The Operational Perspective of Monofilament and Multifilament Gillnets in Catching *Chrysichthys Nigrodigitatus* in Cross River Estuary

Eyo Ambrose* and Isangedighi Isangedighi

Department of Fisheries and Aquatic Environmental Management, University of Uyo, PMB 1017, Uyo, Akwa Ibom State, Nigeria.
*Corresponding author E-mail address: eyoambrose@yahoo.com

Abstract: Silver catfish, *Chrysichthys nigrodigitatus* is an important and valued food fish among the dominant commercial catches exploited in the southern part of Nigeria. This study was conducted from February 2015 to January 2016 with a view to determining the operational effort of monofilament and multifilament gillnet in catching *C.nigrodigitatus* in the lower Cross River estuary. Set and drift types of gillnet are mainly used for *C. nigrodigitatus* fishery in the study area. The nets are operated either in the early hours of the day (morning) or during the night in the main river channel and sometimes in the marginal water of the river and creeks or set across or parallel to the water body. A fishing effort of 6- 8 hours and two (2) crew men per boat is employed. The efficiency of the gill nets is largely influenced by the behaviour of fish in relation to the visibility of the gear, which is related to the type of materials selected for its fabrication. The relatively cost of monofilament and multifilament nets also influences their use in Nigeria. T-test analysis showed that the weight of fish caught by monofilament and multifilament gillnets were significantly different from one another ($p < 0.05$). Multifilament gillnet caught the highest number of fish (98) while monofilament gillnet caught the least (91). But monofilament gillnet has the highest weight of fish (304.87kg) while multifilament has the least (256.58kg). Based on the study, multifilament and monofilament gillnets are the recommended gears among others for fisher folks in catching these dominant migratory species.

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Introduction

Gillnetting is used to harvest many species of fish in coastal areas throughout the world (Gray *et al.,* 2005). The catch efficiency of gillnets are very different depending on the various types of fish.

Polyamide (i.e. nylon) became the first synthetic materials to replace cotton or hemp in fishing gear construction (Hutchings *et al.,* 2002); initially as multifilament, and later as monofilament. Following the adoption of monofilament nets, thinner-filaments have been adopted over time to further improve catching efficiency (Yokota *et al.,* 2001).

However, monofilament is not always more efficient and it seems that size and shape as well as water characteristics and net colour may alter the relative catch rates of the different net types. For example, trials in a Lake Oguta in Nigeria showed that multifilament gillnet generally caught higher quality and more fish (as fish entangled more easily) (Njoku, 1991). In another study, where catch rates are very high and "soak times" (time the nets are left in the water on each fishing occasion) longer, rapid saturations of monofilament nets may reduce the relative efficiency compared to multifilament nets. A disadvantage of nylon nets is their relatively high sensitivity to ultraviolet rays (Thomas and Hridayanathan, 2006). A study also showed that net visibility differs between species due to differing light effects (Wardle *et al.,* 1991).

A tough decision for some fishermen is whether to use conventional multifilament twine netting or monofilament nylon netting. Each having some good features and each have some disadvantages. Multifilament twine is more limp and will bag a fish a little easier than monofilament. This means a wider range of fish size are caught in nets made of multifilament netting. Multifilament is harder to keep clean because sticks and debris do hang in this type of net. Monofilament is not quite as strong as twine, but in clear water, fish will hit the monofilament better because they can not see it well. Sticks and plastics will fall right out of monofilament netting just by shaking it. Since monofilament is a single strand, it is harder and more difficult to see.

The silver catfish, *Chrysichthys nigrodigitatus* (Lacepede) occurs in most of the major rivers in Africa (Ezenwa, 1981). It is a valued food-fish in the Niger-Delta, also among the dominant fishes of commercial catches. *C. nigrodigitatus* is the most commercially important single freshwater species in

the Niger Delta with all year fishery especially in the Cross River State (Ama-Abasi and Okwara, 2012). *Chrysichthys nigrodigitatus* is commonly known as silver catfish in English and also as "Inagha" by the local fisher folks. *C. nigrodigitatus* are commercially significant and have a wide range of distribution inhabiting freshwater and brackish water bodies of West Africa.

River fisheries are highly seasonal in nature and play a significant role in the economic condition of the fishing communities. The riverine fish catch in Nigeria is greatly diverse and comprises of marine intrusive elements (Essen, 1990; Moses, 1976; Udoidiong and King, 2000; Teugel *et al.,* 1992; Onuoha *et al.,* 2010). Fishery of economic importance in this river includes catfish; *Chrysichthys nigrodigitatus, Clarias gariepinus, Heterotis niloticus* (Ecomog) etc.

Estuary provides habitat for many fish species, such as salmon; *Oncorhynchus*, Catfish; *Chrysichthys, nigrodigitatus,* Mullet; *Mugil cephalus,* Ecomog; *Heterotis niloticus* and even Crustaceans (e.g. crabs, lobsters, prawns, shrimp), Molluses, etc. (Gillanders, 2003). Hence, they are regions of abundance in aquatic biodiversity. The inflows of both sea water and fresh water provide high levels of nutrients both in the water column and in sediment, making estuaries among the most productive natural habitats in the world (Mclusky and Elliot, 2004).

The assessment of fishing gear i.e. monofilament and multifilament gillnets being the most abundant gear used in the exploitation of this fish and methods of operation, provides a mitigation strategies and conservation technology framework for the sustainable utilization and development of these highly economic fishery resources in the Cross River estuary. This research was conducted to**; 1.** Ascertain the operational perspective of multifilament and monofilament gillnets used in catching *Chrysichthys nigrodigitatus*, **2**. Study their design characteristics and material specifications on how it influences their operation for future design and operational improvement and **3**. Compare catch per unit effort (CPUE) of the two gillnets and make conclusion on the most effective gillnets used in the study area.

Materials and Methods

The study site is the Obio Inwang Nkanga in the lower Cross River system of Nigeria. This area lies approximately between longitudes 7°30 and 10° E and latitude 4° and 8°N in the Southern part of Nigeria. The study area has mangrove forest vegetation (Ama-abasi *et al.,* 2004) with climate characterized by long wet season (April – October) and a dry season (November – March). Mean annual rainfall is about 2,000mm (Akpan and Offem, 1993). A short cold, dry and dusty period occurs between December and January, referred to as the harmattan season.

Study Methods

A Fisheries survey trips and field practical evaluation and verbal assessment were carried out from February 2015 to January 2016 to ascertain the monofilament and multifilament gillnet design, its mode of operation and catch efficiency for *C. nigrodigitatus* operated with either "planked – constructed" or "dug – out" canoes in the study area. Study method was based on the FAO catalogue of small scale fishing gear in Nigeria (Udolisa *et al.,* 1994). A fishery dependent survey and oral interviews (Ambrose, 2009) were also conducted with the fisher folks to ascertain their opinions on the construction of the mono- and multifilament gillnets, operational techniques, catch composition and efficiency. Fishers were also accompanied to the fishing ground to study in –situ the operation of the gear. During the sampling periods, the lengths, thickness of the gear, mesh sizes and knot distances were measured using measuring tape and ruler. Comparative study of catch per unit effort (CPUE) as an index of efficiency was carried out.

Identification of fishing gear and study method

Fishing gear and methods employed in the study area were identified and classified according to the methods of classification and description of various fishing gear by FAO, (2015) for monofilament and multifilament gillnets precisely. The monofilament and multifilament gillnets were studied as outlined in FAO catalogue of small scale fishing gear of Nigeria (Udolisa *et al.,* 1994). Drawings were made not to scale instead essential dimensions in millimeters were given. Materials were indicated by international symbol, such as; polyamide (PA), polyethylene (PE) and diameter (Ø).

Monofilament and multifilament gillnets

The lengths of both nets were drawn according to the length of the float line. The nets have no side panels, hence their depth were drawn according to the fully stretched netting. The methods of FAO (2015); Udolisa and Solarin (1989), were used.

Construction of monofilament and multifilament gillnets

Upon procurement of the net webbing of monofilament/multifilament and hanging rope from the market, the nets were mounted on the supporting stand of wood or rod in order to have the desired rectangular shape. The method described by Udolisa *et al.* (1994) and Ambrose (2012) was employed. The ratio of length of the rope which the webbing is mounted on and stretched length of the respective netting section called hanging ratio (E) was first determined, thus:

$$E = \frac{\text{Length of stapling rope}}{\text{Stretched mesh x no. of mesh-}} \quad (1)$$

Six steps were employed in the design and construction of gillnets used in the field experiments.

Stretching of net

The meshes along the length of each of the monofilament and multifilament nettings bundles were parked in order to stretch the mesh well and allowed the" run of the knot" to lie vertically.

Calculation of meshes needed in length and depth.

The required meshes in dimension of the gear, was calculated: that is the number of meshes needed for the length and depth were worked out taking into consideration the mesh size and hanging percentage. Computation was based on the formula of Karlsen and Bjornassen (1986):

$$\text{No. of meshes in the length} = \frac{\text{Length of net}}{\text{Mesh size x horizontal}} \quad (2)$$

Coefficient of hanging (E)

$$\text{No. of meshes in the depth of net} = \frac{\text{Depth of net}}{\text{Mesh size x vertical}} \quad (3)$$

Coefficient of hanging (V)

$$\text{But } V = \sqrt{(1-E^2)} \quad (4)$$

Frame lines

The head and foot ropes, made from polyethylene fibers were soaked in water for 6 hours; they were passed through the cork hole and sinker hole and tied to hooks distant from each other.

Determination of stapling line

A yard stick or gauge was used to divide the head and foot ropes into column. The length of the yard stick was computed using the method of Karlsen and Bjornassen (1986) to bear a simple relation with the mesh size of the net as well as the number of meshes that were stapled into each column.

$$\text{No. of meshes to be stapled} = \frac{\text{yard stick measurement}}{\text{Mesh size x E}} \quad (5)$$

Net mounting

Starting on the first mark on the head rope, double – clove hitch knot was made using a mounting needle. The needle was passed through the upper meshes (the number computed from equation 5 above) two meshes were picked at a go of the cut webbing and was stapled to the next yard stick mark. This process continued until the cut webbing obtained from computation in equations (2) and (3) were mounted on both the headline and footline.

Rigging

Cork and lead pieces were inserted at the appropriate length intervals along the head rope and foot rope respectively.

Measurement of length and weight of fish

The catches from monofilament and multifilament nets from different landings by fishers were counted, weighed and length measurements were also taken and recorded.

Estimation of catch per unit effort:

This was determined as shown below**:**

$$\frac{\text{Catch in (kg)}}{\text{Fishing effort (f)}} \quad (6)$$

f = Fishing time (4hrs) × no. of fishermen(2)

Identification of fish caught

The *C.nigrodigitatus* were sorted into different length groups and identified with the aid of available literature (Tobor and Ayayi, 1979; Schneider 1990).

Data analysis

The total weight and length of the targeted species, *C.nigrodigitatus* from 20 different landings each for monofilament and multifilament gillnets were used in the analysis.

Student's t-test was used to test the hypothesis that the total weight of fish caught by monofilament and multifilament gillnets do not differ. Significance was tested at 0.05 probability level.

Results

The result showed that gill net is the dominant fishing gear employed for *C. nigrodigitatus* exploitation in the study area. They are either monofilament or multifilament gill nets, operated as set or drift gill nets. However, gill nets have three modes of operations (i.e. surface; mid.; and bottom). They are constructed into various categories depending on the mesh sizes and twine thickness such as ply 2, 3, 6, 9, 12, 15…32. The netting materials are either made of monofilament polyethylene (PE) or multifilament polyamide (PA) and a bundle is equivalent to 100 yards in length. Ebiya; a local mending tool is used in weaving and mending the nets in any occurrence of wearing and tearing**.**

Gill net fishing gear

This was found to be a webbing of netting hanging vertically in the water. It has floats attached at the head-rope and sinkers at the foot-rope. A combination of floats and sinkers keep the net vertically in water as a rigged curtain, they are vital factors used in determining the hanging ratio / co-efficient of the netting. Also, any alteration in the quantity of float and sinkers determines its design characteristics and bestows the net as either surface or bottom set gillnet.

Types of gillnet fibre and construction

Table 1: Design characteristics of monofilament gillnet

Component	Characteristics
Webbing (netting) material	Polyethylene (nylon) (PE)
Diameter	1-2mm
Colour	White (colourless)
Hanging coefficient (E) Vertical E value	0.04 – 0.06
mesh size	10 – 80mm
Frontline(head and foot rope)	145 – 150m
Stapling line distance	35.7cm
Sinkers material	Lead (Pb)
Distance bet. Sinkers along footrope	163cm
Number of sinkers	100
Number of meshes in length	2030 – 2100
Floaters materials	Plastic, slipper, rubber, cork
Numbers of meshes in depth	30-50
Number of corks	200-300 (2-3 buoys)
distance between floats	163cm (1.63m)
Type of knot	Double glove knot in frame lines
Purchase price	₦ 6,500.00

There are two kinds of gillnets fibers used for gillnet construction in the area, namely monofilament and multifilament fibers.

Monofilament gill nets

This was identified as a single filament which is strong enough to function alone as a yarn without having to undergo further twisting or braiding (Fig.1).

Design characteristics of monofilament gillnet

This is elaborated in table 1. A typical monofilament is white in colour, therefore making it invisible in water for fish to detect and escape from being caught.

Diagrammatic representation of monofilament gill net is shown in figure 1. The head rope carries floats, while the foot rope carries lead sinkers spaced 163cm apart.

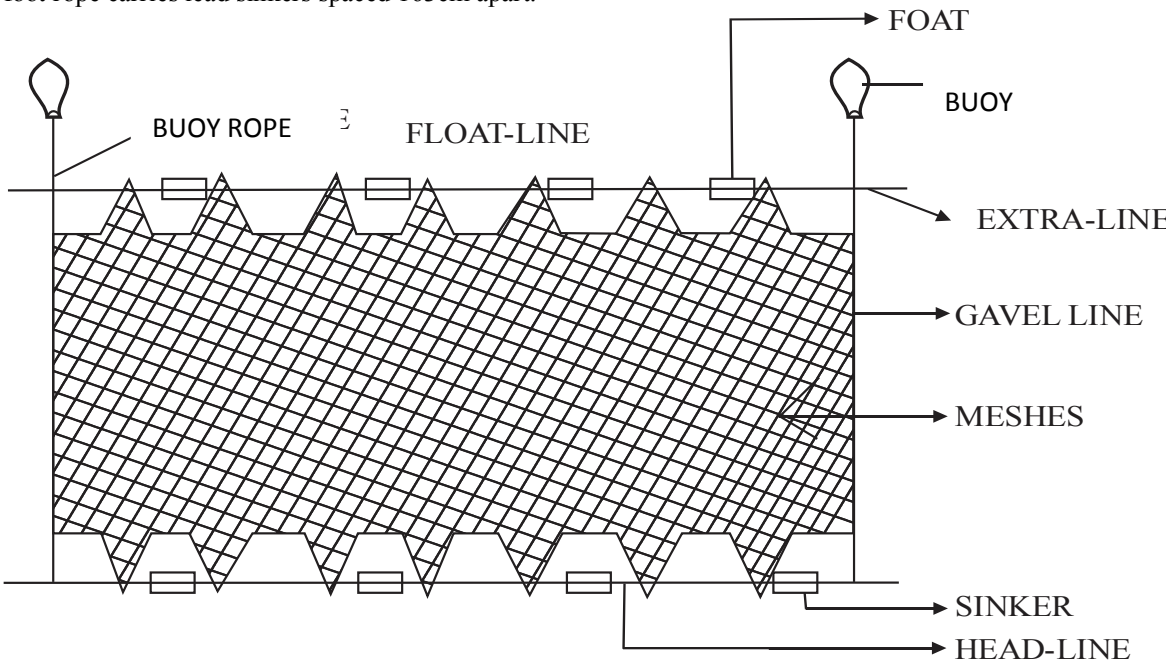

Fig. 1: Diagram of monofilament gillnet

Operation of monofilament gill nets

Monofilament gillnet is operated both as drift net and set net, the later by casting with buoy and carried by water current. It catches fish by entangling and has a large catching capacity. The net may be set across or parallel to the water current and also taking into cognizance the water tide. At the end of this operation, the anchor and buoy are dropped into water, enabling the net to hang vertically in the water like a curtain for good catching efficiency. It is usually lifted and checked at appointed intervals for catches.

Catch efficiency and CPUE of monofilament gill net

From 18 replicate landings, the net caught a total of 91 *C. nigrodigitatus* weighing 304.87 kg. The mean catch per unit effort was estimated to be 2.12kg of *C. nigrodigitatus* per man per hour. Table 2 shows the length of fish caught, which ranged from 10 – 100cm TL. However, fish with total length range of 41 – 45cm were mostly caught, while fish with length range between 71.5– 75.5cm were more in weight. Fig.2 shows that fish with length class 41.5-45.5 were mostly caught, while fish with length range of 56.5-60.5 were not caught. Fig.3 shows that fish with weight range of 71.5-75.5 were caught in greater abundant, while fishes weighing between 56.5-60.5cm were not caught by monofilament gill net in the study area.

Area of operation/seasonality of monofilament gill net

Monofilament gillnets are operated at the marginal and middle of the water. Its operational period runs all year round, used effectively between February and July due to its invisible nature in clear waters.

Multifilament gill nets

This was found to be twisted with several single yarns and have good knot stability (Fig 4).

Design characteristics of multifilament gill net

This is elaborated in table 3. It has a mesh size ranging between 10 – 80 mm stretched. The webbing material is polyamide with diameter of 2-3mm and stapling line distance of 3.5-5cm. Distance between sinkers along the footrope is 163cm and the hanging coefficient is 0.75.

Diagrammatic representation of multifilament gill net is shown in figure 4. The head rope carries floats, while the foot rope carries lead sinkers spaced 163cm apart and Anchor.

Table 2: Total length range, number of fish, weight, fishing effort and CPUE of *C. nigrodigitatus* caught by monofilament Gill Net from 20 landings

No. of landing	Total length range (cm)	No. of fish (frequency)	Weight (kg)	Fishing effort (man/hour)	CPUE (kg/man/hour)
1	10.5-11.5	1	2	8	0.25
2	16.5-20.5	2	3.2	8	0.4
3	21.5-25.5	7	11.08	8	1.39
4	26.5-30.5	4	8.1	8	1.01
5	31.5-35.5	3	7.67	8	0.96
6	36.5-40.5	8	12.42	8	1.55
7	41.5-45.5	12	20.5	8	2.56
8	46.5-50.5	11	23.4	8	2.93
9	51.5-55.5	6	18.6	8	2.33
10	56.5-60.5	0	0	8	0
11	61.5-65.5	4	14.2	8	1.78
12	66.5-70.5	3	18	8	2.25
13	71.5-75.5	10	52	8	6.5
14	76.5-80.5	4	18.2	8	2.28
15	81.5-85.5	3	15	8	1.88
16	86.5-90.5	6	32.1	8	4.01
17	91.5-95.5	5	28.60	8	3.56
18	96.5-100.5	2	19.8	8	2.48
Total		**91**	**304.87**		**38.12**
Mean		**5.06**	**16.94**		**2.12**

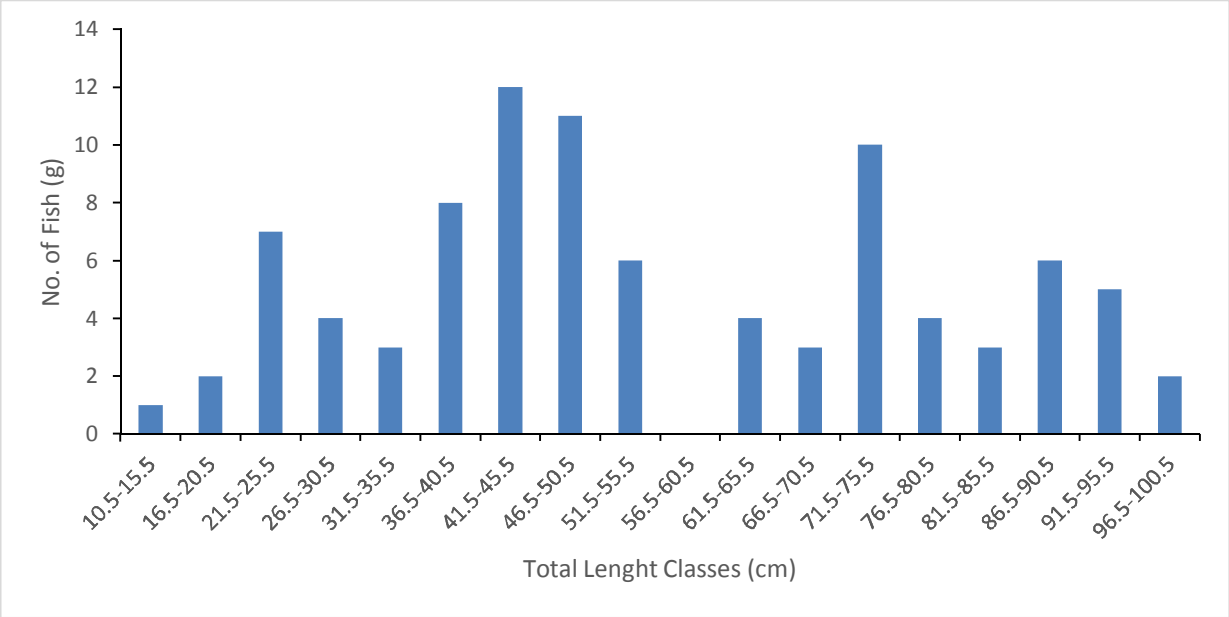

Figure 2: Number of fish caught by monofilament gillnet in the different size classes

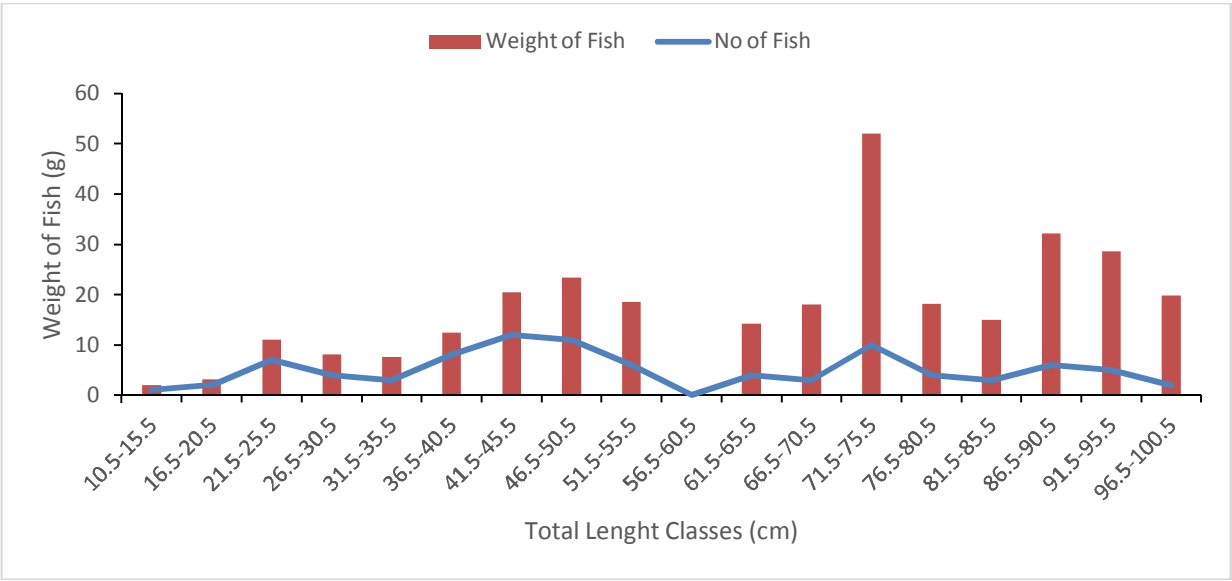

Figure 3: Weight of fish caught in the different length classes of monofilament gillnet

Table 3: Design characteristics of Multifilament gillnet

Component	**Characteristics**
Webbing (netting) material	Polyamide(PA) rope
Diameter	2-3mm
Colour	White
Hanging coefficient (E) Vertical E value	0.75
mesh size	10 – 80mm
Frame lines(head and foot rope)	100 – 150m
Stapling line distance	3.5-5cm
Sinkers material	Lead (Pb)

Distance bet. Sinkers along footrope	163cm
Number of sinkers	100 – 120
Number of meshes in length	2100 – 2200
Floaters materials	Plastic, slipper, rubber, cork
Numbers of meshes in depth	35-60
Number of corks	200-300 (2-3 buoys)
distance between floats	1.63m
Type of knot	Double glove knot in frame lines
Purchase price	₦26, 000.00

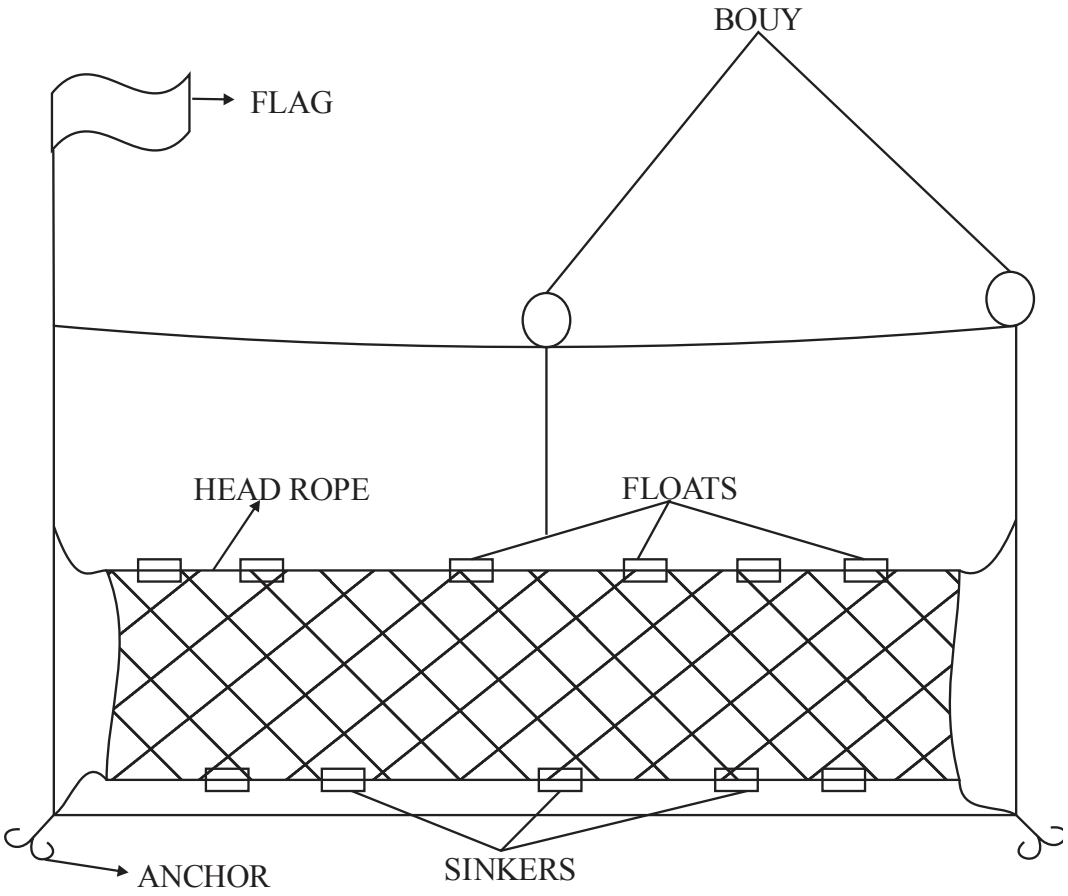

Fig.6: Diagram of multifilament gillnet

Method of operation of multifilament gill net

It is operated as set gill net with buoys and sinkers attached to it. It is stationary in water and catch fish by gilling. The set-type of gillnet is mainly used for *C. nigrodigitatus* fishery in the study area. It is operated either in the early hours of the day (morning) or during the night. A fishing effort of 4- 6 hours and two (2) crew men per boat is employed; one paddles and maneuvers the canoe while another sets the net into the water. Firstly, the anchor is put into the water, followed by the indicator buoy and lastly the whole length of the gear.

Catch efficiency and CPUE of multifilament gill net

From 18 replicate landings, the net caught a total of 98 numbers of *C.nigrodigitatus* weighing256.58kg. The mean catch per unit effort was estimated to be 1.782kg of *C. nigrodigitatus* per man per hour. Table 4 shows the

length of fish caught range from 5 – 95cm TL. However, fish with total length range of 41.5 – 45.5 were mostly caught, while fished with length range between 91.5– 95.5 cm were more in weight. Figure 5 shows the number of fishes caught while Figure 6 shows the weight variation of fishes caught by multifilament gill net.

Table 4: Total length range, number of fish, weight, fishing effort and CPUE of *C. nigrodigitatus*caught by Multifilament Gill Net from 20 landings

No. of landing	Total length range (cm)	No. of fish (frequency)	Weight (kg)	Fishing effort	CPUE (kg/man/hour)
1	5.5-10.5	1	0.5	8	0.06
2	11.5-15.5	1	0.5	8	0.06
3	16.5-20.5	3	3.37	8	0.42
4	21.5-25.5	4	7.1	8	0.89
5	26.5-30.5	5	9	8	1.13
6	31.5-35.5	7	9.47	8	1.18
7	36.5-40.5	9	14	8	1.75
8	41.5-45.5	15	27.5	8	3.44
9	46.5-50.5	8	18	8	2.25
10	51.5-55.5	6	6.5	8	0.81
11	56.5-60.5	3	4.96	8	0.62
12	61.5-65.5	5	7.2	8	0.9
13	66.5-70.5	2	13	8	1.63
14	71.5-75.5	7	22.64	8	2.83
15	76.5-80.5	3	16.2	8	2.03
16	81.5-85.5	9	30.34	8	3.79
17	86.5-90.5	4	26.3	8	3.29
18	91.5-95.5	6	40	8	5
Total		**98**	**256.58**		**32.08**
Total mean		**5.44**	**14.25**		**1.782**

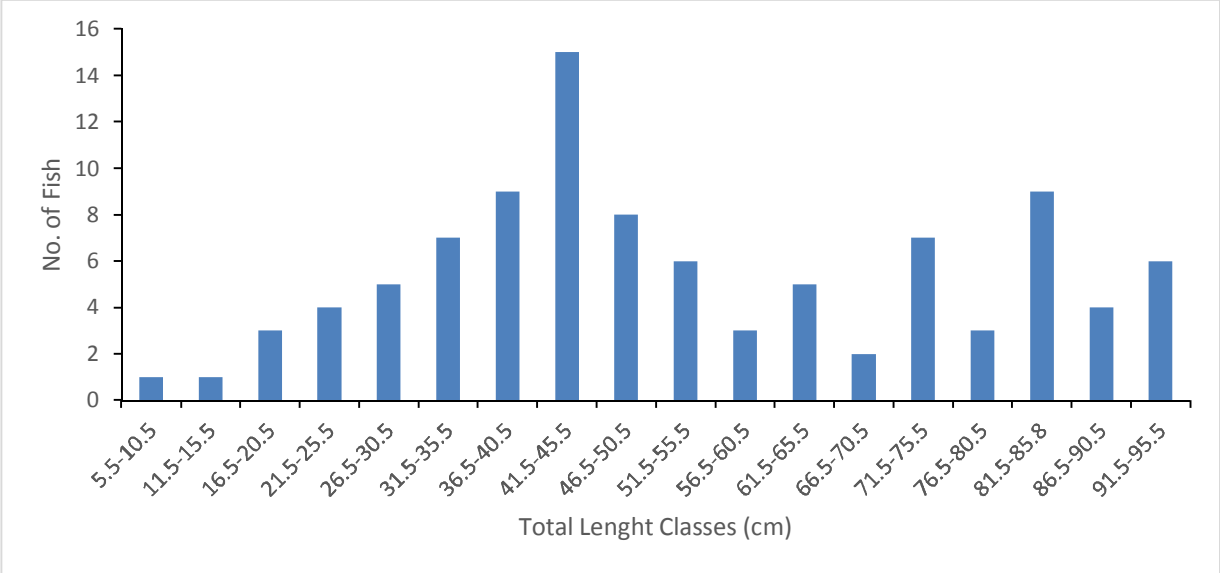

Figure 5: Number of fish caught by multifilament gillnet in the different size classes

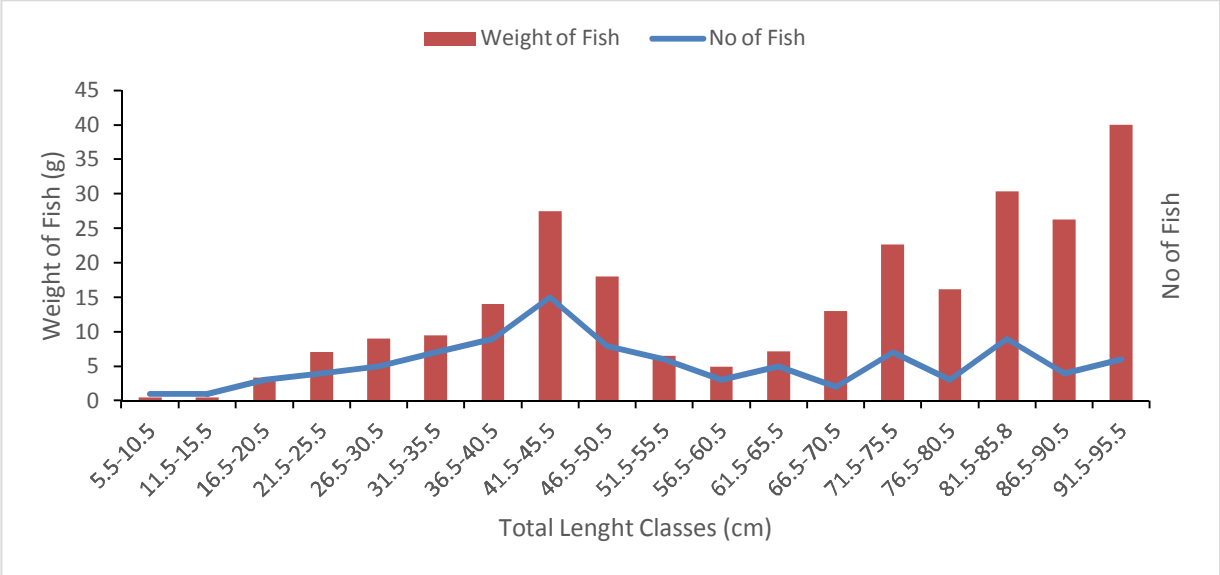

Figure 6: Weight of fish caught by multifilament gillnet in the different size classes.

Area of operation/seasonality of multifilament gill net

It is set in the main river channel and sometimes in the margins of the river and creeks. Multifilament gillnets are mostly used effectively between May and September when water is full and turbid.

Comparative performance

Monofilament gill net caught a total of 91 fishes weighing 304.87kg (Table 5) while multifilament gill net caught a total of 98 fishes weighing 256.58kg (Table 6). There was no significant difference between the total number of fish caught by monofilament and multifilament (t- test, $P<0.05$). Total weight of fish caught by monofilament and multifilament gill net do not differ. Table 7 shows the mean variation of fish number and Table 8 shows the mean variation of fish weight.

Table 5: Total number of fish caught by the monofilament and multifilament gillnet that was used for T-test analysis, N=20

S/N	Monofilament	Multifilament
1	1	1
2	2	1
3	7	3
4	4	4
5	3	5
6	8	7
7	12	9
8	11	15
9	6	8
10	0	6
11	4	3
12	3	5
13	10	2
14	4	7
15	3	3
16	6	9
17	5	4
18	2	6
Total	**91**	**98**

Table 6: Total weight of fish caught by the monofilament and multifilament gillnet that was used for T-test analysis, N=20

S/N	Monofilament	Multifilament
1	2	0.5
2	3.2	0.5
3	11.08	3.37
4	8.1	7.1
5	7.67	9
6	12.42	9.47
7	20.5	14
8	23.4	27.5
9	18.6	18
10	0	6.5
11	14.2	4.96
12	18	7.2
13	52	13
14	18.2	22.64
15	15	16.2
16	32.1	30.34
17	28.60	26.3
18	19.8	40
Total	**304.87**	**256.58**

Table 7: Mean variation of number of *Chrysichthys nigrodigitatus* caught by using monofilament and multifilament gillnet in Cross River System.

No of fish	N	Minimum	Maximum	Mean	Std. deviation
Monofilament	18	0.00	12.00	5.06	3.42
Multifilament	18	1.00	15.00	5.44	3.45

Table 8: Mean variation of weight of *Chrysichthys nigrodigitatus* caught by using monofilament and multifilament gillnet in Cross River System.

Total Weight	N	Minimum	Maximum	Mean	Std. deviation
Monofilament	18	0.00	52.00	16.94	12.35
Multifilament	18	0.50	40.00	14.25	11.18

Discussion

Fishing by gill nets is a widely acknowledged type of catching method throughout the world. Monofilament gillnets possess the advantage of both having low costs and providing higher catch rates (Marki *et al.,* 2006). Based on the study, gillnet structure, material, mesh size, netting twine thickness, netting twine color and the hanging ratio are influential on the catch efficiency. The results indicate that dugout canoes, planked constructed canoes and fiber-glass boats were widely used in the area. The artisanal fishermen mostly used the planked constructed canoes with 2 crew men while the fisher – mongers (fish marketers) used the fiber-glass boats due to its high cost. The most widely used fishing gear that is made of net webbing are the monofilament and multifilament nets which both can be joined together for effective operation in catching *C.nigrodigitatus* in the Cross River estuary. The gillnet as was observed is further classified into bottom-set multi-filament and surface- drift monofilament gillnet due to attachment of floaters and sinkers. As reported by different authors, the monofilament gillnet performed better than the multifilament gillnets in low turbid (clear water) in terms of catch per unit effort (Marki *et al*, 2006; Udolisa and Solarin, 1989).

Though the fishing power of monofilament and multifilament gill nets in turbid water is found more or less the same elsewhere (Parrish 1959), in the present experiment, the multifilament gillnets have been found more efficient in turbid water, and on an average, it was 1.78 times more efficient than the monofilament gill nets. The difference in the catch efficiency varied from multifilament gill net in clear waters, which is more efficient than multifilament gill net. Artisanal fishermen operating in the study area use gillnets having diameters of 1-2 mm for monofilament and 2-3mm for multifilament, and mesh size range from 1-32cm. The size composition of common sole catches was similar among monofilament and multifilament

possibly because the size selectivity of gillnets was primarily affected by the mesh rather than the line thickness, attributed to similar work done by Erzini (1997). In the present study, multifilament gillnets capture larger fish but few in number, while monofilaments captured the least size fish but with an increasing number. Significance variation obtained between the two nets may be due to the peculiarities of the net materials used for their fabrication. The nets were randomized during the fishing days and silver catfish data were collected to know whether it has any preference in respect of any of the two nets.

The highest catch efficiency with monofilament gill net was detected in the two months of April and May during the study period, while multifilament gillnet attained it peak during the months of July and August at the last two months. The effectiveness of the catch force (the fishing boat and the number of fishermen, the number of nets or their length) is calculated from the amount of fish caught per unit catch force. During a catch operation, non- targeted species are also caught in small quantity together with the desired species.

Efficiency of gillnets is largely influenced by the behavior of fish in relation to the visibility of the gear, which in turn is related to the type of materials selected for its fabrication (Parish, 1959). A multifilament nets is one where each 'string' or filament making up the next mesh is a thin braided or twisted twine (like very thin rope), while a monofilament net is one where the net is made of string strands of a synthetic material that looks like a stand of modern fishing line. However, where catch rates are very high or 'soak times' (time the nets are left in the water on each fishing occasion) are long, rapid saturations of monofilament nets may reduce the relative efficiency compared to multifilament. Variation in catch may also be caused by seasonal migration of this targeted species. For example, from the month of February to March, fishermen caught this fish at Itu as it migrated from the upper Cross River. At the month of May and July, it is heavily fished at Uruan. During the months of March and May, monofilament nets are mostly used due to it colouration and invisible nature in water, and catch per unit effort of the monofilament increases drastically. Between the months of May and August, multifilament gillnet are widely used due to water turbidity which make it invisible to fishes. In the month of August and September, *C.nigrodigitatus* started to migrate towards the downstream at Oron while drum gear is used to catch the fish at the study area, Uruan. From October to December the fish migrate downstream to Oron. Many fishermen used monofilament gillnets because of its reduced cost of operation and its ability to operate as both drift and set gillnet. Multifilament have a greater efficiency in terms of catch and durability, though mostly used as set gillnet during it operation. The uses of monofilament and multifilament have greatly increased in the southern parts of Nigeria, with the development of combined monofilament and multifilament gillnets of different mesh sizes in catching *C.nigrodigitatus*. Other fishing gears used in the area include hook-and-line (baited long–line, bari–bari and unbaited long-line, mari–mari) drum-net and valve trap. But gillnets are the most used fishing gear in the area. Fishing operation in the area largely depends on tidal variation with high tide being the best period to cast the net.

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