specimens were identified through description checklist and keys ^{4, 5}. All the specimens were counted to determined family species abundance from the water bodies.



Plate 1: Refuse dump on River Nun at Amasoma Axes



Plate 2: fishing boats used in River Nun, Amasoma, Axes

3. Results and Discussion

3.1 Results

The results of the study are presented in Tables 1-4 and Figure 1. Table 1 and Figure 1 show the types of gear that fishers use in the River Nun at Amasoma axes. Eleven (11) types of fishing gear were identified to be used by fishers in River Nun Amasoma Axes. The variation in number of fishes species and families that the artisanal fisher's catch in the water body could be attributed to fishing methods and gears selectivity, which could also be a result of fish size and target species. (Table 1, Figure 1).

Table 1: Types of fishing gear used by fishers in River Nun, Amasoma Axis's

S/NO	Name of fishing gear	Common/Local name
1	Seine net	Sakirisa
2	Cast net	Egbor
3	Gill net	Ofonmo-dii
4	Drifting gill net	Bilemo-dii
5	Lift net	Atalla
6	Rod and Line	
7	Spring-loaded set line	Pide daye
8	Foot-hook longlines	Merimari
9	Rincha	Sarasa daye
10	Trap	Deribo-flou
11	Spears	

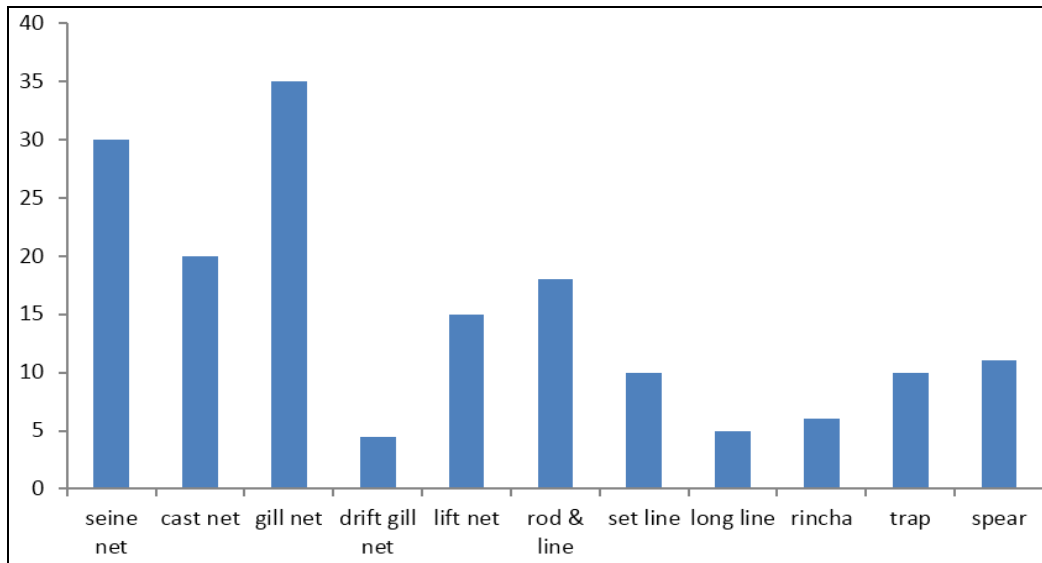


Fig 1: Fishers selectivity of gear in River Nun, Amassoma Axes

Table 2 shows the number of family and the amount of species from each family represented in the catch assessment study. Seventy two (72) species belong to twenty four (24) families were recorded. It was observed that *mormyridae* and the *mochokidae* were the families with the highest species diversity 11species each (15.27%) respectively. This was followed by the family cyprinidae with 8 species (11.11%) and the Bagridae with 7 species (9.72%). The families centromidae (1), lutjanidaea (1), elasmobranchus (1) amd malapteruridae (1) were the least abundant in terms of number of species caught. A total of 385 individuals were seen caught by artisanal fishers during the study representing 24 families and 72 species (Table 3). Table 3 shows the number of individual species and their numerical abundance. The *Tilapia* species (cichlidae) was the most dominant fish species with 30 individual (7.79%) followed by the *Synodontis resupinatus* with 12 individual (3.11%) and the *Synodontis robbianus* with 11 individuals (2.85%) while the *mormyrops deliciousus* (1) is the least abundant in terms of number of individuals. The type and frequency of the fishing gear used show that gill net>seine net>cast net>rod and line>lift net>setline>spear>trap> long line>drift gill net. This reveals that gill net was the most used fishing gear.

Table 2: Composition of families and species in River Nun Amasoma Axes

S/NO.	Name of Family	No. of Species	Percentage (%)
1	Alesitidae	2	2.77
2	Bagridae	7	9.72
3	Cetromidae	1	1.38
4	Charicidae	4	5.55
5	Cichlidae	1	1.38
6	Citharinae	1	1.38
7	Citharinoidei	1	1.38
8	Claridae	3	4.16
9	Claroteidae	1	1.38
10	Clupeidae	1	1.38
11	Cynoglossidae	2	2.77
12	Cyprinidae	8	11.11
13	Distichodontidae	4	5.55
14	Elasmobranchus	1	1.38
15	Hepsetidae	1	1.38
16	Lutjanidae	1	1.38
17	Malapteruridae	1	1.38
18	Mochokidae	11	15.27
19	Mormyridae	11	15.27
20	Notopteridae	1	1.38
21	Osteoglossidae	1	1.38
22	Pantodontidae	1	1.38
23	Schilbedae	6	8.33
24	Tetradontidae	1	1.38

Table 3: Fresh Water Fishes in River Nun, Amassoma Axes, Bayelsa State, Nigeria

S/No	Family/Scientific Name	Number	English/ Common Name	Percentage (%)
	Alestidae			
1	<i>Alestes macrolepidotus</i>	6	Silverside	1.55
2	<i>Alestes nurse</i>	2		0.52
	Bagridae			
3	<i>Bagrus bayad macropterus</i>	7		1.81
4	<i>Bagrus docmac niger</i>	8		2.07
5	<i>Bagrus filamentosus</i>	11		2.85
6	<i>Chrysichthys ocratus longifilis</i>	9		2.33
7	<i>Chrysichthys nigrodigitatus</i>	5		1.29
8	<i>Chrysichthys furcatus</i>	3		0.77
9	<i>Clarotes laticep</i>	7		1.81
	Cetromidae			
10	<i>Lates niloticus</i>	5		1.29
	Characidae			
11	<i>Hydrocymus spp.</i>	7		1.81
12	<i>Hydrocymus forskali</i>	4		1.03
13	<i>Alestes nurse spp.</i>	4		1.03
14	<i>Alestes macrolepidotus</i>	3		0.77
	Cichlidae			
15	<i>Tilapia spp.</i>	30		7.79
	Citharinidae			
16	<i>Citharinus latus</i>	9		2.33
	Citharinoidei			
17	<i>Citharinus citharus</i>	5	Moonfish	1.29
	Clariidae			
18	<i>Heterobranchus longifilis</i>	1		0.25
19	<i>Heterobranchus bidorsalis</i>	1		0.25
20	<i>Heterobranchus spp.</i>	1		0.25
	Claroteidae			
21	<i>Clarostes spp.</i>	11		2.85
	Clupeidae			
22	<i>Pellonula afzellusi</i>	8		2.07
	Cynoglossidae			
23	<i>Cynoglossus senegalensis</i>	5	Tongue sole	1.29
24	<i>Cynothrissa mento</i>	3		0.77
	Cyprinidae			
25	<i>Barbus occidentalis</i>	7	Barbels	1.81
26	<i>Labeo spp.</i>	5		1.29
27	<i>Labeo senegalensis</i>	2		0.51
28	<i>Labeo pseudocoubie</i>	2		0.51
29	<i>Labeo coubie</i>	4		1.03
30	<i>Barbus occidentalis</i>	5		1.29
31	<i>Barilius niloticus</i>	3		0.77
32	<i>Barilius loatis</i>	2		0.51
	Distichodontidae			
33	<i>Distichodus spp.</i>	7	Grass- eater	1.81
34	<i>Distichodus brevipinnis</i>	3		0.77
35	<i>Distichodus engycephalus</i>	3		0.77
36	<i>Distichodus rostratus</i>	7		1.81
	Elasmobranchs			
37	<i>Potamotrygon garouensis</i>	3		0.77
	Gymnarchidae			
38	<i>Gymnarchus niloticus</i>	8	Trunkfish	2.07
	Hepsetidae			
39	<i>Hepsetus odoe</i>	5	African pike	1.29
	Lutjanidae			
40	<i>Lutjanus spp.</i>	4		1.03
	Malapteruridae			
42	<i>Malapterurus electricus</i>	3	Electric Catfish	0.77
	Mochokidae			
43	<i>Synodontis batensoda</i>	6		1.55
44	<i>Synodontis spp.</i>	3		0.77
44	<i>Synodontis batensoda</i>	5		1.29
45	<i>Synodontis meambranaceus</i>	7		1.81
46	<i>Synodontis budgetti</i>	8		2.07
47	<i>Synodontis resupinatus</i>	12		3.11

48	<i>Synodontis robbianus</i>	11		2.85
49	<i>Synodontis ocellifer</i>	3		0.77
50	<i>Synodontis schall</i>	3		0.77
51	<i>Synodontis gambiensis</i>	5		1.29
52	<i>Synodontis gobroni</i>	5		1.29
	Mormyridae			
53	<i>Mormyrus macropet</i>	6		1.55
54	<i>Petrocephalus bane arsorgeri</i>	3		0.77
55	<i>Petrocephalus spp.</i>	4		1.03
56	<i>Mormyrops deliciosus</i>	1		0.25
57	<i>Mormyrops oudoti</i>	4		1.03
58	<i>Mormyrops engystoma</i>	3		0.77
59	<i>Marcusenius psittacus</i>	7		1.81
60	<i>Gnathonemus tamandua</i>	3		0.77
61	<i>Gnathonemus abadii</i>	6		1.55
62	<i>Gnathonemus senegalensis</i>	9		2.33
63	<i>Gnathonemus cyprinoides</i>	5		1.29
	Notopteridae			
64	<i>Papyrocranus afer</i>	2		0.51
	Osteoglossidae			
65	<i>Heterotis niloticus</i>	6		1.55
	Pantodontidae			
66	<i>Pantodon buchholzi</i>	3	Butterflyfish	0.77
	Schilbedae			
67	<i>Eutroplus spp.</i>	6		1.55
68	<i>Scilbe mystus</i>	2		0.51
69	<i>Siluranodon auritus</i>	5		1.29
70	<i>Physailia pellucida</i>	5		1.29
71	<i>Eutropius niloticus</i>	4		1.03
72	<i>Schilbe mystus</i>	2		0.51
	Tetraodontidae			
73	<i>Tetraodon fahaka</i>	2	Puffer fish or Globe fish	0.51

Table 4: Diversity of the fish in River Nun at Amasoma Clan during the study

Variables	Number
Number of family	24
Numbers of species	72
Numbers of individual	385

3.2 Discussion

The diversity of gear recorded in this study shows that the fishery of River Nun, Amassoma Axeses, Bayelsa State is a multi-species and multi-gear fishery, which indicates dynamic variation in terms of size, composition and distribution of fishes. Like this study, Abiodun and Miller [5] reported that gill nets are the most used gears in Lake Gerio. This could be because gill nets are relatively cheap, can be made locally, readily available and durable or their catching efficiency is very high. It may also be as a result of cultural biases or adaptation over time. The dominance of the Cichlidae family in the present study agrees favorably with what was reported by many other authors. This kind of dominance of the Cichlidae family was reported in Kontagora Reservoir [6]; Tiga Dam [7]; Zaria Reservoir [8]; Tagwai Lake [9]; Lower Usuma Reservoir [10] and in the West African Arid Zone Lake [11]. Their dominance could be attributed to their adaptation to lentic aquatic environmental qualities, productivity of the lake and changes in the hydrological regime of the lake [11], their high prolific breeding nature [10] coupled with their good parental care which gives a considerable advantage in the colonization of their habitat [11]. This compares favorably with the findings of [12] and [13]. *Tilapia spp* tops the cichlidae family in terms of number and weight. On the contrary, the Claridae recorded very low abundance in the river during the study period. Their very low abundance could also be as a

result of heavy exploitation which is known to cause a shift in maturity and abundance of many fishes [14]. Their low abundance could also be because of ecosystem degradation [15, 16]. Over-fishing can change species composition and abundance and has important implication on the fisheries [11, 17]. Another reason could be because they could not adapt to the hydrometeorological variables and fluctuations in the lake. Francis *et al.* [2] revealed that fish yield in Nigeria is declining due to environmental degradation and inadequate management of the fisheries resources. Allison and Okadi [18] reported relative abundance of ichthyofaunal and species diversity being influenced by variation in mesh size in the lower Niger Delta River.

4. Conclusion

This study complements previous studies on species diversity and abundance distribution in other water bodies in the Niger Delta. A total of 385 individual were caught using eleven (11) types of fishing gear by artisanal fishers during the period of study. 72 species belong to 24 families and their relative abundance was recorded.

The major investigation is the diversity and relative abundance and dominance families/species. *Cichlidae* is the largest (most dominant) among others while *mormyrops deliciosus* (1) is the least abundant in terms of number of individuals. It was observed that *mormyridae* and the *mochokidae* were the families with the highest species diversity 11species each (15.27%) respectively. This was followed by the family cyprinidae with 8 species (11.11%) and the Bagridae with 7 species (9.72%). The families centromidae (1), lutjanidae (1), elasmobranchus (1) and malapteruridae (1) are the least abundant in terms of number of species caught.

The variation in number of fishes species and families that the artisanal fisher's catch in the water body could be attributed to fishing methods and gears selectivity, which could also be a result of fish size and target species. Although the fish caught compares with that of similar water bodies in the Niger Delta, the problem of pollution on the river may have contributed to the low fish catch in the river.

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