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Fishery of Ajoki Creek, Benin River, Edo State, Nigeria

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ABSTRACT

A preliminary study was carried out to determine the fishery of the Ajoki Creek in the Ikpoba-Okha Local Government. Area of Edo State. Fishery activities on the river were ascertained by administration of questionnaires to a randomly selected group of persons. The data were analyzed using descriptive statistics. Results revealed fishing as the predominant economic activity, 70% of fishers fishing full time and 30% part time. The fishery was artisanal as wooden dug-out canoes, and traditional gears were predominantly used. There was active participation of male and female fishers although at a ratio of 3:2. Also, fishers were predominantly youths, with 40% females within age grades of 18-50 years and 60% males within age grades of 18-60years. Catch per landing per day for most fishers recorded varying fish sizes, but a predominance (32% – 48%) of large sized (41cm – 80cm) fish. The daily income of the fishers was good, with 35% getting ₦ 25,000 to ₦ 50,000 daily and 30% getting ₦ 50,000 and above daily.

Keywords: Ajoki, Fishers, Fishery

INTRODUCTION

The Ajoki Creek is located in front of the Ajoki community of the Ikpoba – Okha Local Government Area of Edo State. The Ajoki creek is an economically important Creek as it is the source of Oil and Gas deposits owned by the Ajoki community, one of the leading oil producing communities alongside the Ajamimogha, Kolokolo, Ajatiton and Ikara, in Edo State (Okpanefe *et al*.,1991). The locals of Ajoki community are Itsekiri speaking people with traces of Ijaw and other ethnic groups within. The environment of the community is rich in hydrocarbon and therefore a host to major oil exploration companies such as Nigeria Petroleum Development Company (NPDC) amongst others (Imasuen *et al*, 2014). It has been severally reported that exploration of hydrocarbon which is the mainstay of the country's economy has been a major environmental pollutant in the Niger – Delta region of the country (Imasuen and Omorogieva, 2013), as a result of oil spillage and gas flaring resulting in environmental degradation, water contamination among others, that adversely affect the river, the fish fauna, and the livelihoods of the inhabitants of the communities where exploration of hydrocarbon is carried out (Imasuen *et al*, 2017).

Fishery can be defined as "an entity engaged in raising or harvesting fish as determined by some authority", such as the Food and Agriculture Organization (FAO) (Fletcher, *et al.*,2002). The exploitation of artisanal fisheries is importatnt because it provides a cheap source of protein. Artisanal and Industrial fisheries is known to play a very significant role in the national economy in Nigeria, with industrial fisheries serving as a source of foreign exchange (Sikoki and Otobotekere, 1999). Abowei and Hart (2008) reported that, fisheries is known to generate about 20 million dollars annually through the export of shrimps alone. Fisheries also provides good incomes for local fishers, as the demand for fish far outstrips the supply,

and it provides jobs also for rural dwellers . Abowei and Hart (2008) added that, fishery also provided direct and secondary employment to more than one million Nigerians. Despite the importance of the Ajoki Creek as an oil and gas bearing aquatic environment, and the common knowledge of the problems faced by local fishers in oil producing riverine communities in the Niger Delta Area, there is paucity of information on the status of the fishery activities in this Creek. This work therefore is targeted at providing baseline information for the Fishery of the Ajoki Creek.

MATERIALS AND METHODS

Study Area

The study area is the Ajoki creek, a tributary of the Benin River which flows between Delta and Edo States (Figure 1), and mainly flowing in front of the Ajoki Community of Ikpoba– Okha Local Government Area in Edo State. The Ajoki community is situated is within coordinate 06° 05'00"N and 05° 25'00"E, at the border between Edo and Delta States (Imasuen *et al*., 2014). It is also in the vicinity of the Gele-gele forest reserve which lies within latitude 5° 55' and 6 09' N and longitude 50° 16' and 50° 27' E, in Edo state, Nigeria (Mmom, and Mbee, 2014).

Information from the natives (*Personal communication*) and observations revealed that, the Creek is wide and deep in the main channel, breaking, landwards into fresh water swamps in the forest areas. It was also reported to be tidal, with a moderate flow rate. The vegetation around the area is a dense variation of aquatic and terrestrial macrophytes of various sizes and species and some submerged aquatic plants. The Creek water is a black water, and the soil has a combination of black humus soil, probably from decayed vegetation and some white sand. The turbidity is high, probably due to the River channel being busy with boats and badges that were driving through it and lumbering. The Creek is of great economic importance as it is a source of transportation for loggers and persons, as well as a source of fish food for the communities around it in both Edo and Delta States of Nigeria. It is also important as the Ajoki community is an important Oil producing Community for which the Edo state has been recognized as an Oil bearing area of Nigeria.

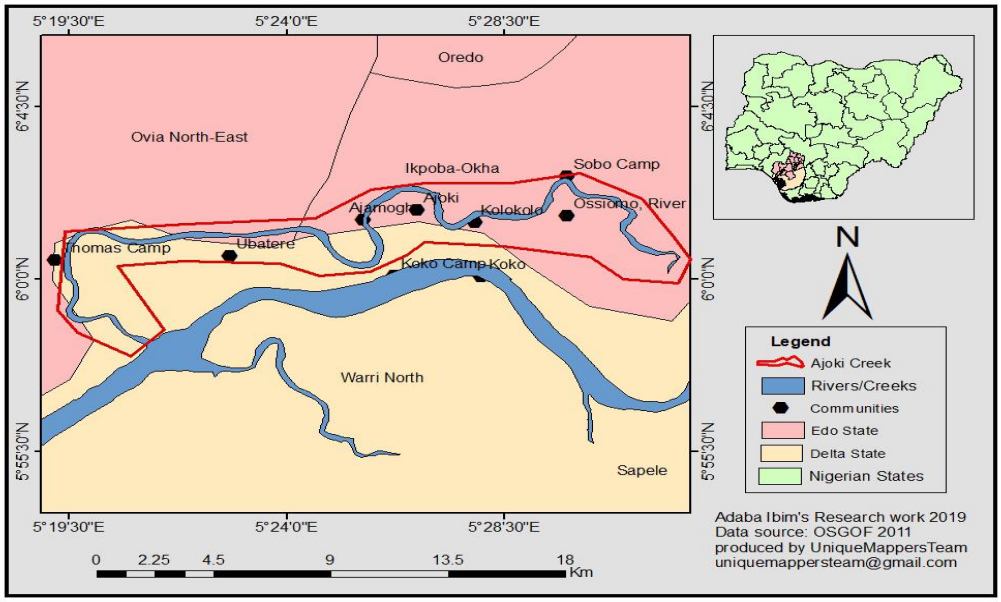

Fig. 1. Map of the Ajoki Community showing the Ajoki Creek

Sources of Data, Data Collection, and Analysis.

The simple random sampling technique was employed to pick a representative population of 80 persons in the small community of Ajoki, existing around the Creek. The study used multistage sampling techniques. The first stage involved random selection of a total of 80 respondents from the community. Primary data were generated using structured, questionnaire. The questionnaire dealt with the demographic data of respondents (sex, age, and occupation). This was followed by relevant questions for those identified as fishers, types of fishing gears and the fishes caught, fish sizes and numbers caught, and average daily income from exploitation of fish. The randomly selected group of locals were gathered together, and the structured questionnaires administered to them for the data collection. In a situation where the respondents could not read or write, personal interviews were carried out and the responses were entered into the questionnaires. The data acquired from the respondents was analyzed using descriptive statistics.

The categories of data for the study were; Occupation/Economic Activities, Fishing type, Fishers' Sexes, and Age distribution, Fishing Activities (fishing vessels and fishing gears), Fishers' daily catch, and daily incomes.

Data Analysis

The data collected from the respondents were subjected to analysis using descriptive statistics.

RESULTS

Occupation/ Economic Activities

The occupation/economic activities of the natives in the study area (Figure 2) revealed fishing, transportation, wood logging, trading, hunting and small scale aquaculture as the occupations in the study area. However, fishing was the predominant economic activity as a majority of the respondents were fishers. They recorded the highest percentage (40%) participation by the people and was carried out daily. Farming is next in terms of participation with 30% of the respondents depending on it for their livelihood, Other economic activities included transportation (5 %), wood logging (10 %), trading (9 %), hunting (5 %) and small scale aquaculture (1%).

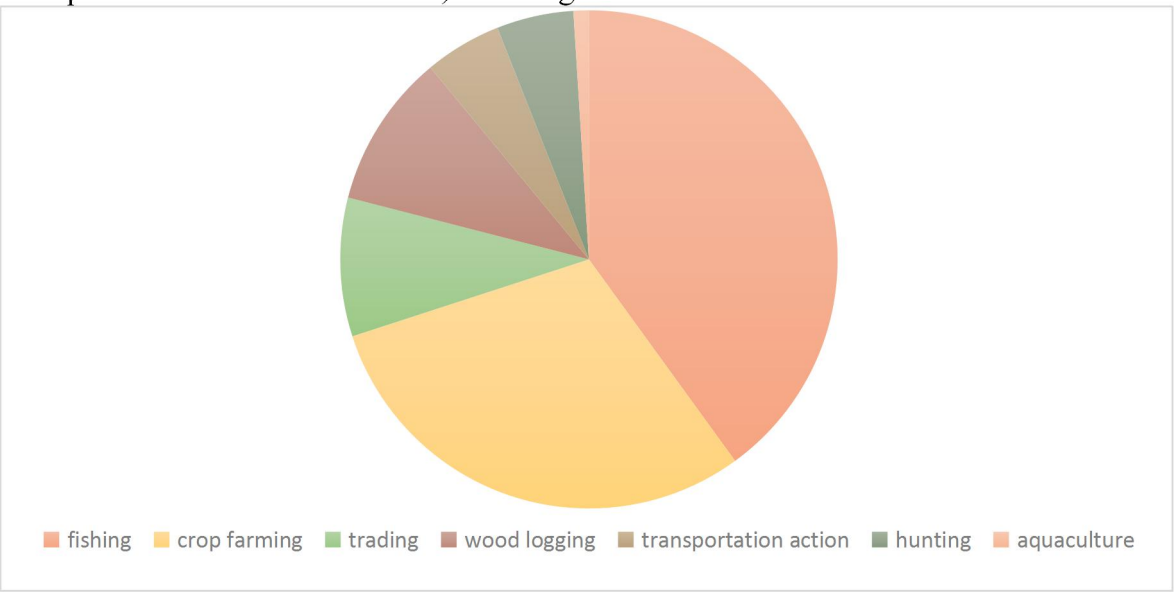

Fig. 2. Distribution of Respondent Based on Occupations/Economic Activities in Ajoki Creek, Nigeria.

Types of Fishing

Distribution of respondents based on types of fishing, whether part time or fulltime in the community (Figure 3) showed that, a higher percentage of respondents engaged in fishing fulltime (70%), fishing once or twice daily, while a lower percentage (30%) engaged in part-time fishing, fishing once a week.

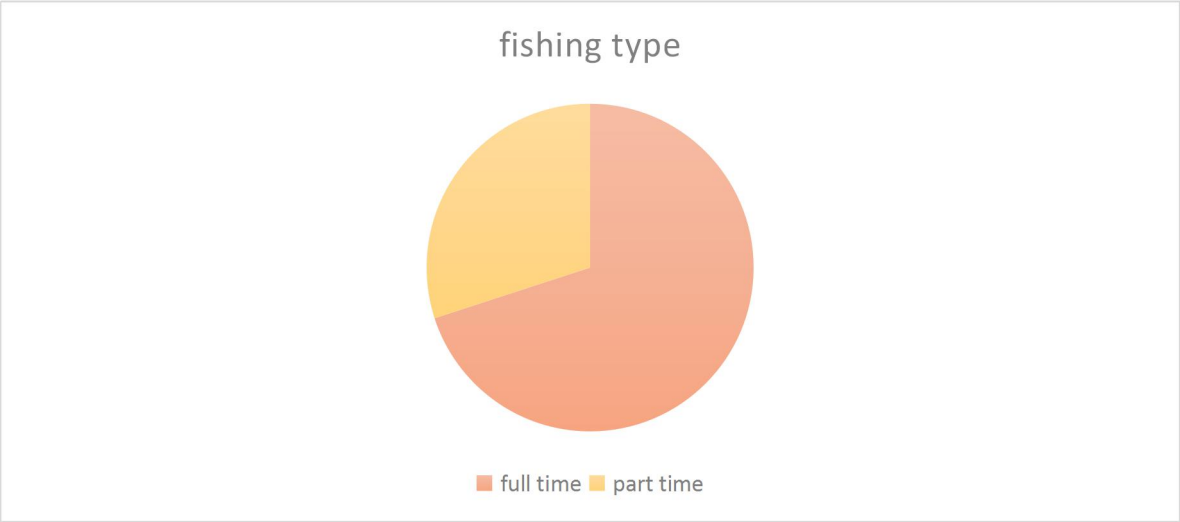

Fig. 3. Distribution of Respondents Based on Types of Fishing in Ajoki Creek, Nigeria.

Sex of Fishers

Both males and females are actively involved in fishing (Figure 4). However, majority of the fishers were males while few were females. The proportion of male to female fishers is 3:2.

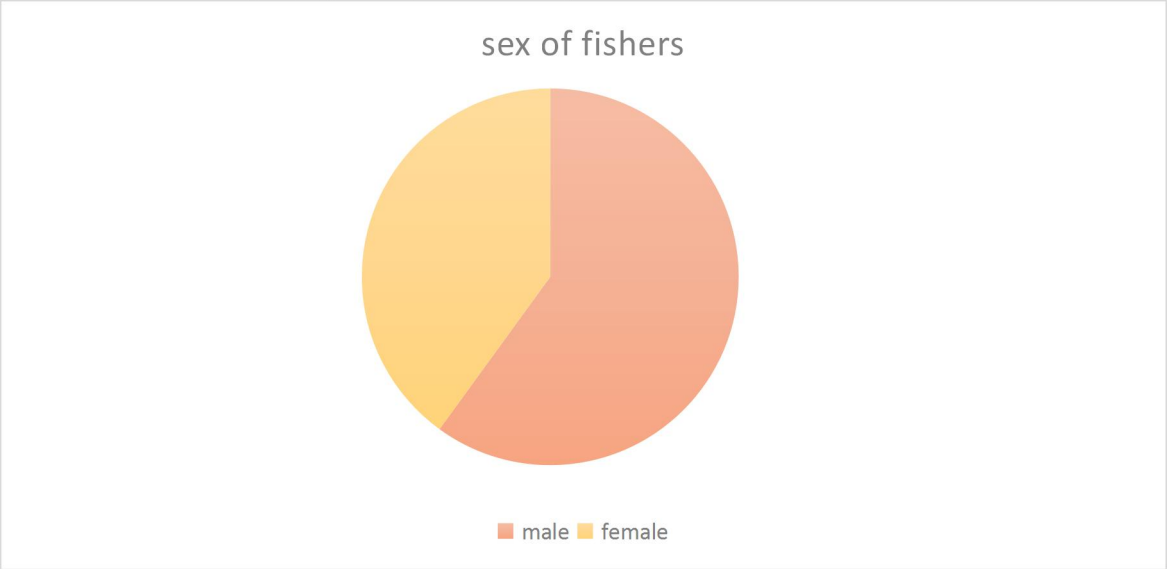

Fig. 4. Distribution of Respondents, Based on Sex of Fishers in Ajoki Creek, Nigeria.

Age distribution of fishers

The age distribution of female and male fishers (Figure 5) revealed that, all female fishers were between 11 and 50years whereas, all the males were between the ages of 11 and 60years. However, a majority of female fishers (48% and 22%) and (35 and 30%) for males sexes were between the ages of 31-40 and 41 – 50, respectively.

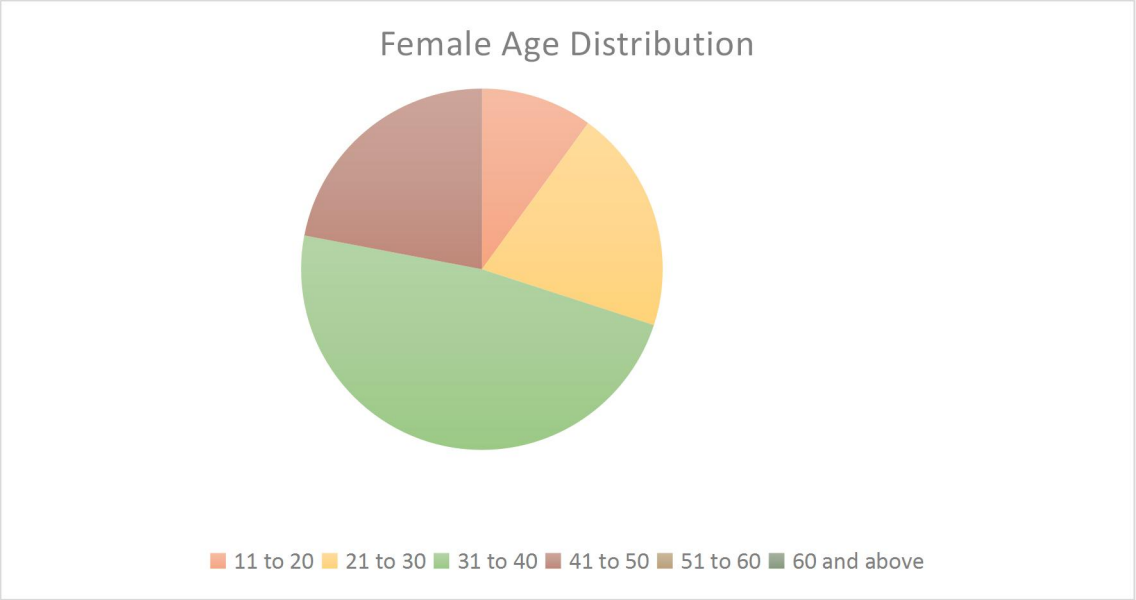

Fig. 5a. Age Distribution of Female Fishers in Ajoki Creek, Nigeria.

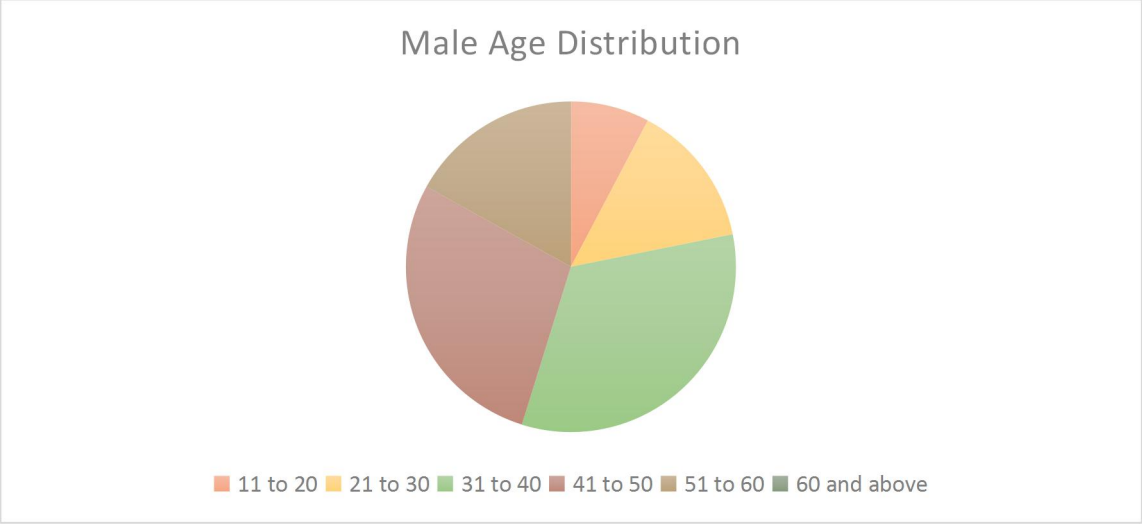

Fig. 5b. Age Distribution of Male Fishers in Ajoki Creek, Nigeria.

Fishing Vessels

The fishing activities in the study area was observed to be dominated by small scale fishers in the creek. The fishers used mainly wooden dugout canoes that come in different sizes. Some of these wooden dug-out canoes were motorized while others were not motorized, but used paddles. Another form of fishing vessel employed was the fiberglass boat, fitted with an out-boardengine.

Among the fishers (Figure 6), 30% were found using the wooden dug-out canoes with outboard engines, while 68% were using wooden canoes without outboard engines, and a minute group of fishers (2%) used fibre-glass boats with outboard engines. The method of fishing practiced in the area was primarily the artisanal fisheries.

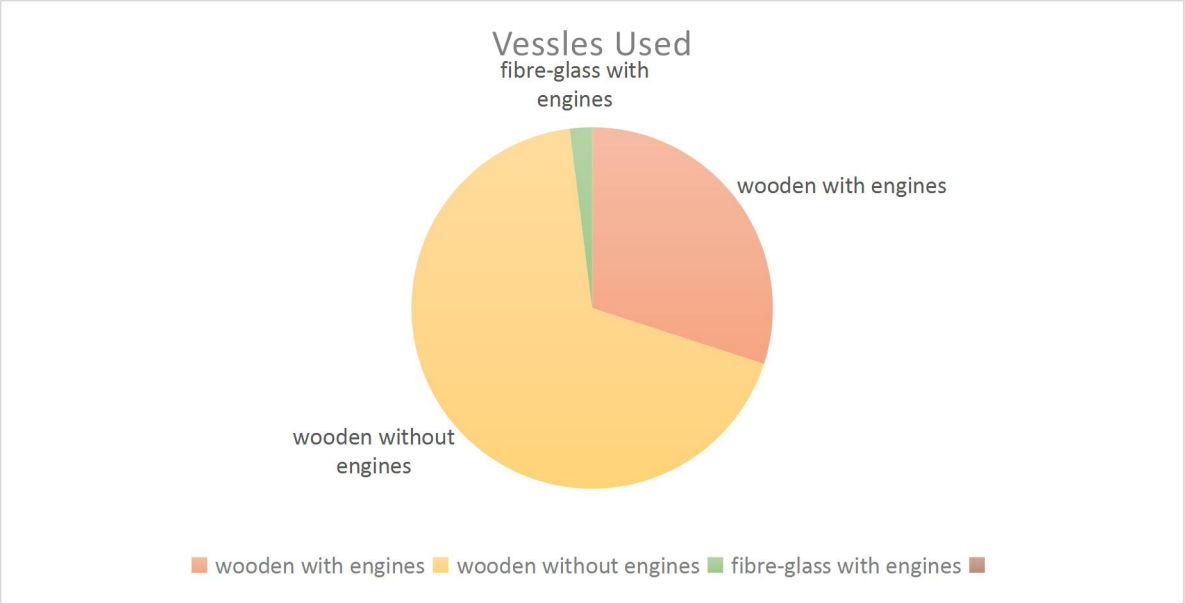

Fig. 6. Distribution of Respondents Based on Fishing Craft Type in Ajoki Creek, Niger Delta, Nigeria.

Fishing Gears and their uses

The fishing gears of the area varied widely in types, shapes and sizes. The different types of gears (Table 1) consisted of nets and traps. The nets were namely; cast nets, gill nets, long lines, hook and line, circling nets and seine nets. The mesh sizes of the different nets also were of different sizes (5mm, 10mm and 15mm). Traps used include: basket traps, non-return valve traps of different types and sizes, and pole and hook traps. The non-return valve and basket traps were used in the creek for fishing non-finfishes.

The gears were made from local materials and manually operated, and so were traditional gears. The gears commonly used in this community were said to be dependent on the fish species being sought for, their sizes, the location of the fishes (creek or swamp), the feeding mode; affordability of gear, ease of use and age of fisher, among others.

Table 1: Fishing Gears and the fish species targeted in Ajoki Creek Fishery, Ajoki, Ikpoba-Okha LGA, Edo State, Niger Delta, Nigeria

Gears Types	**Sub-Types**		**Fish Types Caught**
Nets	i.	Cast nets	*Gymnarchus niloticus Trichiurus* Sp.,
	ii.	Gill nets	*Epetocheithys calabaricus, Trichiurus Sp,*
	iii.	circling nets,	
	iv.	seine nets	*Heterobranchus longifillis, Clarias gariepinus, Protopterus annectens, Hydrocynus forskalii, Hemichromis Spp., Oreochromis niloticus,*
	v.	Hook & line,	*Serotherodon melanotheron*
	vi.	long lines,	
Traps	i.	non-return valve traps	*Hemichromis Spp., Oreochromis niloticus, Serotherodon melanotheron Shellfishes, eg Prawns (Macrobrachium vollenhovenii and M. macrobrachion),* and small *Clarias* sp, and other small fishes
	ii.	basket traps	*Heterobranchus longifillis, Clarias gariepinus, Protopterus annectens, Hydrocynus forskalii*
	iii.	pole and hook traps	

The gears used by male and female fishers **(**Figure 7), revealed that, the males operated all the different types of gears with the exception of the basket traps. They mainly operated the heavy gears; nets (cast nets, seine nets, gill nets, circling nets), and hook bearing gears (the long lines and hook and line), used in the main water body of the creek, that enabled them to catch larger fishes. The female fishers used mainly light traps especially the basket traps but sometimes they used long lines and gill nets for small fishes. They exploited shellfishes (*Macrobrachium vollenhovenii* and *M. macrobrachion*) by using light traps such as basket traps operated mainly by female fishers. Basket traps were the gear of choice in the swamps and in the flooded grasslands and were therefore particularly effective for exploiting *Clarias* sp.

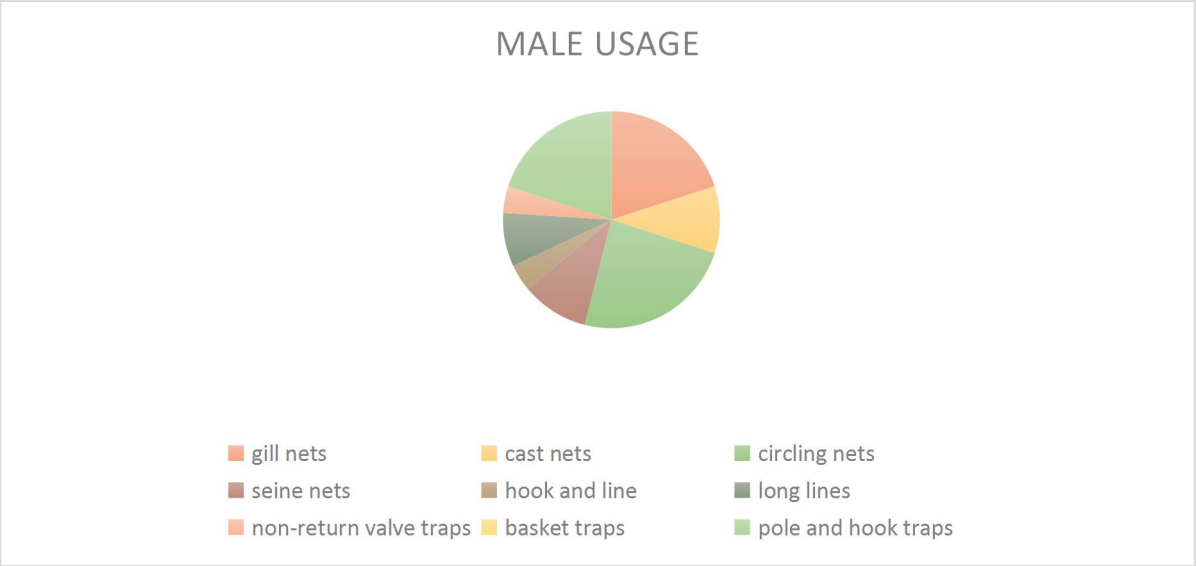

Fig. 7a. Distribution of Male Respondents on Type of Fishing Gears in Ajoki Creek, Nigeria.

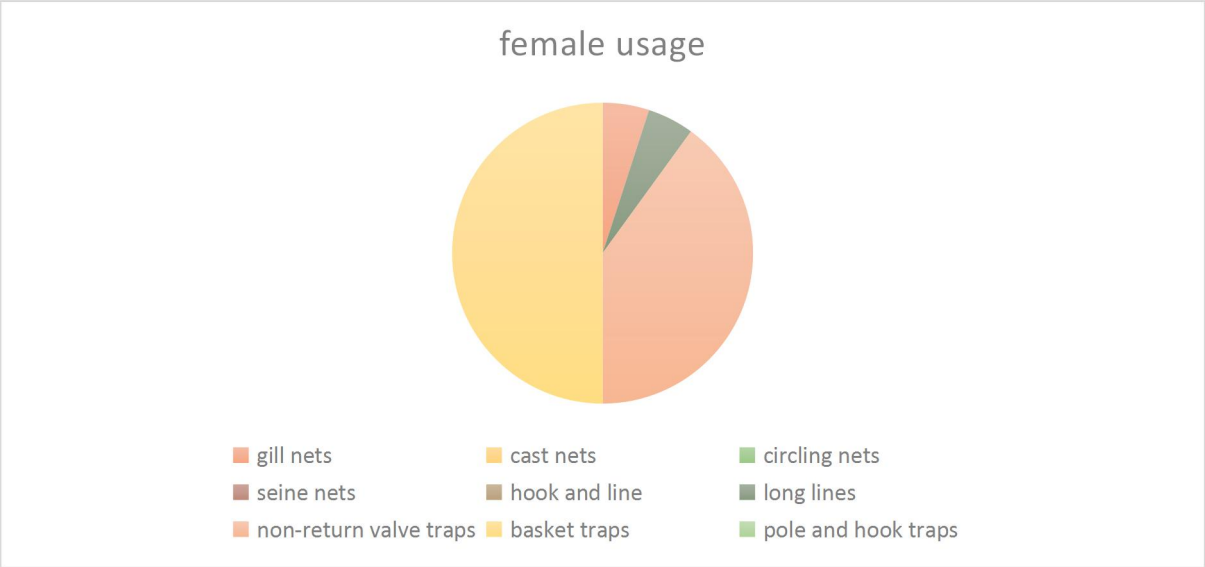

Fig. 7b. Distribution of female Respondents on Type of Fishing Gears in Ajoki Creek, Nigeria.

Assessment of Fish Catch

The fish catch in the study area (Figure 8), showed that 9% of fishers caught 1 – 20cm fishes (small sized), 11% caught 21-40cm, whereas, the largest population of fishers (48%) caught larger fishes (41cm – 61cm). This reveals that most fishers catch 41cm upwards of varying various species of fishes.

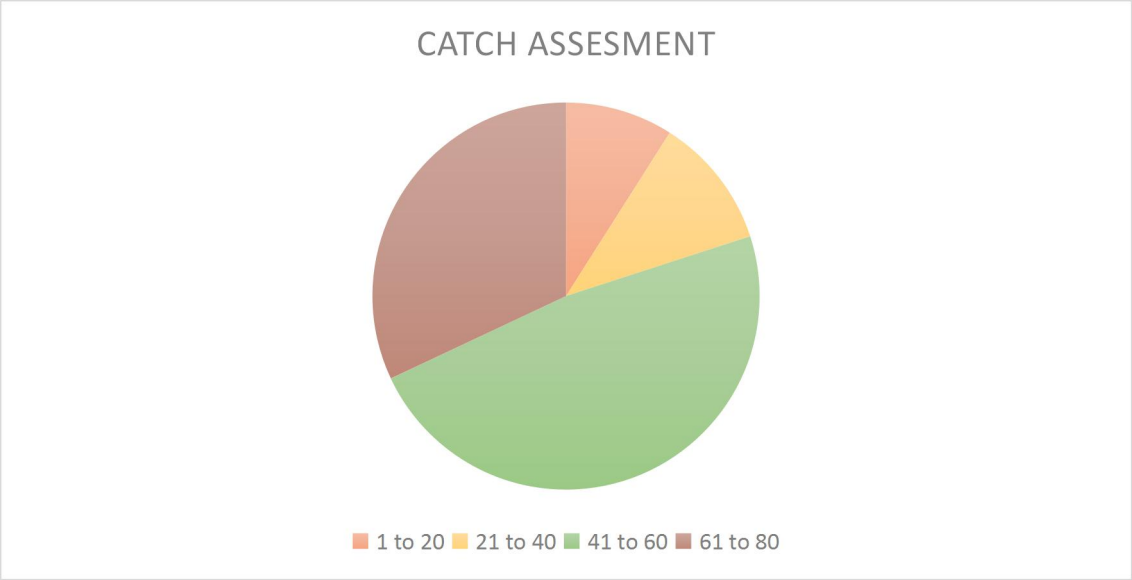

Fig. 8. Distribution of Respondents Based on the Fish Catch at Ajoki Creek, Nigeria

Assessment of the Average Daily Income

The average daily income of the Ajoki fishery (Figure 9) revealed that 10% of fishers earned between ₦100-5000 daily, whereas a higher percentage (30%) earned N50,000 and above.

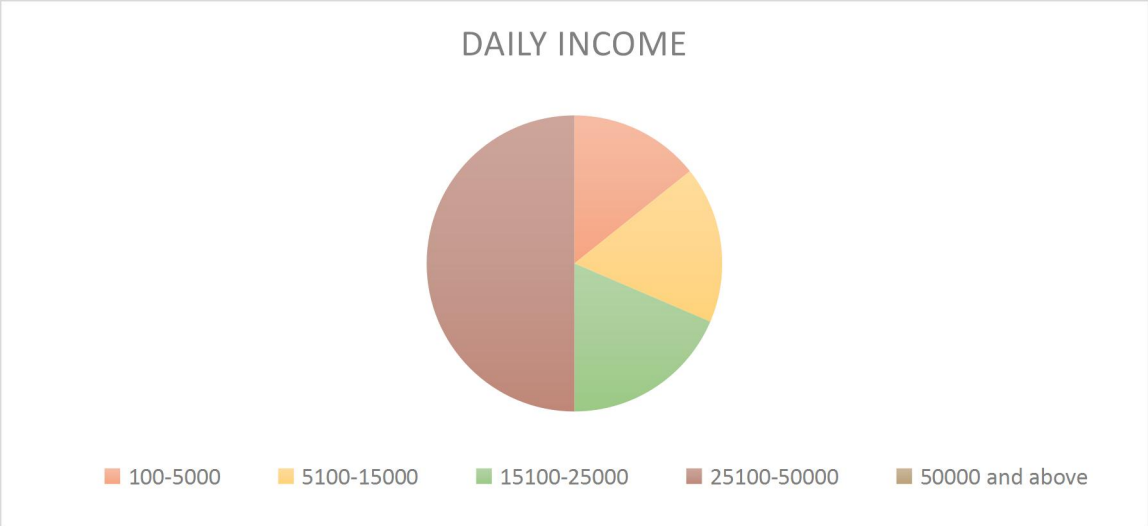

Fig. 9. Distribution of Respondents Based on the Average Daily Income of Fishers in Ajoki Creek, Nigeria.

DISCUSSION

The predominant occupation of the people in the Ajoki community is fishing with 40% of the natives actively involved followed by farming (30%) while the remaining 30% were involved in other occupations (transportation, wood logging, trading, hunting and small scale aquaculture). Mmom, and Mbee (2014), had reported contrarily that, the predominant occupation of the people of Ajoki, was Wood logging recorded at 58.3% involvement, whereas fishing was one of the minor economic activities recorded at 5.5% involvement. However, this situation where fishing is the primary economic activity (as recorded in this study), is commonly seen in many riverine communities world-wide. Ahmad *et al.* (2018), reported fishing as a means of livelihood to most persons in areas where

water bodies are found, especially in rural areas.

Also, the type of fishing recorded, revealed that, some of the fishers fished on part time basis while others fished full time, although the ones on full time were more. This pattern is common with most fishing communities, especially in Nigeria. Arowolo and Awotunde (2004), and Gwary *et al.* (2014), in their study on the fisheries in Oyan Dam, Ogun State and Lake Alau, Maiduguri, Borno State, reported that the communities around the water bodies utilize it for fishing as an essential occupation, either on full or part time. Smith (1979) and Arowolo and Awotunde (2004), reported that when fishing activity is a part-time job, household income from other businesses is used to supplement it.

The fishing method observed for this study area was artisanal, confirmed by the use of traditional wooden dug-out canoes as the major fishing crafts (Fregene *et al*., 2003; Igwe *et al.,* 2016). A majority of these canoes were not motorized. Also a few fiberglass boats, fitted with out-board engines were also available. This finding was similar to that of Mmom, and Mbee (2014), who reported these three categories of boats owned/operated by fishermen in the Ajoki area, to be dug-out canoes of various sizes carved out of wood, the banana boats built from plank boards, and the Glass Reinforced Plastic (GRP) boats. Similarly, Igwe *et al.* (2016) working in Soku area of Rivers State, a riverine community, reported that the fishers observed were all artisanal or small scale fishers operating dug-out wooden canoes of which some were motorized and others were not. Okpanefe *et al.* (1991), reported that fishing vessels in the Benin River from which the Ajoki Creek emanated, consist of small non-motorized dug-out canoes, and in a few cases banana-boats without out-board engines. Mmom, and Mbee (2014), further stated that the out-board engine enhances the distance and time covered and therefore increases the chances of the fisher to catch more and larger fishes. Okpanefe *et al*. (1991) reported that lack of outboard engines limited the area of operation of the fishermen and consequently their catches. The fishing gears operated in Ajoki Creek varied widely (cast nets, gill nets, long lines hook and line, circling nets and seine nets; basket and non-return valve traps of different types and sizes, pole and hook traps). However, the gears used in Ajoki was dependent on the fish species being sought for, their sizes, the location of the fishes (creek or swamp), the feeding mode; affordability of gear, ease of use and age of fisher, among others. This is in agreement with the study of Okpanefe *et al*. (1991) who reported that, fishers in the Benin River area employed a wide range of gears for their fishing operations, depending on the fish to be targeted. They added that, the main gears in use include gill nets, longline, hook and line, cast nets, set nets, beach seines, encircling net for crayfish, and a variety of traps used both for fish and for crayfish. These fishing gears were made from local materials and manually operated. This is synonymous with artisanal fisheries in the Niger Delta and its flood plains (Otobo, 1995; Udolisa, 1994; Fregene *et al*., 2003). Generally, artisanal fishery is an economic activity characterized by individuals or small groups that use labour intensive gears with relatively low level of productivity (Fregene *et al*., 2003; Gwary *et al.,* 2014). According to the FAO (2008), 6.9% of the world fishers are engaged in artisanal fisheries, and it is the dominant fishing activity in Africa. Earlier, Fregene *et al*. (2003) had reported that artisanal capture fisheries characterize fishing activities in Nigeria. Okpanefe *et al.* (1991) also reported that, this fishing method is similar to fisheries in the creeks. Also, artisanal fisheries was reported to be synonymous with fishers in rural fishing communities, such as in Lagos and Rivers States (Adesehinwa and Bolorunduro (2007); Suleiman and Fregene, 2011; Igwe *et al.,* 2016). Igwe *et al.* (2016), reported artisanal fishery as the popular fishing in the riverine communities of the Niger Delta. The

reasons given for the use of traditional gears in this community according to the natives, was due to inadequate funds (*Personal communication*). However most respondents emphasized the appropriateness of the gear types used, for the fishes being caught, as also reported by Okpanefe *et al*. (1991).

Fishing in Ajoki Creek is actively done by both males and females. However, the fishing activity was dominated by the male fisher folks, revealing that they were more involved in the economic activity than the females. This is common with most communities in Nigeria. In a study of Soku community in Rivers State, Igwe *et al.* (2016) reported that, the men and the women folk are actively engaged in fishing, but with a dominance of the male fishers.

In the Ajoki fishery, the male fisher folks were observed to operate majority of the different types of gears that are more complex and thus catch larger fishes, whereas the female fishers operated mainly the light traps (basket traps and sometimes the long lines and gill nets) and fished juveniles of fishes, and shellfish (*Macrobrachium vollenhovenii* and *M. macrobrachion*) in the swamps and in the flooded grasslands. This situation is common with most fishing communities.

Wokoma (1991), Shalesha and Stanley (2000), Ibim and Francis (2014) reported that, in most fishing settlements, women are mainly involved in fishing for shellfish and processing harvested fish, while the men mainly go for bigger fish fishing.

It was reported that Shrimps, one of the leading highly priced sea foods, is harvested by female small scale fishers (SPDC EIA of Soku Gas plant- San. Bart. (2013). Also, the IUCN Niger–Delta Panel (2013) report similarly stated that, in the Soku area, as is seen in the Niger Delta Area, the male fishers fished around the open areas of the water body and nearshore areas while the women and children and men who lack boats pick/ harvest Oysters. According to Igwe *et al.* (2016), the women in Soku community were known to pick/fish seafoods. The artisanal shell fishery of the women fishers has been an age long engagement, which cannot be underestimated as an important component of fishery in the Niger Delta Area (The SPDC EIA of Soku Gas plant- San. Bart., 2013).

The age-class of fishers revealed that, the ages of female and male fishers involved in the fishery were similar, as they all commenced from young age to maturity at 50 years (females) and 60 years (males). This revealed that the respondents belonged to the active segment of the population, as they were mostly young energetic and vibrant people. This is in consonance with the work of Olowosegun *et al*. (2004) who recorded similar age-class fishing in the Kainji Lake. It was added that this age-class can have positive effect on the business aggressiveness of the fishers. Also, Suleiman and Fregene (2011) in their study reported that, the artisanal fishing industry in Kebbi State is dominated solely by small scale, full time fishers who are within the productive age bracket, with varying degrees of experience in the art of fishing, thereby sustaining the fishing in the state.

The daily catch per landing per day for most fishers in the Ajoki community showed a predominance of large sized catches, even though there were varying sizes of fishes. Okpanefe *et al*. (1991) reported that, fish from the Benin River, the main channel from which the Ajoki Creek emanates end up in distant market circuits indicating larger volumes and surpluses.

The average daily income of the Ajoki fishers revealed majority of the fishers accruing high income for their enterprise. The aim of any economic enterprise is to derive some benefit in form of economic return (Okpanefe *et al.,* 1991). According to Alam *et al*. (2012), one major factor affecting the livelihoods of fishers is bargaining power and market information at

the primary markets, meanwhile price is determined by direct bargaining between the sellers and buyers. The majority of the fishers in Ajoki fishery earned well and could take care of their households adequately. In fact, the fishers claimed that, the demand for fish in the community was higher than the supply and so they sell off their catches (*Personal communication*). Suleiman and Fregene (2011) reported that, livelihoods and food security of millions of people across the world are supported by small-scale fisheries, and this has been known to be capable of contributing tremendously to socio-economic development of fishing communities. Ahmad *et al*. (2018) thus stated that, if artisanal fisheries is managed appropriately, it can make tremendous contributions to socio-economic development of fishing communities. This is the situation in the Ajoki community.

In cases where large catches were available, the fishes were smoked and taken out to nearby cities for sale. This was in agreement with Okpanefe *et al*. (1991), who reported that when the fishermen fishing in the Creeks of the Benin river return with the fish, they sell it in most cases to their wives. Sometimes, they sell the fish directly to fish traders called fish mongers or fish mammies, and that the fish is marketed in two main forms throughout the survey area either as fresh or smoked (dried).

CONCLUSION

It can therefore be concluded that, the primary economic activity in Ajoki is fishing but it is artisanal. It is operated by an energetic population and so is prosperous. Also, livelihoods around Ajoki Creek do not seem to be potentially threatened because there is much gain accruing from it, that the fishers are not likely to abandon it for something else. However, it is recommended that the stakeholders in the area should ensure the continued growth, development, and sustainability of the Ajoki fishery by; continually monitoring of this fishery, propose and provide incentives, such as low taxes, cut in development levies, adequate fishery development loans/grants, among others to be given to the fishers, promulgate and utilize laws that protect the fishery practice, the creek environment, and the fishes. These will go a long way in enhancing sustainable growth and development of this fishery, and the socio-economic development of the community at large.

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