Global Journal of Fisheries Science
Volume 6(2), pages 33-41, June 2024
Article Number: F4A1C7D83
ISSN: 2782-750X
https://doi.org/10.31248/GJFS2024.050
https://integrityresjournals.org/journal/GJFS
Full Length Research

Current assessment and classification of fishing gears and crafts deployed by fisherfolks in Oguta Lake, Imo State Nigeria

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Received 2nd April 2024; Accepted 25th April 2024

ABSTRACT: The study was carried out to examine the fishing gears and crafts used in Oguta Lake, Imo state, Nigeria. The study was conducted within the period of three (3) months (Oct 2023 – Dec 2023) to identify the major fishing gear and crafts used in Oguta Lake, to determine the socio-economic characteristics of the fisher folks, and to identify problems associated with the gear and crafts used. One of the significant problems in Oguta Lake is the widespread use of inappropriate fishing gear by local fishermen. Many fishermen continue to employ non-selective and destructive gears, such as fine mesh nets and poison substances due to the cost and expensiveness of appropriate fishing gears and crafts. The frame and catch assessment survey method was used for the study. Analytical tools used include descriptive statistics and the Likert scale. Results obtained from the study showed that gillnet was the major fishing gear used in Oguta Lake while one-man dugout canoe was the major fishing craft used. The study also showed that the majority of the fisherfolks are male (99.9%). The mean age of the fisher folks was 35 with a mean family size of 7. The majority of the fishers are not full-time fishers. The estimated income generated by the majority of the fisherfolks is N30,000 -N40,000 per month. However, overfishing, habitat destruction, regulatory challenges, pollution, unsustainable practices, socio-economic impact and bycatch were major challenges associated with the gears, while lack of suitability and stability, limited space and weight capacity are problems present with the gear. Therefore, it is recommended that the provision of loans and fishing gear to the fishers will increase productivity which will in turn increase catch. Also, the construction of a robust and stabilised planked canoe to compensate for the shortage of large dugout canoes and the unavailability of timbers is recommended.

Keywords: Crafts, fisherfolks, fishing gear, inland water, Oguta Lake.

INTRODUCTION

Oguta Lake can be categorized as a freshwater lake. It is characterized by the act of receiving perennial drainage from the Utu, Njaba and Awbuna rivers, which have their root in the Awka-Orlu in North central axis of Imo State, Nigeria. It also collects overflow from the Niger. Lake empties into the Orashi River, which is the major river positioned on the east bank floodplain of the Niger and which transports River Niger's floodwaters straight into the Niger Delta. The lake collects a huge quantity of sediment from its tributaries, especially, the Njaba, a river that is practically active and deeply incising into the badly structured soils and unconsolidated sedimentary rock (Ogwashi-Asaba Formation, Ameki Formation, and the Benin Formation) underlying the northern axis of Imo State (Ahiarakwem and Onyekuru, 2011). There are four rivers (Awbana, Utu, Njaba and Orashi) that have links with Oguta Lake (Ahiarakwem and Onyekuru, 2011).

Fishing gear can be defined as the kind of tools or equipment that is used in, cropping/harvesting, test cropping or capturing fish from any water body (Nuhu and

Yaro, 2005), while the fishing method is defined as a way in which gears are used. Moses (2002) opined that fishing gears have in overall passed through many transformations and improvements in line with advances in modern technology. However, the common principles of wounding method, hooking method, trapping method, encircling method, scooping method and filtering can still be found. NIFFR (2002) described the various designs, types and modes of operations of the modern and traditional fishing gears employed in Oguta Lake.

For efficient and effective use of any gear on a water body with success, the fisher needs a kind of mobility to enable him/her to reach both near and distant fishing grounds or markets. This brings about the acquisition of a craft. Diversity in fish species habits and habitats has led to the use of different fishing equipment peculiar to water bodies. Seasonal variations in species composition and abundance also bring about the use of specific fishing gear and craft at a particular fishing site within a particular period. Hence, fishers deploy various fishing methods, depending on the season and period of operation (NIFFR, 2002). Like fishing gear, craft has also passed through many development stages, from trunks of wood, floating calabash and papyrus rafts to woody dugout crafts, planked crafts and canoes made up of fibreglass. All these are attempts to increase the efficiency and match water conditions and types of gear engaged in fishing (Ambrose *et al*., 2001).

One of the significant problems in Oguta Lake is the widespread use of inappropriate fishing gear by local fishermen (Ohaturuonye *et al.*, 2015). Many fishermen continue to employ non-selective and destructive gears, such as fine mesh nets and poison substances due to the cost and expensiveness of appropriate fishing gears and crafts. These gears result in overfishing, high bycatch rates, and the capture of undersized fish. Such practices negatively impact the fish populations and ecological balance of the lake, posing a threat to the long-term sustainability of fisheries. Hence, in light of the above-stated problems, it is crucial to identify and understand the various fishing gear and craft currently utilised in Oguta Lake Imo state.

MATERIALS AND METHODS

The study area

Oguta Lake can be described as a lean 'finger lake' located in Oguta, Orlu agricultural zone created by the damming of the lower Njaba River with alluvium. It has been recorded as the largest natural lake in Imo State, South-eastern Nigeria, within the equatorial rainforest region of the Niger Delta. The Lake's sewarage catchment area constitutes the sewerage area of the Njaba River and a part of the Niger River floodplain in the region south of Onitsha. The lake is located in Oguta about 50 kilometers from the junction of the Orashi River and Ndoni. The length of the river is about eight kilometres long from east to west and 2.5 kilometres wide. It has latitude 5:41-5:44°N, longitude 6:41-6:50°E and and less than 50 m above sea level. The stream from Njaba River is the main inflow to Oguta Lake. The other three tributaries are Awbana, Orashi and Utu. From its southwestern portion, the Orashi River flows past Oguta Lake. During the wet season, the weather is warm while the dry season is hot, muggy, and partly cloudy in Oguta Lake. The temperature in Oguta Lake ranges from 68 to 88°F and is occasionally below 60°F or above 91°F. The most suitable time of year to visit Oguta for hot-weather activities is from late November to late January based on the beach pool score. The lake is of benefit to the people of Njaba blessed with oil in their river basin and a major source of fish biodiversity, water tourism and a drainage outlet.

Sampling technique and plan

The essence of sampling is to get a fair representation of the whole population. The sampling technique used to select respondents for the study was both purposive sampling and stratified sampling technique.

Method of data collection

Frame survey was used to collect data as described by Elliot *et al.* (2014). This is a standardized survey method which includes stratification and classification. Data were also collected from primary sources from the field through direct observation, the use of questionnaires which were structured based on the specific objective of the study and interviews scheduled to collect information from those who are not educated, while the questionnaire was used to collect information from those that are educated.

Data on the different types of fishing gear and crafts used for fishing activities in Oguta Lake was collected. Data on the socio-economic factors affecting fisherfolks such as age, sex, marital status, household size, educational attainment other activities and years of experience were also collected. The data collected were subjected to descriptive statistics, mean, percentage, bar chart and Likert scale.

RESULTS

Figure 1 shows that 90.9% of the respondents were male and 9% were female. This implies that a greater percentage of the fish farming population in Oguta Lake were males. Figure 2 shows that the greatest percentage (54.6%) of the respondents were in the age category between 31 and 40, while the least (3.6%) were those who

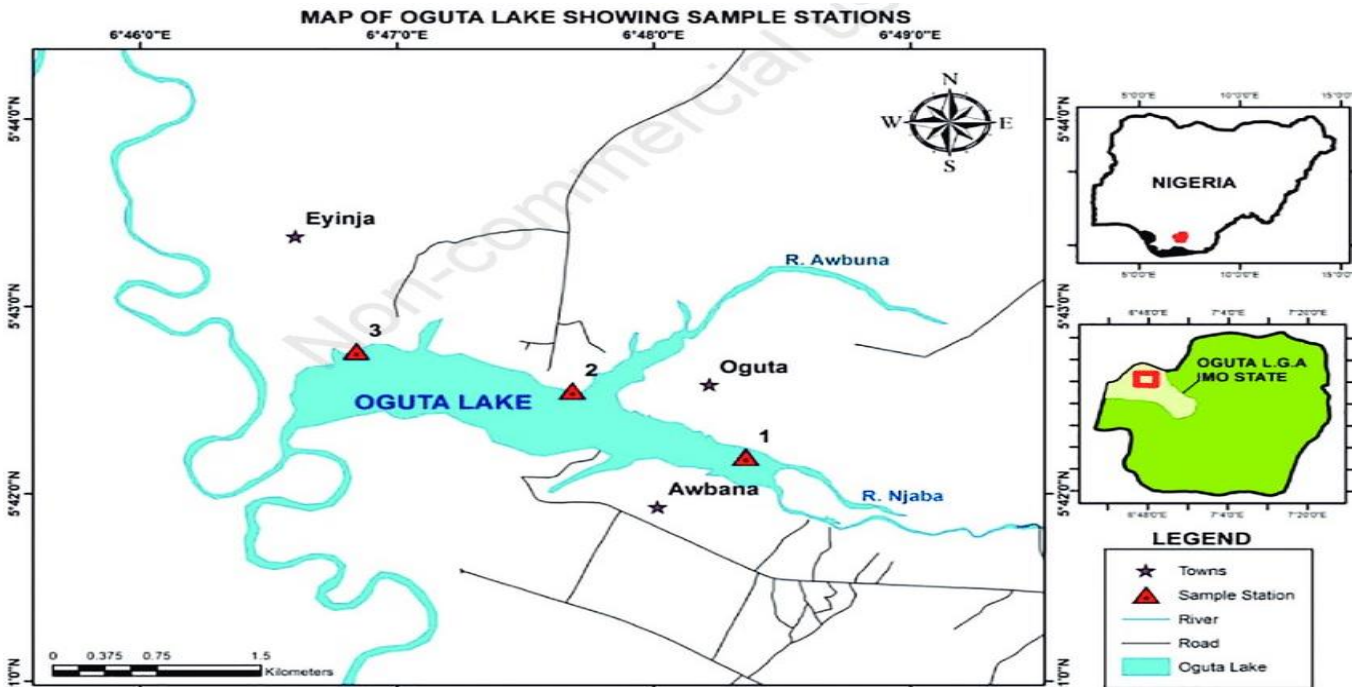

Plate 1. Map of Oguta Lake.

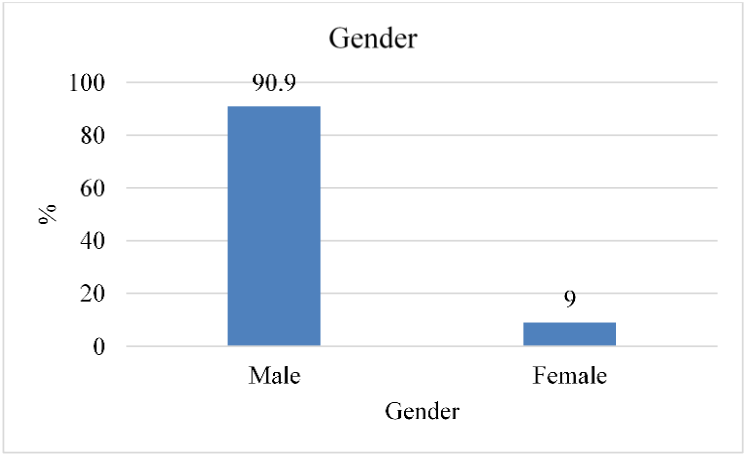

Figure 1. Distribution of respondents according to gender (Source: Field Data, 2023).

were greater than 50 years of age. The mean age is 35 suggesting that most of the respondents were in their active working age. At this mean age of 35, they were expected to be articulate. Figure 3 shows that the greatest percentage (45.5%) of the respondents were married while the least (3.6%) were divorced. Marital status is one of the important factors affecting the level of productivity in agriculture since the highest percentage of married people provide cheap labour. Figure 4 shows that the majority (47.3%) of the respondents have household sizes between 1-4 persons while the least (7.2%) of the respondents were those that have households greater than 12. The average size of the household was 7. Figure 5 shows that 16.4% of the respondents do not have any formal education, 20% attended primary school, 49.1% attended secondary school education and 14.5% attended tertiary education. The highest percentage (49.1) means that the majority of the population is predominantly literate. Education is an important variable because it enables individuals to gain knowledge and skills. Figure 6 shows that a greater number of the respondents have a good fishing experience. Since experience is one of the factors that

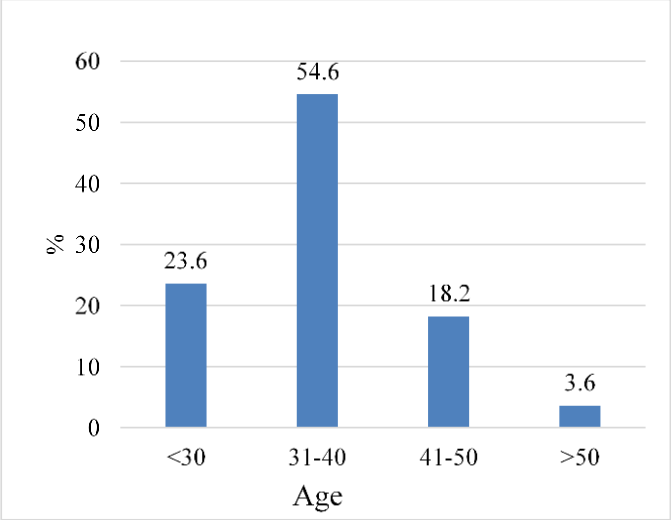

Figure 2. Distribution of respondents according to gender (Source: Field Data, 2023).

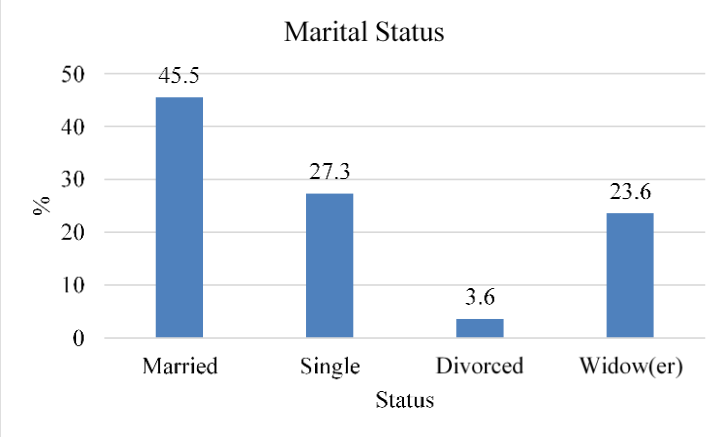

Figure 3. Bar chart showing the marital status of the fishers in Oguta Lake (Source: Field Data, 2023).

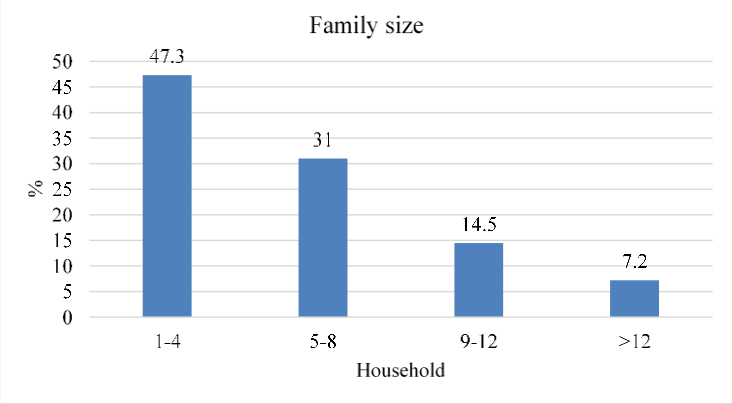

Figure 4. Bar chart showing the household of the fishers in Oguta Lake (Source: Field Data, 2023).

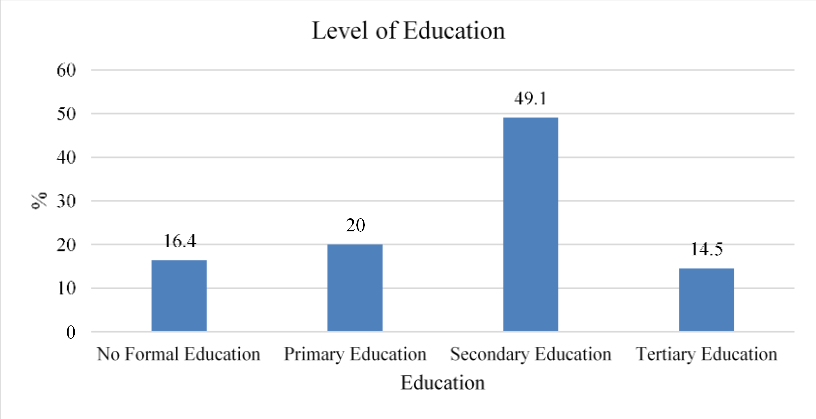

Figure 5. Bar chart showing the level of the fishers in Oguta Lake (Source: Field Data, 2023).

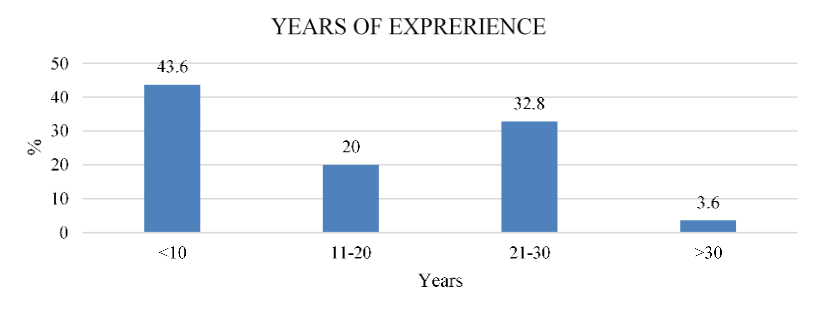

Figure 6. Bar chart showing years of experience of the fishers in Oguta Lake (Source: Field data 2023).

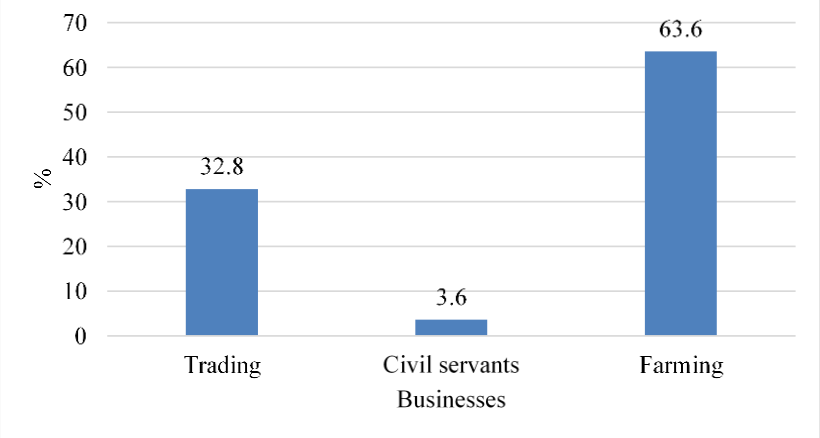

Figure 7. Bar chart showing other businesses engaged by fishers in Oguta Lake (Source: Field data 2023).

improve one's knowledge and skill, it now implies that they have acquired enough skills and knowledge in capture fisheries. Figure 7 shows that 35 respondents representing 63.6% of the respondents embarked on other businesses such as farming, 18 respondents representing 32.8% were traders and 3.6% were civil servants. Figure 8 shows that none of the fishing gears and crafts used for fishing in Oguta Lake were crafted locally by the fisher folks. All 55

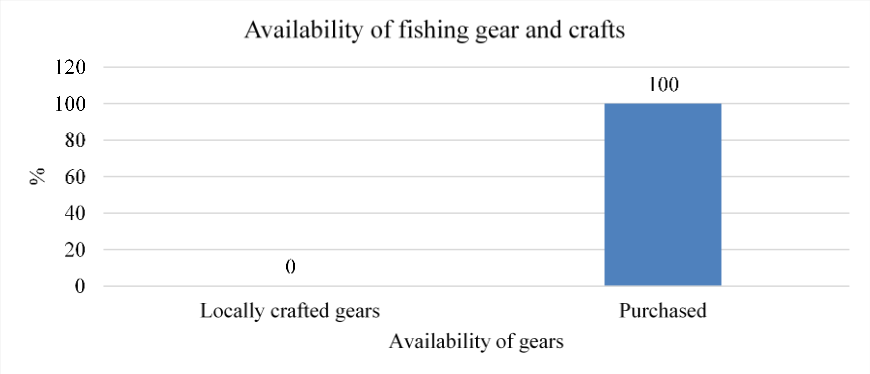

Figure 8. Bar chart showing the availability of fishing gear in Oguta Lake (Source: Field data 2023).

Figure 9. Bar chart showing the monthly income of fisher folks in Oguta Lake (Source: Field data 2023).

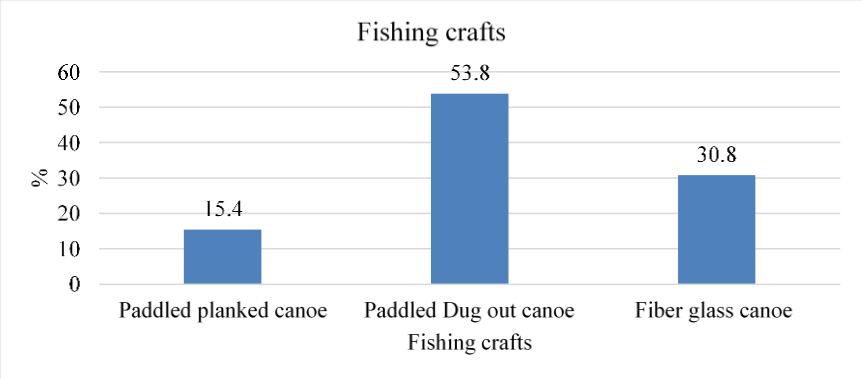

Figure 10. Bar chart showing the Distribution of the fishing craft used in Oguta Lake (Source: Field data 2023).

respondents were able to purchase all the gear and craft they needed for fishing. Figure 9 shows that none of the respondents earn less than 10000 per month, 9.09% of the respondents earned between 10,00-20000 per month, 25.5% of the respondents earned 20000-30000 per month, (5.45%) of the respondents earned 40000-50000 per month, 5.45% earns 50000-60000 per month while (10.91%) earn 60000 and above. Figure 10 shows that the

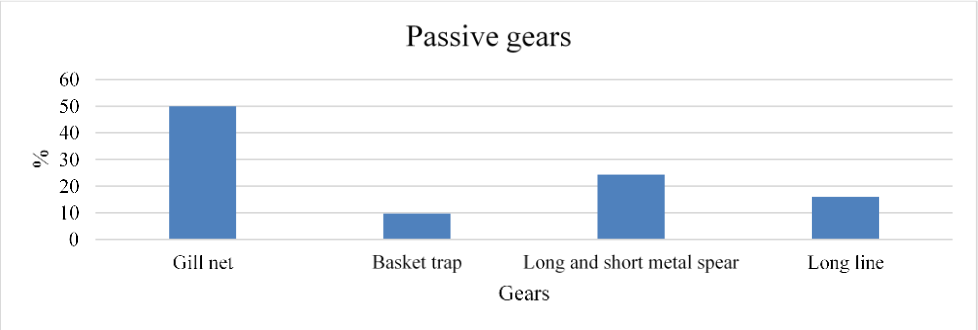

Figure 11. Bar chart showing the distribution of the passive gears (Source: Field data 2023).

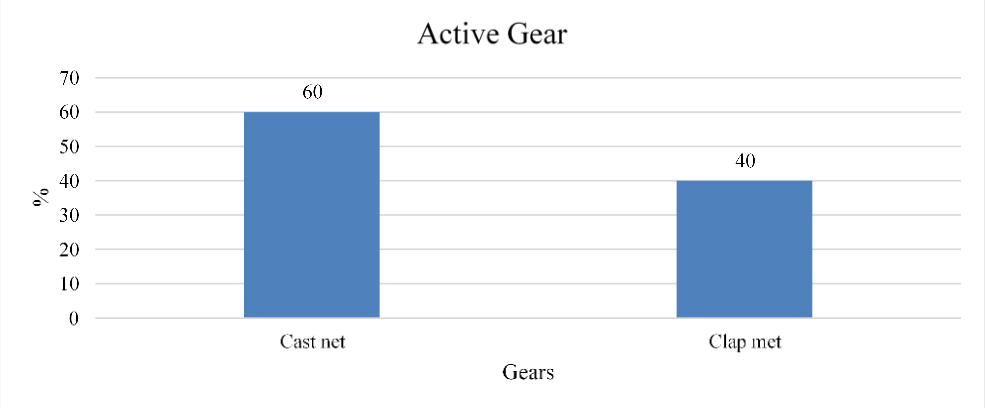

Figure 12. Bar chart showing the distribution of active gears (Source: Field data 2023).

dominant fishing craft used in Oguta Lake is a paddled dug-out canoe with a percentage of 53.8, followed by a fibreglass canoe with 30.8% and then paddled a planked canoe with a percentage of 15.4. Figure 11 shows that the major passive gear used in Oguta Lake is gill net (50%), followed by long and short metal spear (24.3%), long line (17.1%) and then basket trap (9.7%). Figure 12 shows that the major active gears used are cast net (60%), followed by the clap net which accounts for the other 40%. Figure 13 shows the challenges\problems associated with the fishing gear and crafts used in Oguta Lake. Over-fishing with a mean score of 5.0 was strongly agreed by the majority of the respondents as the major challenge, followed by habitat destruction with a mean score of 4.6, Bycatch with a mean score of 4.2, unsustainable practices with a mean score of 3.5 was seen as neutral by the respondents. Others include pollution (2.5), social-economic impacts (1.9) and regulatory challenges (1.5) were the least challenges encountered by the respondents. Figure 14 shows the challenges associated with the fishing crafts. Vulnerability of the boat with a mean score of 5.0 was strongly agreed by the respondents, followed by limited weight and space capacity with a mean score of 4.5 then lack of durability with a mean score of 4.0.

DISCUSSION

The inland fishery of Nigeria can be characterized as artisanal with multi-species and multi-gear activities. Fishermen in Nigeria make use of gears and crafts made from both synthetic and natural materials. Nigerian fishermen make use of about twenty-seven (27) different types of fishing gear (Udolisa *et al.,* 2013). The result of the percentage of fishing crafts found in Oguta Lake as presented in Figure 10 shows that the majority of the fishermen used dugout canoes (58.3%), followed by planked canoes (45.5%) and fibreglass canoes (30.8%). This shows that a greater number of fishermen in Oguta Lake use dugout canoe for fishing which is usually propelled by the use of paddles. These findings are also similar to the findings of Ohaturuonye *et al.* (2015) who opined that the dugout canoe is the major fishing craft used in Oguta Lake. The fibreglass canoes are mainly used to convey people across the lake.

The results from this study also correspond with the findings of Ohaturuonye *et al*. (2015) who reported that gill net is the major fishing gear used by fishermen in Oguta Lake. The use of gillnet was also reported by Ohaturuonye *et al.* (2015) who opined that the dominance of gillnet use may be attributed to the ease of use and low cost of

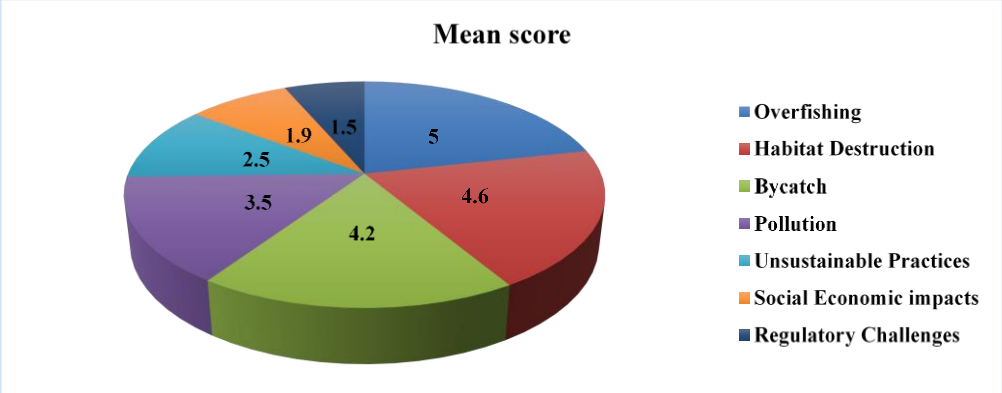

Figure 13. Pie chart showing the means score of challenges associated with the fishing gears used in Oguta Lake (Source: Field data 2023).

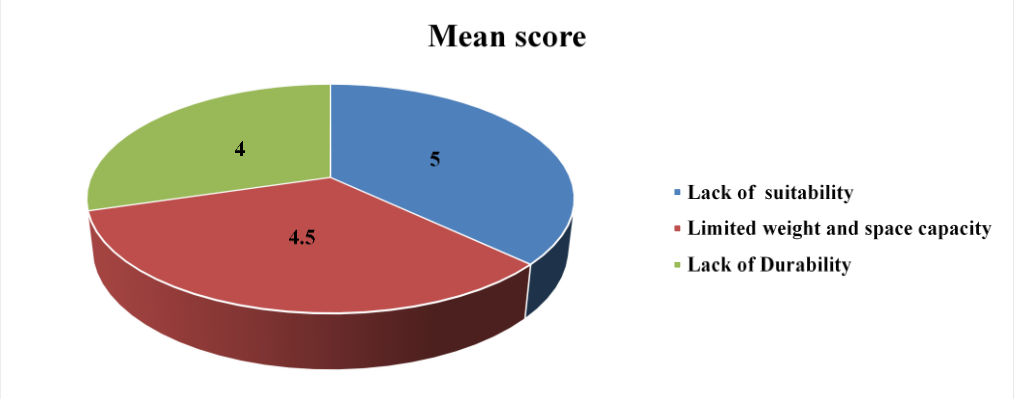

Figure 14. showing the mean score of these challenges associated with the fishing crafts (Source: Field data 2023).

maintenance. Similar to the report by Olopade and Dienye (2018) who concluded that gillnet is the major gear used in the new Calabar River for the exploitation of all fish species of maximum potential and sizes. The gear was also reported in Kainji Lake (Du Feu *et al.*, 2007) and Lake Alua (Bankole *et al*., 2010). The abundance of gillnet observed may also be a result of lack of mesh size regulation which has encouraged the introduction of different mesh sizes leading to overfishing observed in the area. This was also the case in the finding of Tagago *et al.* (2011). Figure 11 and Figure 12 show the classification of the fishing gears in Oguta Lake based on passive and active gears. The result obtained shows that passive gears (41) are used more than the active gears (25) by the fishers in Oguta Lake.

The result from the study also shows that the majority of the fisher folks are male (99.9%) and mean age of 35. Age is an important variable that influences people's attitudes, skills and aspirations. The highest percentage of the respondents are married (45.5%) which implies that the majority of the fishers shoulder family responsibility. 49.1% of the fisher folks are literate with a family size of 1-4. The size of the household is an important factor that determines how cheap the labour is. It is to be noted that those with higher household sizes will provide cheaper labour than those with small households. The average years of experience is 16, majority of the fisher folks embark on farming as a side source of income, hence, most of the fisher folks are not full-time fishers. The estimated income generated by the majority of the fisher folks is <45000 per month. The results from the study are similar to the findings of Aminu *et al*. (2017) who reported that fishing was dominated by males with a mean age of 39 years, educated and married with a family size of 1-3.

From this study, the major problems associated with the identified fishing crafts such as the planked canoe and the dugout canoe is their lack of suitability and stability which makes them more susceptible to capsizing especially in rough waters or adverse weather conditions. Another problem stated is the limited space and weight-bearing capacity restricting the amount of gear catch and the amount that can be carried. The construction of more

robust planked canoes to compensate for the shortage of large dug-out canoes which is due to the non-availability of timbers to increase the deck walking space (Emmanuel, 2010). The boat's vulnerability and insufficient durability, stemming from the wooden construction of the plank and dugout canoe, also present a problem. This was also reported by Emmanuel (2010) who stated that some of the canoes in Lagos Lagoon generally tied to the planked jetties are left in water throughout the year, causing the wood to absorb water infested with algae such as spirogyra species which add more weight and eventually reduce the speed of the canoe when propelled and consequently weakens the wood adding to leakage and causes damage to the canoe. Further findings of the study revealed that the major challenges associated with the identified fishing gears include overfishing (5), habitat destruction (4.6), bycatch (4.2), pollution (3.5) unsustainable practices (2.5), social-economic impact (1.9), and regulatory challenges (1.5).

Conclusion

The present study revealed arrays of fishing gear in use (gill net, cast net, basket trap, long and short metal spear, long line) and crafts (planked canoe, dugout canoe and fibreglass canoe) in Oguta Lake. Gillnet was identified as the major gear used while dugout canoe is the major craft in use. The majority of the fishers are literate married men of an average of 35 years who are still in their active working years and the majority are not full-time fishers, they have other businesses they engage in such as farming and trading. However, if challenges such as overfishing, pollution, habitat destruction, regulatory challenges and unsustainable practices were tackled, fishing would be lucrative and many would want to invest in fish production through fishing.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Provision of loans and fishing gear to the fishers to increase productivity which will in turn increase catch. Also, the construction of robust and stabilised planked canoes to compensate for the shortage of large dugout canoes due to the unavailability of timbers.
2. Adequate management practices about gear and mesh size regulation should be adopted to guide against the increase in overfishing in the water.
3. The natural water bodies should be restocked so that fishers do not toil at times all day without a catch and also to prevent some important species from extinction.
4. Women's participation in fishing activities should be encouraged by the community and the government.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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