



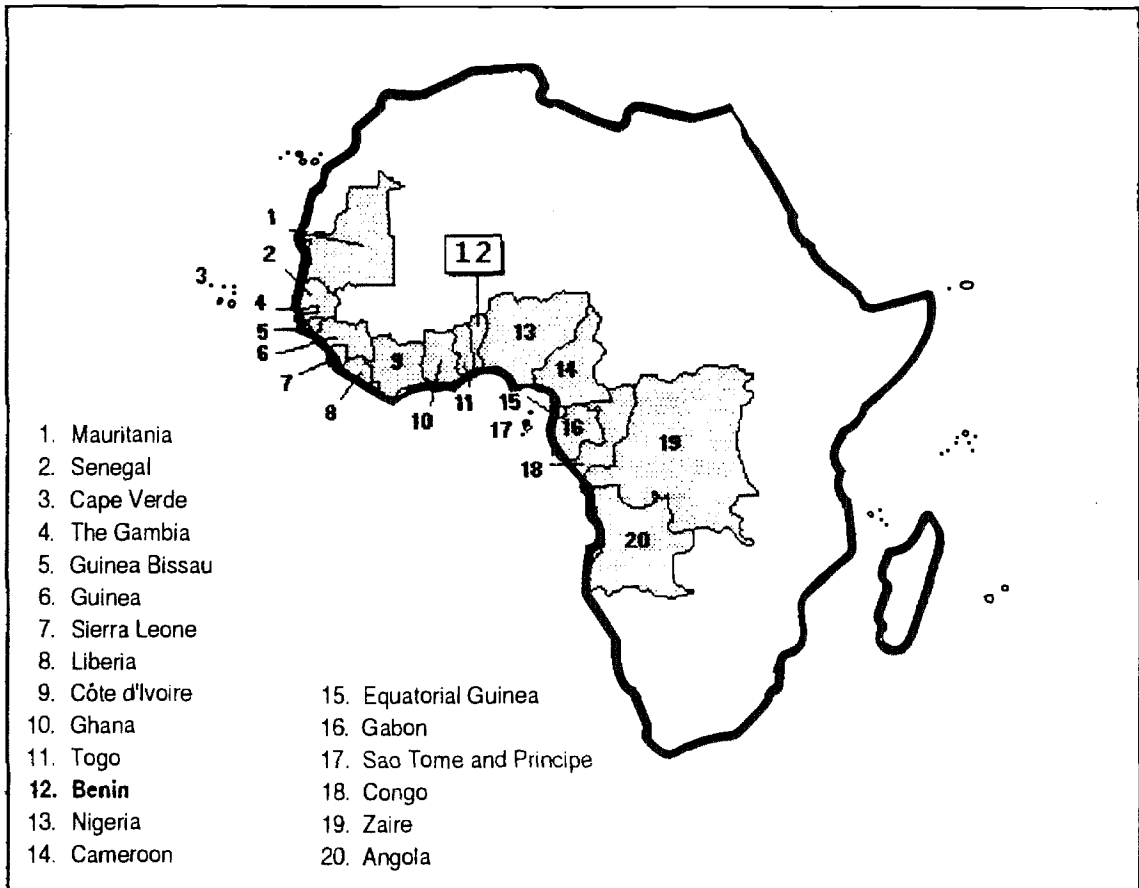
PROGRAMME FOR INTEGRATED DEVELOPMENT OF
ARTISANAL FISHERIES IN WEST AFRICA

IDAF PROGRAMME

Technical Report N°125

July 1998

**Harmful Fishing Practices in the Coastal Belt of Nigeria:
Use of Non Selective Fishing Gears**



DANIDA

DEPARTMENT OF INTERNATIONAL DEVELOPMENT COOPERATION OF DENMARK



FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

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**Harmful Fishing Practices in the Coastal Belt of Nigeria:
Use of Non Selective Fishing Gears**

by

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THE VISION FOR IDAF PHASE III

INTRODUCTION

Development strategy during the 1960 and 1970s was based on the philosophy that developing countries lacked improved technology and capital for speeding up their development. Industrialization was promoted in order to capitalize on the abundant fish resources. However, the anticipated expansion of the economy did not happen and the development approach shifted towards an integrated rural strategy where emphasis is put on the community as a whole to upgrade incomes and the quality of life through technical assistance and the active participation of fisherfolk and the community.

In this context, emphasis was initially placed on the Community Fishery Centre (CFC) concept as a means of promoting artisanal fishery development. But it became apparent that the presence of a complex of facilities and services tailored to meet local needs was no guarantee that the structures/facilities would be used or that development would occur. The active participation of fisherfolk and the mobilisation of local and community resources was imperative in order to assure sustainability of initiatives undertaken by development projects and/or the community.

So far and in general terms, the IDAF Programme has worked under the context of abundant or seemingly adequate fishery resources with moderate population pressure. The scenario is however changing (and very fast for that matter) and we would soon face the triple constraints of reduced or depleting fish stocks, degrading environment and increasing population pressure. Like in other sectors, it must be anticipated that just to survive, parts of the population surplus in the fishing communities will enter the artisanal fisheries, which will increase the competition for the resources among the small scale fisherfolk in addition to the prevailing competition between the artisanal and industrial fisheries, with their attendant effect on the environment.

This scenario calls for a continuation of the integrated participatory strategy which remains relevant to the development of artisanal fisheries in West Africa. However, the emphasis needs to be placed on the elements and mechanisms that favour the sustainability of initiatives: responsible fishing, the empowerment processes that ensure the devolution of major resource management and development decisions to the local community, the strengthening of national human and institutional capacities at all levels for a sustainable and equitable fisheries resources management and development, as well as in the follow-up and consolidation of past achievements.

DEVELOPMENT OBJECTIVE

Thus the development objective of the Programme in the present phase III which started on 1 July 1994 is to ensure twenty coastal West African countries a sustainable development and management of their artisanal fisheries for maximum social and economic benefit of their fishing communities in terms of employment, proteins and earnings. This will be done through an integrated and participatory approach in which emphasis will be laid on equity, gender issues, the transfer of technology for development, environment protection, as well as the strengthening of human and institutional capacities.

The immediate objectives are:

1. To identify, assess and disseminate strategies and mechanisms for sustainable management and development of the artisanal fisheries in fishing communities;
2. To improve the competence of national Fisheries Departments staff in development and management planning of artisanal fisheries,
3. To enhance regional technical competence in the fisheries disciplines, particularly in fishing and fish technology;
4. To improve information and experience exchange related to artisanal fisheries within the region;
5. To promote regional and sub-regional collaboration for the development and management of artisanal fisheries

In this context, IDAF will among other things tackle the following major aspects in its work :

- assisting in the elaboration and implementation of a clear and coherent national development policy for the artisanal fishery sector;
- providing advice on management and allocation of resources between artisanal and industrial fishing fleets, both national and foreign;
- involving users in the design and management of on shore infrastructures;
- monitoring the sector's evolution by the setting up of an economic indicator system for the sector adapted to the financial and human availabilities;
- improving fishing technologies in accordance with the available resources;
- increasing the final product's value by improvement in processing and marketing;
- promoting community development in accordance with the lessons learned from Phase I and II and oriented towards the sustainability of actions undertaken;
- reinforce the Programme's information/communication system

It is anticipated that by the end of the third phase of the Project, the region will have a nucleus of field oriented experts capable to respond to the challenges of the artisanal fisheries sector and to spur development in their individual countries in keeping with the aspirations and needs of fisherfolk.

EXECUTIVE SUMMARY

With respect to the Code of Conduct, it is important to study the magnitude and impact of harmful fishing gears along the West African coast. To provide a record of the harmful gears in Nigeria, the Programme for Integrated Development of Artisanal Fisheries in West Africa (IDAF), proposed a study on harmful fishing techniques.

The study was conducted in April/May 1998 in the brackish and marine fisheries, lagoons, and creeks of southern Nigeria. Six of the seven coastal States (Lagos, Ondo, Delta, Bayelsa, Rivers, and Akwa Ibom) were covered by the study.

The objective of the study was to document the use of non-selective fishing gears with excessively small mesh sizes leading to significant quantity of immature fish being landed and marketed. It was observed that harmful fishing practices are used for more than twenty years in some areas. Other issues related to this phenomenon were also considered such as the impact of these harmful fishing practices on the resource as a whole.

The reasons for engaging in these activities were identified during interviews with the economic operators on various aspects such as the pressure of the consumers on trade in immature fish (taste, prices) and the lack of awareness of the fishermen, fishmongers and consumers of the danger of catching immature fish on the sustainable use of the resources.

The study revealed details of the fishing gears in use. The historical trends in the use of these harmful fishing practices were acquired. The economics of these activities were assessed, especially investment costs, catches, fish prices, profitability, etc.

It has been established in the historical trend that the use of these peculiar fishing practices began after the end of the second and third National Development Plans (NDP) 1970 - 1985, which set out an ambitious fish production target of 1.2 million metric tons. Development projects were implemented nationwide, such as the National Accelerated Fish Production Project (NAFPP). Other projects complemented this programme such as the Operation Feed the Nation (OFN) and the FAO/UNDP assisted Artisanal and Inshore Fisheries Development Project (AIFDP).

During the implementation of these motorization and mechanization projects, fishing operations and practices were respectful of the environment. The pressure on immature fish was not pronounced.

With the down turns of the economy and the advent of the Structural Adjustment Programme (SAP), subsidies and supplies of inputs progressively vanished. As a result, to continue to fish, the fishermen, with no saving culture and no banking facilities at fishing village level, bought nets they can afford, evidently undersized. Importers started to bring into the country cheap and undersized netting. Eventually fishermen with no other alternative started to buy and use it.

Harmful fishing gears in use are often made of thin polyamide monofilament and multifilament netting. Although their durability is short, about 3 to 12 months, fishermen prefer to use them to catch juveniles because of their effectiveness.

Activities are engaged usually by men, but it is not uncommon to also see women and children carrying out fishing operations close to shore, in creeks and back waters.

It was observed fishing materials are cheapest in Lagos and prices increase with distance. As a result, fishermen improvise a lot due to financial constraints tending towards very fine netting material to maximize the catch.

Marketing of fish product in Nigeria is done in two main forms either fresh or smoked dried. Generally, marketing is carried out by women, especially in fish and shellfish, both whole sale and retail.

The taste of undersized fish (fry of sardinella, carangids shrimps) is much appreciated as protein in the diet. To make the product tasty, women generally put them in vegetable oil,). The immature Bonga "kotomama" is the favourite of fishermen and other coastal operators who prepare it in soup or roasted. The juvenile pink shrimps (*P. notialis*) is dried and ground for soup.

Regarding the pressure of consumers on the trade in immature fish, as in several countries, fish production has been decreasing steadily in the last ten years in Nigeria, while the demand for fishery products increased tremendously. Hence, the ready availability of consumers.

Several factors influenced this phenomena; the sahelian drought affecting livestock production, the lack of jobs in the inlands pushing population to coastal areas, etc. In areas like Delta State which is a major oil producing State, fish sellers enjoy the demand and patronage of highly paid oil company workers.

Women fish mongers generally believe that it is more profitable to deal in small sized fish, which requires small capital, has a high demand and assures regular income. These factors make returns higher. In addition, even spoiled immature fish do not affect the sales.

As regards awareness of fishing operators and fish sellers, the Federal State and local government are mindful of the need for sustainable use of the fisheries resources in Nigeria. Several existing Decrees are not yet enforced. However, the Fisheries Monitoring Control and Surveillance Unit (MCSU) has been set up to enforce the decrees with the support of the Nigerian Navy for a rational exploitation of resources even though there is no legislation on the activities of the artisanal fishermen.

TABLE OF CONTENTS

1.	INTRODUCTION.....	1
	1.1 Background of the study.....	1
	1.2 Objectives of the study.....	1
2.	METHODOLOGY.....	1
	2.1 Study areas.....	1
	2.2 Lagos State.....	2
	2.3 Ondo State.....	2
	2.4 The Niger Delta State.....	2
	2.5 Akwa Ibom State.....	2
	2.6 Historical trends.....	3
3.	DESCRIPTION OF THE MAIN FISHING GEARS.....	3
	3.1.1 Drift net (Juvenil Bonga fish).....	3
	3.1.2 Ita gear / Oyima (Trap).....	4
	3.1.3 Crayfish (Stow net).....	4
	3.1.4 Beach seine.....	5
	3.1.5 Mosquito net.....	5
	3.1.6 Bottom set gillnet (Net pickall).....	5
	3.1.7 Purse seine net (Watsa).....	5
	3.2 Life expectancy of harmful fishing gears.....	5
	3.3 Fishing intensity.....	6
4.	GENERAL CONSIDERATION.....	6
	4.1 Investment cost of fishing gears.....	6
	4.2 Marketing.....	7
	4.3 Taste.....	7
	4.4 Pressure of consumers in trade of immature fish.....	8
	4.5 Awareness.....	8
	4.6 Quality of adult commercial fish landed together with immature fish.....	8
	4.7 Preservation of immature fish.....	9
5.	DISCUSSION AND CONCLUSION.....	9
	Annexe 1.....	10
	Annexe 2.....	11
	Annexe 3.....	12
	Annexe 4.....	13
	Annexe 5.....	14
	Annexe 6.....	15
	Annexe 7.....	16
	Annexe 8.....	17
	Annexe 9.....	18
	Annexe 10.....	19
	Annexe 11.....	20
	Annexe 12.....	21

1 INTRODUCTION

1.1 Background of the Study

At the eleventh Liaison Officers Meeting of the Programme for the Integrated Development of Artisanal Fisheries in West Africa (IDAF) in Douala, Cameroon, the programme proposed to finance some studies on fishing technologies known to be harmful to the environment. The study was conducted in the brackish and marine fisheries around the coastal waters, lagoons, estuaries and creeks of southern Nigeria.

1.2 Objective of the Study

The objective of the study is to document the use of non-selective fishing gears with excessively small mesh sizes leading to significant quantity of immature fish being landed and marketed. Other issues to be studied in relation to this phenomenon include:

- * impact of these practices on local marine and estuarine resources.
- * major zones or areas known to be mostly concerned with the phenomena of immature fish capture and trading
- * main fishing gears operated with abnormally small mesh size, such as beach seines, castnet, mosquito net, net pickall, among others
- * number and kind of fishing gears operated to catch immature fish in the area, seasonally or yearly with summary tables of the gears used
- * historical trends in the use of these fishing gears and the economics of these practices (investment costs, catches, fish prices, profitability etc.)
- * pressure of consumers in the trade of immature fish (taste, prices) and the awareness of fishermen, fishmongers and consumers of the danger of catching immature fish on the sustainable use of resources.

2 METHODOLOGY

2.1 Study Areas

This study was conducted in six out of the seven coastal states of Nigeria. They are within the rain forest belt of Nigeria that experiences a well-marked alternation of wet (May - October) and dry seasons (November-April). Two peaks of rainfall linked with excessive floods are generally associated with all these areas, a major peak in June and lesser peaks in September. In Lagos State, the selected villages are located within the Lagos lagoon and along the coast, while in Ondo, the village is situated on the mud coast. The Niger delta lies between Benin river in the west and Imo river in the east. Three states Delta, Bayelsa and Rivers make up the Niger delta. Akwa Ibom State coastline lies after the Niger delta on what is known as the Strand coastline, lying between Imo river and the Nigerian/Cameroon border in the east including the Cross River as shown in annexes 1-11.

2.2 Lagos State

The Lagos lagoon is part of a series of coastal lagoons found along the West African coast. It is linked to the Lekki lagoon to the east and empties into the sea to the west through the Lagos harbour providing access to the lagoon throughout the year.

Tidal influences during the wet season are minimal and freshwater biota are common at this time. In the dry season tidal influences are experienced inland. The brackish environment is therefore a consequence of the influence of tidal sea water incursion and freshwater discharge from adjoining creeks and rivers, making the hydrology and salinity (between 0 and 28‰) of the lagoon of considerable ecological significance. Fishing villages in the Lagos State are Tarkwa Bay at the Harbour entrance, while Orimedu and Magbon Segun are located on the Lagos coast.

2.3 Ondo State

The Ondo coast is a flat and low lying coast with a width of 1 to 2 km of very fine sediment on the surf zone. Further eastwards is the Mahin lagoon which is brackish to fresh depending on the season. Most of the villages are located along the coast. Two villages were visited. One of them, Ayietoro, is a typical fishing village with all the fishermen well equipped with gear combination for different fishing seasons. They also culture marine species *Tarpon atlantica* during the period when the eggs are available.

2.4 The Niger Delta States

The Niger delta covers a total area of 75,000km² which is arcuate in shape and rimmed by a chain of approximately twenty sandy barrier islands. Each barrier island is comprised of coarse to fine sand with alternating low lying sand ridges reaching 3m above sea level. It contains about 19 rivers with estuaries flowing into the Atlantic Ocean. These are the most important areas for breeding nursery for most marine and estuarine, even fresh water species. The study was conducted in three river systems within the Niger delta. Ugoegin in Delta state is situated along the right bank of Benin river from the trading port of Koko. Agge on River Ramos, Ekenie on River Pennington and Sengana on River Sengana are all in Bayelsa State, while Elem Ifoko on New Calabar River is in Rivers State.

2.5 Akwa Ibom State

Akwa Ibom state is one of the seven coastal states and its ranked third highest in coastal domestic fish production. The water resources are both estuarine and marine. Rivers Imo and Cross River form the boundary with Cross River State. This study was conducted in two settlements; Obianga (Lagos) on Imo River estuary, were mainly crayfish (estuarine prawn) is targeted with passive stow nets. Clupeids are caught during the dry season. Inua Abasi situated both on the estuary and the coastline lands crayfish and clupeids also. At Ikon Eto further inland on the Cross River, advantage is taken of the breeding habits of the fish species which make them highly vulnerable. These species are *Chrysichthys nigrodigitatus*, *C. auratus*, *Synodontis sp.* and *Clarias sp.*

2.6 Historical Trend

Objectives of the fisheries component in the second and third National Development Plans (NDP) 1970-1985 in Nigeria set an ambitious production target of 1.2 million metric tons. To realise the set objectives, development projects such as the National Accelerated Fish Production Project (NAFPP) were initiated.

NAFPP was implemented nationwide. Essential fish production inputs; outboard engines with spare parts, bundles of fishing nets, accessories, and with improved fishing boats were distributed to registered fishermen cooperative societies at 50% subsidised costs.

Other projects which complemented the NAFPP to ensure adequate supply of fishing nets included Operation Feed the Nation (OFN) and the FAO/UNDP assisted Artisanal and Inshore Fisheries Development Project (AIFDP). During these laudable projects for motorization and mechanization, prices of fishing nets (cotton multifilament and monofilament) were affordable and fishermen engaged actively in correct fishing operations as well as fishing beyond the creeks and estuaries.

The pressure on immature fish was not pronounced even with the non - restriction on importation of fishing nets of all types. There were general increases in quality (size) and quantity of fish production and both fish mongers and consumers were notably satisfied.

With the down turns in the economy and the advent of the Structural Adjustment Programme (SAP), subsidies and supplies of inputs were progressively reduced and finally stopped. Input broke down and was maintained and improvised and finally discarded. Fishermen had to buy the inputs with subsidies or loan issued among themselves because there are no banking facilities in fishing villages/settlement and fishermen have no saving culture. They bought cheap nets which were obviously undersized. The situation was compounded by importers bringing into the country cheap nets with undesirable mesh sizes which they were convinced the fishermen would buy because of the harsh economic situation.

Presently, small scale marine and estuarine fishermen engage in exploiting the resources by catching juvenile and immature fish in the creeks, estuaries and near shore for consumption and for sale to meet pressing domestic obligations such as education of children, clothing, housekeeping and ceremonies.

3. DESCRIPTION OF MAIN FISHING GEARS

3.1.1 Drift Net (Juvenile Bonga net)

An important fishing gear used by marine artisanal fishermen in most of the fishing settlement. The mesh size used varies with the size of the Bonga targeted. As the nursery grounds are within the estuary the size varies according to the size of the fish during fishing period. The nets are often operated on the surface or at a distance below the surface. The gear drifts with the current with one end tied to the canoe or free. Often the fish is sighted before the net is set to surround and entangle the approaching school of fish. The same type of net is also used to catch *Sardinella spp.* but with smaller mesh size of 6 mm and 13mm, but for Bonga the mesh sizes vary from 13 mm, 26mm, 32mm to 39mm. The various sizes of the monofilament gear are given in table 1.

Table 1: Various sizes of fish and the mesh sizes used for the fishing season

Stage	Month of occurrence	Total Length (mm)	Mesh Size (mm)	Local names
Fry/juvenile	November- May	50 - 110	6, 13 and 26	Yoyo, Omoseke, Seke, Ikerere
Immature	June-October, November-May	120 - 170	26, 32, 39 and 51	Kotomama, Sungu, Ikpende
Adult	November - May, June - October	180 >	64, 72 and 89	Agbodo, Efolo

3.1.2 Ita Gear /Oyima (Trap)

The main target is *N. hastatus* but in the dry season (November to April), juveniles of all fish species are caught. The gear is tubular in shape and made of cane with a total length of about 12 - 15 metres and of mouth opening diameter of about 1.5m. It is operated in estuaries as the change in the tide bring in more juvenile especially during the fading moon phase (a quarter). The traps are set during ebb tides with the mouth facing the river with the codend facing the sea, the trap is held down by strong stick pegs. Often the gear is composed of three part netting material and less cane. The Ita gear or Oyima is brought out of the water twice a month for cleaning, maintenance and drying that takes three days. The life span of the netting material is 3 - 4 years while the cane is 6 - 7 months and is replaced twice a year. Months of intensive operation are the months from October to May with November to December being peak of activity. The size of fish caught ranges between 3 and 5 cm.

3.1.3 Crayfish Net (Stow Net) = “Asuwe, Asu, Nkoto, Esik, Obollo”

The gear is composed of multi filament nylon nets, designed into a conical bag of different mesh sizes on different parts of the structure, as in fig 3. The net is used in the lagoons, estuaries and sea. The targeted catch is “crayfish” *Nematopaleomon hastatus*, but juveniles of other fish species are also swept into the gear. The trap has many names depending on the area; in the western part of Nigeria it is called; Asuwe (Yoruba), Nkoto or Asu in the Niger delta, Esik or Obollo in the Eastern part of Nigeria. A stow net length ranges from 7 to 30 metres, with a mouth opening of 4 to 15 metres.

Depending on the area of operation it can be a passive or an active gear. In western Nigeria and part of the Niger delta the net is towed using a 40hp outboard engine in the near shore zone while in other parts of the Niger delta and the Eastern part of Nigeria where the gear is passive (set with stakes anchors and marker buoys) an 8, 15 or 25 HP out board engines is used to transport about 9-40 gears in each canoe to the fishing ground. The paddles and polyethylene sails are used in the estuaries on the Niger delta and Eastern Nigeria. The gear usually set against the tide is inspected and removed at the turn of the tide. Stow nets are operated throughout the year, except in July to September when rough weather conditions prevail at sea and salinity in the estuary is reduced. Peak fishing seasons occur in April and May and the second peak in November and December.

3.1.4 Beach Seine

Beach seines are operated from the shores of lagoons, estuaries, or the sea. The nets are operated all the year round with peaks in October and April. The gear can be 100 to 300 metres or more in length with a depth of 5-22metres. The mesh sizes reduce towards the code end of the gear. The lead rope is left ashore while the other end is taken out in a canoe facing the current and brought back to shore. Depending on the size of the seine net, it might require about 20 or up to 100 fisherfolk and many hours to haul in the net. The net lands everything that is swept in by the groundrope mostly juveniles and immature species of commercial importance such as Sciaenidae, Carangidae, Sphyraenidae, Pomadasyidae, Clupeidae, Engraulidae and Paenidae. The observed total length of fish species swept into the code end ranged from 3 to 35 cm during the study period.

3.1.5 Mosquito Net

Mosquito nets are operated in the creeks, mud flats on rivers and lagoons. The mosquito nets are operated all year round with peaks in the dry season between October and April. The gear can be 5 to 8 metres long with a depth of 1.5 - 2.5metres.

The mesh sizes could not be ascertained. Depending on the size of the net, it can be operated by a fisher or two from a canoe or by walking on the mud flat. The fishing can also be carried out in the night because clupeids are attracted by light and they form an aggregation which eases their collection. The net catches mostly fry and fingerlings of species of commercial importance, such as *Sardinella sp*, *Ethmalosa fimbriata*, *Penollula sp*, and *Engraulidae*.

3.1.6 Bottom Set Gill Net (Net Pickall) -Abakunbo- Bring Back Something

The Net Pickall is a bottom set gill net operated at sea that catches everything. In Lagos state and other Yoruba speaking villages it is called "Abakunbo"(you must come back with something). The mesh size is 38mm with different lengths depending on the locality. In Lagos state the bundle of the monofilament is divided into 10 equal strips and joined longitudinally, giving a total length of 1000 metres and 1.5 metres depth. The Net Pickall lands juveniles and immature fish species which include *Clupeidae*, *Sciaenidae*, *Polynemidae*, *Scombridae*, *Gerridae*, *Pomadasyidae*, *Trichiuridae* and *Engraulidae*.

3.1.7 Purse Seine Net (Watsa)

The purse seine net is operated by Ghanaian migrant fishermen in Nigerian coastal waters. It is designed to use as purse at the bottom of the net to enclose fish species. Mesh size(stretched) varies from 13mm to 50mm and clupeids are mostly targeted. Total length can be 250-600 metres with a depth of 25-50 metres. It is operated at sea between the months of October to May when they are in Nigeria before going to Ghana for the clupeid season during the upwelling. The 15-metre dugout canoe is crewed by 12-18 fishermen powered by a 40 hp outboard engine.

3.2 Life Expectancy of Harmful Fishing Gears

Monofilament nets are considered very effective when in use because they are thin, but their durability is short. Fishermen engaged in catching juveniles prefer to use them. The nets often snap whenever fish is being extracted and only floats, sinkers, and the ropes are recoverable for possible recycling. They last for only 3 to 12 months depending on intensity of fishing and the fishing ground. See annexes 1 to 11.

3.3 Fishing Intensity

The fishing operation depends on whether the fishing is done in the estuary, river or sea, and the number of crew also is dependent on the system and species targeted. For small operations between 1 - 3 crew (comprising man, wife and son or man and son or two women) are involved in the marine sector the number increases to between 5 to 8 crew. In some fishing settlements the crew pool to share facilities such as boat and engine, with individual fishermen bringing in their own net. The boat owner is allowed to carry more than one net. The outboard engine owner also enjoys the same status as the boat owner.

All fishermen own a combination of gears to be able to fish all the year round and they take advantage of the proximity of the river. The fishing days vary between 5 and 7 days a week. Usually sickness is the only deterrent against going out to fish, but villagers do not fish on Sundays. During very rough weather conditions, back waters and the creeks are fished. For more details see annexes 1 to 11.

4. GENERAL CONSIDERATIONS

4.1 Investment Cost of fishing gear

Each fisherman employs two or more fishing gears depending on the season. Artisanal fishermen are experiencing serious economic constraints which have forced them back to using traditional gears. As observed, fishing gear and equipment are very expensive with the prices varying from one fishing settlement to the other, the closer the settlement to the urban centre the cheaper the price. Fishing materials are cheapest in Lagos and price increases with distance. The prices given in Table 2 below are Lagos prices that will vary greatly. Hence the fishermen improvise a lot due to financial constraints tending towards very fine netting material to maximize catch.

Table 2: Investment Cost of Fishing gears

Gear Type	Net	Floats	Lead	twine	Total (Naira)
Bonga (39mm) (Two bundles)	13,400	1,200	2,500	1,100	18,200
Sardinella (13mm)(Two bundles)	24,000	1,200	2,500	1,100	28,800
Stow Net (passive) (7m)	2100	1000	-	1,100	4,200
Stow Net (Active)	23,000	-	500	3,000	26,500
Ita/ Oyima	4,000	-	-	1,000	6,000
Bottom Set Gill Net	7,000	1,200	2,500	1,100	11,000
Cast Net	1,500	-	300	200	2,000
Beach Seine	30,000	2000	2500	2000	36,000

NOTE : May 1998, 1 US\$ = 84 Nairas

4.2 Marketing

Generally, in Nigeria, fishery products in urban centres are marketed in two main forms either fresh or smoked dried. Fishery products originating from fishing settlements are in dried form. Fish are either sold within the settlements to whole sale buyers or carried to fish markets where such markets exist. Marketing is carried out by women, especially in fish and shell fish, both whole sale and retail. Smoked products are disposed of in the following manner:

- customers arrive to collect fresh fish from fishermen (prepaid) and smoke it themselves before taking them to distant markets.
- customers arrive in the village to purchase from smokers
- fresh fish sold to other smokers within the village
- fish smokers take their products to distant markets for higher profit margins
- products sent through the boat man unaccompanied to customers outside the village.

The fry, fingerlings and immature fish are bagged in jute bags, cement bags or 50 kilogramme rice bags with each dried *Sardinella* or *Bonga* weighing between 30-40 kg. They are sold in bags, basket heaps, or measured with a plastic or enamel cup or bowl. They are so tiny that they cannot be put on racket or put on sticks as follows.

- measure for shrimps *P. notialis* 60.00 Naira (18-22mm carapace length) in small baskets with 15cm diameter, and circumference of 46 cm
- small cup measure of fry and fingerling 10-20 Naira
- Juveniles of 8-10cm about 40 pieces are sold for 60.00 Naira.

There are fish market days in all major towns closest to fishing villages. It varies according to custom of the people, it could be every 3, 4 or 5 days before the next market day. Buyers come from very far depending on the quantities, constancy usually available for such long distance ventures.

4.3 Taste

The demand for the undersized fish could have been due to the taste of the fish, the economic circumstance or the need to provide some proteins in the diet no matter the size. In Lagos the fry of *Bonga*, *Sardinella*, carangids, shrimps are fried in vegetable oil and consumed as snacks, between meals and as a condiment for soups or porridge.

The immature *Bonga* "Kotomama" is the favourite of fishermen and other local coastal dwellers. The *Bonga* at its first stage of maturity is very oily and tasty. It is preferred by the family for cooking soups or for roasting.

The juveniles of Pink shrimps (*P. notialis*) are dried and ground for or put whole in soups.

4.4 Pressure of consumers in the trade in immature fish

Fish production has been decreasing steadily in the last 10 years in Nigeria. Demand for fish and fishery products by the populace has also increased tremendously. The lingering effect of the Sahelian drought which has affected livestock production appears to have worsened the availability of protein supply. In ameliorating the situation, the coastal marine, estuarine and riverine areas of the south are constrained to play the natural role of providing the necessary protein. Nevertheless, because of high cost of input (net) and the dearth of credit facilities, efforts by fishermen to increase fish production and improve their economic condition have now resulted in catching juveniles of pelagic fishes through harmful fishing practices. Proximity to the nursery grounds for both marine and estuarine species also serves as an added advantage to catch immature fish. Most affected species like clupeids and shrimps have an obligatory estuarine phase.

Usually, large concentration of population with high earning capacity determines the consumption pattern of fish species. Large fishes such as catfishes, barracuda, red snappers are highly priced and consumed by the high income group. In Ondo State for example there are no major industries and the demand for large fish is not much and consequently such products are sent to more urbanised centres such as Lagos, Warri, Akure, Benin and Ibadan. The reverse is the case in Delta State which is a major oil producing state. The "Fish Sellers State" enjoys the demand and patronage of highly paid oil company workers.

On the whole, both sides of the populace demand for the available products in terms of big and small fish commensurably.

However, only the rich among the populace can choose from the available fisheries products. The masses who are poor consume the juveniles and immature fish being the most available, cheapest and affordable protein within their reach. Women fish mongers also believe that it is more profitable dealing in small sized fish that requires small capital, with a high demand and regular income which makes returns higher. Also the state of the product does not affect the sales, even spoiled fish of these size has its own market.

4.5 Awareness

The Federal, state and local governments (the three tiers of government) are mindful of the need for sustainable use of the fishery resources in Nigeria. Apart from the issuance of handbills and occasional Radio announcements (on harmful fishing practices) that are often prompted by notable incidents or mishaps in fishing practices, very little is being done to educate fishermen, fishmongers and consumers in this direction. Although there is an Inland Fisheries Decree No 108 of 1992, it is yet to be effective. The Federal Government targets only the industrial fishermen for whom the Sea Fisheries Decree No 71 of 1992 is effectively in place. Fisheries Monitoring Control and Surveillance Unit (MCSU) has been set up to enforce the decrees with the support of the Nigerian Navy for rational exploitation of resources, but there is no legislation on the activities of the artisanal fishermen.

4.6 Quality of adult commercial fish landed with immature fish

Immature and juvenile catches are not recorded for artisanal and industrial /commercial fishing. Records of immature fish are not included in the total annual fish statistics of Nigeria. Som

work is still going on at the Nigerian Institute for Oceanography and Marine Research, (NIOMR) Lagos to have immature fish landings quantified in the scheme of things.

4.7 Preservation of immature fish

Large percentage of the caught immature fish is smoked by fish mammals before being sent to the market. The group of fishermen in urban centres directly sell fresh clupeids to the consumers. In remote fishing villages they are smoked and well preserved.

5. DISCUSSION AND CONCLUSION

The artisanal fishermen and women who harvest fish, shrimps and molluscs in the fresh, brackish and marine waters with set nets, traps and other passive gear, use crafts ranging from paddled dugouts to motorized large Ghana-type canoes. Both the artisanal and industrial fisheries target and harvest fish and shell fish resources in units, groups or localities sufficiently discrete and distinct for their potential to be assessed independently. The Niger Delta, estuarine areas and mangroves harbour both the juveniles of the commercial pelagic and demersal fisheries in Nigeria. Bonga; *Ethmalosa fimbriata*, sardines; *Sardinella spp.* and shad *Ilisha africana* are the principal targets of the pelagic and semi pelagic component of coastal artisanal fishery. Annual Bonga catches should be more evenly distributed in time when the fishery becomes more year-round.

Catch increases that may be consequent would be large enough to support the introduction of semi-industrial purse seiner. Shell fish harvested by the artisanal include estuarine prawn *Nematopaleomon hastatus*, brackish prawn *Macrobrachium spp* and juvenile pink shrimp *Penaeus notialis*.

The marine conservation action plan for Nigeria prescribes two kinds of management policies, one with respect to conservation and the other utilization. Others include inadequacy of information, over exploitation and pollution. The situation could be remedied by more consistent monitoring of the proportion of fish harvested annually through fish stock assessments.

Nursery areas have large numbers of larvae and juveniles of fish and shell fish species. They sustain the early life stages that will later become the harvestable adult stock. As a result, to ensure that the fishery is sustainable, protection of the nursery areas in most estuarine waters is essential.

Introduction of closed areas and or closed seasons will protect the nursery areas and also protect spawning fishes when they enter or leave the ground is well known by the fishermen. For successful implementation of the sustenance and management of the resources and good fishing practice is concerned, an alternative source of income should be provided or other fisheries exploited during closed seasons.

Annex 1: Technical features of environmentally harmful fishing gears used in Nigeria

Name of the area or landing site concerned: Tarkwa Bay - Lagos West

Type of Fishing gear and local name	Beach seine (used in sea shore)	Cast net	Bottom Set gillnet "Abakunbo"	Beach seine (lagoon)
No. of gears observed on the site	11	100	52	20
Length of net "hanged" in (metres) + hanging ratio	100m E 0.50	E1.0	92m E.73	75m E0.50
Stretched depth (in metres)	5-22 m	3	1.5m	1.04m, 1.56
Mesh size (stretched meshes in mm)	22mm	12mm	37mm	13, 26mm
Netting twine size (in mm or deniers or R.tex)	R270 tex	R75tex	5mm	R270tex
Dimensions of a float (in mm)	ø 80	-	-	ø80
No of floats on a fishing gear	1534	-	300	197
Dimension (in mm) and weight (in grams) of a sinker	75gr	35gr	100gr	-
No of sinkers	1250	120	68	-
Material PA/PP/PE etc. and diameter (mm) of floatline	PE ø 18mm	-	PP/PA ø 3mm	PE ø 18mm
Material PA/PP/PE etc. and diameter (mm) of leadline	PE ø 18mm	PE ø 3mm	PA ø 3mm	PE ø 18mm
Total length (metres) or number of nets per fishing unit	80-250m (1)	5	183m (1)	30m
Gear used in surface or on the bottom	bottom	surface	bottom	bottom
Active or passive method	active	active	passive	active
This activity started in the area how many years ago	>15years	>20 year	>15years	>10years
Is the fishing gear used from shore or from canoe	shore/canoe	canoe/ mudflat	canoe	shore/canoe
Type and length of canoe	plank (12- 15m)	dug/plank	plank (5m)	plank(7m)
Mode of propulsion, paddle, sail, motor (HP)	paddle	paddle	paddle	paddle
No of crew involved	50 -100	1	2	3-5
Estimated fishing ground distance from shore	< 2 nm	1 - 5 nm	+ 1 -2nm	lagoon
No of fishing hours per day or night	3-6 hours (day)	4 - 6 hours	1 - 2.5hours	8hours
Fishing season	all year round	year round	sept - may	year round
Targeted species	all species	clupeid.	Ilisha, scaenids.	juvenile species
Cost of a new net or set of nets ready to fish	70,000 Naira	2,000 Naira	6,000 Naira	36,000
Life Expectancy of the fishing gear	3 - 5.years	1 -2years	1 - 1.5years	3-5years

Annexe 2: Name of the area or landing site concerned: Orimedu - Lagos East

Type of Fishing gear and local name	Beach seine (sea "Dogbo or Awo Fita")	Bottom set gillnet "Abakunbo"	Purse SeineNet "Watsa"	Beachseine (lagoon Awo Fita)
No. of gears observed on the site	11	52	50	20
Length of net "hanged" in (metres) + hanging ratio	100m E 0.50	92m E.73	E= 0.85	75m E .50
Stretched depth (in metres)	5-22 m	1.5m	25 m	1.04m, 1.56
Mesh size (stretched meshes in mm)	22mm	37mm	13, 18, 38mm	13, 26mm
Netting twine size (in mm or deniers or R.tex)	R270 tex	5mm	PAR1280tex, PA R230tex, PAR310tex	R270tex
Dimensions of a float (in mm)	ø 80	plastic foam	ø 70	ø80
No of floats on a fishing gear	1534	3000	2,500	197
Dimension (in mm) and weight (in grams) of a sinker	75gr	100gr	130gr	-
No of sinkers	1250	714	1,666	-
Material PA/PP/PJ etc. and diameter (mm) of floatline	PE ø 18mm	PP/PA ø 3mm	PA/PVA/PE ø 6-8mm	PE ø 18mm
Material PA/PP/PE etc. and diameter (mm) of leadline	PE ø 18mm	PA ø 3mm	PA/PVA/PE ø 6-8mm	PE ø 18mm
Total length (metres) or number of nets per fishing unit	80-250m (1)	1000m (1)	250 m	30m
Gear used in surface or on the bottom	bottom	bottom	surface	bottom
Active or passive method	active	passive	active	active
This activity started in the area how many years ago	15years	10years	10 years	>10years
Is the fishing gear used from shore or from canoe	shore canoe	canoe	canoe	shore/canoe
Type and length of canoe	plank (12-15m)	plank (5m)	Dugout (16m)	plank(7m)
Mode of propulsion. paddle. sail, motor (HP)	paddle	paddle	40 HP	paddle
No of crew involved	50 -100	2	15-18	3-5
Estimated fishing ground distance from shore	2 nm	0 -2nm	2-5 nm	lagoon
No of fishing hours per day or night	3-6 hours (day)	1 - 2.5hours	30mins-1hr	8hours
Fishing season	all year round	Sept -May	Nov - April	year round
Targeted species	all species	all species	Juvenile ofBonga/Sardinella	juvenile of all species
Cost of a new net or set of nets ready to fish	70,000 Naira	6,000 Naira	150,000-250,000	36,000
Life Expectancy of the fishing gear	3 - 5 years	1 - 1.5years	2-5years	3-5years

Annexe 5: Name of the area or landing site concerned: Ugogegin, Benin River estuary

Type of Fishing gear and local name	Ita Trap	Stow Net "Asu, Nkoto"	Bottom Set Net	Drift net "Bonga net"	Purse Seine Net "Watsa"	Drift Net "Sawa net"
No. of gears observed on the site	20	250	250	500		200
Length of net "hanged" in (metres) + hanging ratio	8-36		92	184	E= 0.85	275
Stretched depth (in metres)	-	15m	1.52 m	1.04, 1.56 m	25 m	0.52, 1.04m
Mesh size (stretched meshes in mm)	102-178	102, 70, 30, 20, 10 mm	38 mm	26, 39 mm	13, 18, 38mm	13mm, 26mm
Netting twine size (in mm or deniers or R.tex)	R1920 tex	R1060tex, R33tex	0.2 R75tex		PAR1280TEX, P A R230TEX, PAR310TEX	R75tex
Dimensions of a float (in mm)	-	-	-	ø 70	ø 70	ø 70
No of floats on a fishing gear	4	-	600	100	2,500	100
Dimension (in mm) and weight (in grams) of a sinker	-	95gr	100gr	35gr	130gr	35gr
No of sinkers	13 sticks	5	130	130	1,666	100
Material PA/PP/PE etc. and diameter (mm) of floatline	-	-	PE 5mm	PE 5 mm	PA/PVA/PE ø 6-8mm	ø E 5mm
Material PA/PP/PE etc. and diameter (mm) of leadline	-	-	PE 5mm	PE 5 mm	PA/PVA/PE ø 6-8mm	ø E 5mm
Total length (metres) or number of nets per fishing unit	12m	30 m	185 m	366 m	250 m	550 m
Gear used in surface or on the bottom	hottom	bottom	hottom	surface	surface	surface
Active or passive method	passive	active	passive	passive	active	passive
This activity started in the area how many years ago	>30 years	10 years	12 years	>25 years	10 years	>25 years
Is the fishing gear used from shore or from canoe	canoe	canoe	canoe	canoe	canoe	canoe
Type and length of canoe	Dugout-12m	plank	plank-12m	plank-12m	Dugout -16m	Plank-12 m
Mode of propulsion, paddle, sail, motor (HP)	paddle	40 HP	40 HP	40 HP	40 HP	40 HP
No of crew involved	5 - 8	2	1-2	2-3	15-18	2-3
Estimated fishing ground distance from shore	estuarine	1-5 n m	1-2 nm	1-2 nm	2-5 nm	1-2 nm
No of fishing hours per day or night	12 hours	4-6 hours	1-2 hours	30 min-2 hr	30mins-1hr	30 min - 2 hrs
Fishing season	Oct-May	Year round	Year round	March-Aug. Oct-March	Nov - April	Feb - June
Targeted species	<i>N. hastatus</i> and juveniles of fish	<i>N. hastatus</i> and juveniles fish species	Every thing , Juvenile of all fish species	fry and immature Bonga	Juvenile of Bonga and Sardinella	fingerlings of Sardinella
Cost of a new net or set of nets ready to fish	15,000Naira	26,000 Naira	13,400 Naira	26,800 Naira	150,000-250,000	72,000 Naira, 60,000 Naira
Life Expectancy of the fishing gear	3-5years	3 - 5 years	6 month - 1 yr	6-18mths	2-5years	1 - 1.5 years

Annexe : 6

Name of the area or landing site concerned: Agge

Type of Fishing gear and local name	Cast net	Stow Net "Nkoto"	Bottom Set Net	Drift Net "Sungu net"	Drift Net "Ikerere net"
No. of gears observed on the site	100	34	50	59	71
Length of net "hanged" in (metres) + hanging ratio	E 1.0	-	92	E 0.50	E 0.50
Stretched depth (in metres)	-	15m	1.52 m	1.04, 1.56 m	0.52, 1.04m
Mesh size (stretched meshes in mm)	6, 12mm	102, 70, 30, 20, 10 mm	38 mm	26, 39 mm	13mm, 26mm
Netting twine size (in mm or deniers or R.tex)	R75tex	R1060tex, R33tex	0.2	R75tex	R75tex
Dimensions of a float (in mm)	-	-	-	ø 70	ø 70
No of floats on a fishing gear	-	-	600	300	300
Dimension (in mm) and weight (in grams) of a sinker	35gr	95gr	100gr	35gr	35gr
No of sinkers	120	5	130	66	66
Material PA/PP/PE etc. and diameter (mm) of floatline	-	-	PE 5mm	PE 5 mm	ø E 5mm
Material PA/PP/PE etc. and diameter (mm) of leadline	PE ø 3mm	-	PE 5mm	PE 5 mm	ø E 5mm
Total length (metres) or number of nets per fishing unit	1	30 m	185 m	92 m	92 m
Gear used in surface or on the bottom	surface	bottom	bottom	surface	surface
Active or passive method	active	passive	passive	passive	passive
This activity started in the area how many years ago	>20 year	10 years	12 years	>10 years	>10 years
Is the fishing gear used from shore or from canoe	canoe	canoe	canoe	canoe	canoe
Type and length of canoe	dugout-7m	Dugout-12m	Dugout-12m	Dugout-7m	Dugout-7 m
Mode of propulsion, paddle, sail, motor (HP)	paddle	Paddle, 25HP	Paddle, 25 HP	Paddle	Paddle
No of crew involved	1	2	1-2	2-3	2-3
Estimated fishing ground distance from shore	Estuary	1-5 n m	<1-2 nm	estuary	estuary
No of fishing hours per day or night	4 - 6 hrs	4-6 hrs	1-2 hrs	30 min-2 hr	30 min - 2 hrs
Fishing season	Year round	Aug - Oct	Year round	April-Aug.	Oct-March
Targeted species	Sardinella and Bonga	<i>N. hastatus</i> and juveniles of fish	Everything. Juvenile of all fish species	fry and immature Bonga "Sungu"	fingerlings of Sardinella (Ikerere)
Cost of a new net or set of nets ready to fish	2,000 Naira	6,000Naira	13,400 Naira	8,000 Naira	8,000 Naira,
Life Expectancy of the fishing gear	1-2years	7-8 years	6 - 12months	6-18 months	1 - 1.5 years

Annexe : 7 Name of the area or landing site concerned: Ekenie

Type of Fishing gear and local name	Cast net	Stow Net "Nkoto"	Bottom Set Net	Drift Net "Sungu net "	Drift Net "Ikerere net"
No. of gears observed on the site	250	46	55	52	39
Length of net "hanged" in (metres) + hanging ratio	E1.0		92	E 0.50	E 0.50 . .
Stretched depth (in metres)	-	15m	1.52 m	1.04, 1.56 m	0.52, 1.04m
Mesh size (stretched meshes in mm)	6, 12mm	102, 70, 30, 20, 10 mm	38 mm	26, 39 mm	13mm, 26mm
Netting twine size (in mm or deniers or R.tex)	R75tex	R1060tex, R33tex	0.2	R75tex	R75tex
Dimensions of a float (in mm)	-	-	-	ø 70	ø 70
No of floats on a fishing gear	-	-	600	300	300
Dimension (in mm) and weight (in grams) of a sinker	35gr	95gr	100gr	35gr	35gr
No of sinkers	120	5	130	130	100
Material PA/PP/PE etc. and diameter (mm) of floatline	-	-	PE 5mm	PE 5 mm	ø E 5mm
Material PA/PP/PE etc. and diameter (mm) of leadline	PE ø 3mm		PE 5mm	PE 5 mm	ø E 5mm
Total length (metres) or number of nets per fishing unit	3	30 m	185 m	184 m	184 m
Gear used in surface or on the bottom	surface	bottom	bottom	surface on sand bars	surface on sand bars
Active or passive method	active	passive	passive	passive	passive
This activity started in the area how many years ago	>20 year	10 years	12 years	>15 years	>15 years
Is the fishing gear used from shore or from canoe	canoe	canoe	canoe	canoe	canoe
Type and length of canoe	dugout-5m	Dugout-7m	Dugout-7m	dugout-7 m	Dugout-7m
Mode of propulsion, paddle, sail, motor (HP)	paddle	25 HP	Paddle	Paddle	Paddle
No of crew involved	1	2	1-2	2-3	2-3
Estimated fishing ground distance from shore	estuary	1-5 n m	<1-2 nm	estuary	estuary
No of fishing hours per day or night	4 - 6 hrs	3 hours	1-2 hours	30 min-2 hr	0.5 - 2 hrs
Fishing season	Year round	Aug-Oct	Year round	April -Aug	Oct-March
Targeted species	Bonga and Sardinella	<i>N. hastatus</i> and juveniles of fish	Everything. Juvenile of all fish species	fry and immature Bonga "Sungu"	fingerlings of Sardinella" Ikerere"
Cost of a new net or set of nets ready to fish	2,000 Naira	5,000 Naira	13,400 Naira	20,000 Naira	24,000Naira
Life Expectancy of the fishing gear	1 -2years	3 - 5 years	6-12months	6 - 18 months	1 - 1.5 years

Annexe : 8 Name of the area or landing site concerned: Elem Ifoko

Type of Fishing gear and local name	Cast net	Stow Net "Nkoto"	Bottom Set Net	Drift Net "Sungu net =Manama "	Drift Net "Ikerere net"
No. of gears observed on the site	170	350	55	125	114
Length of net "hanged" in (metres) + hanging ratio	E1.0	-	92	184	92
Stretched depth (in metres)	3	15m	1.52 m	1.04, 1.56 m	0.52, 1.04m
Mesh size (stretched meshes in mm)	12mm	20, 15, 10 mm	38 mm	26, 39 mm	13mm, 26mm
Netting twine size (in mm or deniers or R.tex)	R75tex	210D/6, 210D/9, 210D/24	0.2	R75tex	R75tex
Dimensions of a float (in mm)	-	1	-	ø 70	ø 70
No of floats on a fishing gear	-	-	600	300	200
Dimension (in mm) and weight (in grams) of a sinker	35gr	95gr	100gr	35gr	35gr
No of sinkers	120	5	130	130	100
Material PA/PP/PE etc. and diameter (mm) of floatline	-	ø 4mm	PE 5mm	PE 5 mm	ø E 5mm
Material PA/PP/PE etc. and diameter (mm) of leadline	PE ø 3mm	ø 4mm	PE 5mm	PE 5 mm	ø E 5mm
Total length (metres) or number of nets per fishing unit	6	30 m	185 m	366 m	184
Gear used in surface or on the bottom	Surface	bottom	bottom	surface	surface
Active or passive method	active	passive	passive	passive	passive
This activity started in the area how many years ago	>20 year	10 years	12 years	15 years	14 years
Is the fishing gear used from shore or from canoe	canoe/ walking	canoe	canoe	canoe	canoe
Type and length of canoe	Dugout-5m	Dugout-7m	Dugout-12m	Dugout-7 m	Dugout-7 m
Mode of propulsion, paddle, sail, motor (HP)	paddle	Paddle, 8, 15, 25 HP	Sail, Paddle 25HP	sail, Paddle	sail, Paddle
No of crew involved	1	2	1-2	2-3	2-3
Estimated fishing ground distance from shore	estuary/ creek	estuary, 1-5n m	estuary, <1-2 nm	estuary	estuary
No of fishing hours per day or night	4 - 6 hours	2-3 hours	1-2 hours	30 min-2 hr	30 min - 2 hrs
Fishing season	Year round	Oct-June	Year round	March-Aug.	Oct-March
Targeted species	fingerlings and juvenile clupeid,	<i>N. hastatus</i> and juveniles of fish species	Everything. Juvenile of all fish species	fry and immature Bonga	fingerlings of Sardinella
Cost of a new net or set of nets ready to fish	2,000Naira	4,000 Naira	13,400 Naira	26,800 Naira	10,000 Naira, 20,000 Naira
Life Expectancy of the fishing gear	1-2years	8 years	6-12months	6-18 months	1 - 1.5 years

Annexe : 9 Name of the area or landing site concerned: Sengana

Type of Fishing gear and local name	Cast net	Stow Net "Nkoto"	Purse Seine Net "Watsa"	Bottom Set Net	Drift Net "Sungu = Ikpende"	Drift Net "Ikerere = Ikpende net"
No. of gears observed on the site	234	250	50	250	190	200
Length of net "hanged" in (metres) + hanging ratio	E1.0		E= 0.85	92	184	275
Stretched depth (in metres)	-	15m	25 m	1.52 m	1.04, 1.56 m	0.52, 1.04m
Mesh size (stretched meshes in mm)	6, 12mm	102, 70, 30, 20, 10 mm	13, 18, 38mm	38 mm	26, 39 mm	13mm, 26mm
Netting twine size (in mm or deniers or R.tex)	R75tex	R1060tex, R33tex	PARI280TEX, PA R230TEX, PAR310TEX	0.2	R75tex	R75tex
Dimensions of a float (in mm)	-	-	ø 70	-	ø 70	ø 70
No of floats on a fishing gear	-	-	2,500	600	100	100
Dimension (in mm) and weight (in grams) of a sinker	35gr	95gr	130gr	100gr	35gr	35gr
No of sinkers	120	5	1,666	130	130	100
Material PA/PP/PE etc. and diameter (mm) of floatline	-	-	PA/PVA/PE ø 6-8mm	PE 5mm	PE 5 mm	ø E 5mm
Material PA/PP/PE etc. and diameter (mm) of leadline	PE ø 3mm		PA/PVA/PE ø 6-8mm	PE 5mm	PE 5 mm	ø E 5mm
Total length (metres) or N° of nets per fishing unit	7m	30 m	250 m	185 m	366 m	550 m
Gear used in surface or on the bottom	surface	bottom	surface	bottom	surface	surface
Active or passive method	active	passive	active	passive	passive	passive
This activity started in the area how many years ago	>20 year	10 years	10 years	12 years	>15 years	>15 years
Is the fishing gear used from shore or from canoe	canoe/sandf lat	canoe	canoe	canoe	canoe	canoe
Type and length of canoe	dugout-7m	Dugout-10m	Dugout-16m	Dugout-12m	Dugout-7 m	Dugout-7m
Mode of propulsion, paddle, sail, motor HP	paddle	paddle, 25 HP	40 HP	paddle, 25 HP	Paddle	Paddle
No of crew involved	1	2	15-18	1-2	2-3	2-3
Estimated fishing ground distance from shore	1 - 5 nm	1-5 n m	2-5 n m	<1-2 nm	estuary	estuary
No of fishing hours per day or night	4 - 6 hours	2-2.5hrs	30mins-1hr	1-2 hours	30 min-2 hr	30min-2hrs
Fishing season	Year round	Sept-Oct	Nov - April	Year round	April-July,	Oct-March
Targeted species	clupeid,	<i>N. hastatus</i> and juveniles species	Juvenile of Bonga and Sardinella	Everything Juvenile species	fry and immature Bonga "Sungu"	fingerlings of Sardinella "Ikerere"
Cost of a new net or set of nets ready to fish	2,000 Naira	4,000Naira	150,000-250,000	13,400 Naira	16,000 Naira	20,000 Naira
Life Expectancy of the fishing gear	1 -2yrs	5-8yrs	2-5yrs	6-12mnths	6 - 18 mnths	1-1.5yrs

Annexe : 10 Name of the area or landing site concerned: Obianga/Lagos

Type of Fishing gear and local name	Cast net	Stow Net "Nkoto, Obollo, Esik"	Bottom Set Net	Drift Net	Drift Net
No. of gears observed on the site	113	648-1800	250	180	200
Length of net "hanged" in (metres) + hanging ratio	E1.0	-	92	184	184
Stretched depth (in metres)	3	76mm	1.52 m	1.04, 1.56 m	0.52, 1.04m
Mesh size (stretched meshes in mm)	12mm	20, 15, 10 mm	38 mm	26, 39 mm	13mm, 26mm
Netting twine size (in mm or deniers or R.tex)	R75tex	210D/6, 210D/9, 210D/24	0.2	R75tex	R75tex
Dimensions of a float (in mm)	-	-	-	ø 70	ø 70
No of floats on a fishing gear	-	-	600	100	100
Dimension (in mm) and weight (in grams) of a sinker	35gr	-	100gr	35gr	35gr
No of sinkers	120	-	130	130	100
Material PA/PP/PE etc. and diameter (mm) of floatline	-	ø 4mm	PE 5mm	PE 5 mm	ø E 5mm
Material PA/PP/PE etc. and diameter (mm) of leadline	PE ø 3mm	ø 4mm	PE 5mm	PE 5 mm	ø E 5mm
Total length (metres) or number of nets per fishing unit	5-8m	7.1m	185 m	366 m	550 m
Gear used in surface or on the bottom	Surface	bottom	bottom	surface	surface
This activity started in the area how many years ago	>20 year	18 years	12 years	>25 years	>25 years
Is the fishing gear used from shore or from canoe	canoe	canoe	canoe	canoe	canoe
Type and length of canoe	dug/plan k	Dugout	plank (12 m)	plank (10 m)	Plank (10 m)
Mode of propulsion, paddle, sail, motor (HP)	paddle	Paddle, sail, 8, 15 HP	Paddle, Sail	Sail, Paddle HP	Sail, Paddle, HP
No of crew involved	1	2-3	1-2	2-3	2-3
Estimated fishing ground distance from shore	estuary	estuary/sea 1-5 n m	<1-2 nm	1-2 nm	1-2 nm
No of fishing hours per day or night	3-4 hours	2.5 hours	1-2 hours	30 min-2 hr	30 min-2 hrs
Fishing season	all year round	June-Jan(estuary) Oct-June(sea)	All year round	March-August, October-Mach	Feb - June
Targeted species	clupeid,	<i>N. hastatus</i> and juveniles of fish	Everything	fry and immature Bonga	fingerlings of Sardinella
Cost of a new net or set of nets ready to fish	2,000 Naira	3,000 Naira	13,400 Naira	24,800 Naira	11,000Naira, 20,000 Naira
Life Expectancy of the fishing gear	1-2years	8 years	6-12months	6-18 months	1 - 1.5 years

Annexe : 11 Name of the area or landing site concerned: Inua Abasi

Type of Fishing gear and local name	Stow Net "Esik"	Purse Seine Net "Watsa"	Bottom Set Net	Drift Net "Igire Ibat"	Drift Net "Igire Ebe Ibat"
No. of gears observed on the site	388	25	250	200	130
Length of net "hanged" in (metres) + hanging ratio	-	E= 0.85	92	184	275
Stretched depth (in metres)	2.5m	25 in	1.52 m	1.04, 1.56 m	0.52, 1.04m
Mesh size (stretched meshes in mm)	28, 9 mm	13, 18, 38mm	38 mm	26, 39 mm	13mm, 26mm
Netting twine size (in mm or deniers or R.tex)	R33tex	R1280tex, R230tex, R310tex	0.2	R75tex	R75tex
Dimensions of a float (in mm)	-	ø 70	-	ø 70	ø 70
No of floats on a fishing gear	-	2,500	600	100	100
Dimension (in mm) and weight (in grams) of a sinker	-	130gr	100gr	35gr	35gr
No of sinkers	-	1,666	130	130	100
Material PA/PP/PE etc. and diameter (mm) of floatline	-	PA ø 6-8mm	PE 5mm	PE 5 mm	ø E 5mm
Material PA/PP/PE etc. and diameter (mm) of leadline	-	PA ø 6-8mm	PE 5mm	PE 5 mm	ø E 5mm
Total length (metres) or number of nets per fishing unit	7m (25-40/canoe)	250 m	185 m	366 m	550 m
Gear used in surface or on the bottom	bottom	surface	bottom	surface	surface
Active or passive method	active	active	passive	passive	passive
This activity started in the area how many years ago	20 years	10 years	12 years	>25 years	>25 years
Is the fishing gear used from shore or from canoe	canoe	canoe	canoe	canoe	canoe
Mode of propulsion, paddle, sail, motor (HP)	8m (paddle/sail).10m (8-55HP)	40 HP	paddle, sail, 8, 15, 25 HP	paddle, sail 8, 15 25 HP	paddle, sail 15, 25 HP
No of crew involved	3-6 (4)	15-18	1-2	2-3	2-3
Estimated fishing ground distance from shore	estuary/sea 1-15 n m	2-5 nm	<1-2 nm	1-2 nm	1-2 nm
No of fishing hours per day or night	2.5 hours	30mins-1hr	1-2 hours	30 min-2 hr	30 min - 2 hrs
Fishing season	Year round peaks march-June and oct/Nov	Nov - April	All year round	March-August, October-Mach	Feb - June
Targeted species	<i>N. hastatus</i> and juveniles of fish species	Juvenile of Bonga and Sardinella	Everything. Juvenile of all fish species	fry and immature Bonga	fingerlings of Sardinella
Mention cost of a new net or set of nets ready to fish	4,000Naira/g ear	150,000-250,000	13,400 Naira	26,800 Naira	72,000 Naira, 60,000 Naira
Life Expectancy of the fishing gear	5-8 years	2-5years	6-12months	6 - 18 months	1 - 1.5 years

Annexe 12 : Some Coastal States Visited to Study Harmful Fishing Practices

STATE	FISHING VILLAGE	GEAR USED	REMARKS
Lagos	a) Tarkwa Bay b) Magbon Segun c) Orimedu	a) Beach seine, trawl nets, Net pickall, cast net b) Monofilament net, cast net, stow crayfish net, Net pickall, purse seine. c) Monofilament net, cast net, Net pickall, purse seine.	Harmful " " " "
Ondo	Ayietoro	Stow crayfish net, Net pickall, Entangling drift net.	Harmful "
Delta	Ugogegin} Benin River	Ita trap, Stow crayfish net, Dragnet, Cast net, Net pickall, Drift net, Purse seine, scoop net.	Harmful
Bayelsa	a) Agge} Ramos River b) Ekenie} Pennington R. c) Sengana} Sengana River	Seine net, Dragnet, net pickall, Stow crayfish net, Entangling net, mosquito net. b) Stow crayfish net, Cast net, Net pickall, Drift net, scoop net. c) Stow crayfish net, Cast net, Net pickall, Drift net, Purse seine, scoop net.	Harmful " "
Rivers	Elem-Ifoko} New Calabar River	Fence trap, Oyima trap, mosquito net, scoop net, Entangling drift net, Dynamite Fishing, DDT fishing, Stow crayfish net.	Harmful
Akwa Ibom	a) Obianga/Lagos b) Inua Abasi	a) Stow crayfish net, Scoop net, Mosquito net, Net pickall, Bamboo pipe trap, Purse seine, b) Entangling drift net. Stow net, Dragnet, Cast net, Drift net, Purse seine.	Harmful "

