

FISH GEAR DESIGN AND PRODUCTION

FIS 304 LECTURE GUIDE

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FISHING METHODS IN NIGERIA

Fishing is an act of harvesting fish. Equipment or devices used for fishing are called fishing gears. The various types of fishing gears and the ways they are used on Nigerian waters are dependent on the following factors:

- Financial status of fisherman
- Seasons of the year
- Species of fish targeted
- Tribes of the fisherman
- Shoreline pattern
- Depth of the water

METHODS

- Traditional
- Modern

In almost every fishing community in Nigeria, nets from nylon are prevalently used. The netting materials are either monofilament or multifilament.

CLASSIFICATION OF FISHING ARTISANAL GEAR

Artisanal fishing gears are internationally classified as follows:

- Set nets e.g. gill net, trammel net drift net, etc.
- Surrounding nets e.g. beach seine
- Throw net e.g. cast net
- Hand net e.g. scoop net
- Lift nets e.g. Attala
- Clap net e.g. single clap net and twin clap net
- Traps e.g. trigger traps, non-return valve trap, ita trap, spring loaded traps, circular traps, bamboo trap, etc
- Electric fishing
- Brush parks e.g. Iken, acadja
- Wounding gears e.g. spears, cutlass & head lamp, etc.
- Basket and hand picking for small fishes and periwinkles
- Use of poisons and explosives e.g. Gamalin 20, dynamite, derris plant
- Hooks and lines e.g. spring loaded hook, long lining

Fishing gear could also be classified based on their methods of use:

- Active gear
- Passive gear

Active gear**Passive gear**

- | | |
|---------------|-------------|
| ○ Cast net | Gill net |
| ○ Beach seine | Trammel net |
| ○ Hand net | Drift net |
| ○ Clap net | Traps |
| ○ Lift net | Set hooks |

INDUSTRIAL FISHING TRAWLING

A fishing trawler is an industrial fishing vessel designed to operate fishing trawls. Trawling is a method of fishing that involves actively pulling a trawl through the water behind one or more trawlers. Trawls are fishing nets that are dragged along the bottom of the sea or in midwater at a specified depth. A trawler may also operate two or more trawl nets simultaneously, double-rig and multi-rig.

Variations in trawling gear

There are many variants of trawling gear. They are according to:

- Local traditions
- Bottom conditions
- How large and powerful the trawling boats are

Trawl variants include beam trawls, large-opening mid water trawls, and large bottom trawls (rock hoppers). Modern trawlers are usually decked vessels. Their superstructure [wheel house and accommodation] can be forward, midship or aft. Motorized winches, electronic navigation trawl sensors echo sounder and sonar systems are usually installed. Fishing equipment varies depending on the size of the vessel and the technology used. Also modern trawlers store the fish they catch in some form of chilled condition. Fish are stored with ice in the fish hold. Many of the trawlers also carryout some measures of onboard fish processing.

TYPES OF TRAWLERS

Trawlers can be classified based on:

- The architecture
- The type of fish they catch
- The fishing method used and
- Geographical origin

According to FAO, trawlers are categorized by gear as:

- Outrigger trawlers for shrimps
- Beam trawlers for flatfish fisheries.
- Otter trawlers
- Pair trawlers

- Side trawlers
- Stern trawlers
- Freezer trawlers
- Wet fish trawlers
- Trawler / purse seines
- Naval trawlers

CLASSIFICATION OF FISHING CRAFTS

(a). Canoes/boats - These are made either from wooden materials or synthetic materials such as roubber (PVC) or fibre-glass. hey could be operated with paddle or driven with an outboard engine. The wooden canoes could be dug-out or planked. These crafts are commonly used by artisanal fishermen.

(b)Vessels - These are commonly referred to as trawlers in the industrial fishery sector. They are used to pull or drag fishing gear.

GEAR SELECTIVITY

Selective fishing refers to a fishing method's ability to target and capture organisms by size and species during the fishing operation allowing non-targets to be avoided or released unharmed.

Selective types of gear

Fishing gear types and methods used in the tropics, some are extremely species selective. Even in waters where other species abound, their use does not create a complex management problem.

Selective types of gear:

<u>Gear type</u>	<u>species sought</u>
• Pole and line	skip jack tuna
• Mid trawl	sardine /mackerd
• Drift net	small tuna ,barracuda
• Tuna long line	large tuna
• Scoop net	shrimp, grey mullet
• Shell fish dredge	oysters, clams

Less selective gear type:

Fishing gear and methods which are less selective include most of the demersal fish trawls ,the seines and lift nets used in conjunction with light attraction or FADs (fish aggregating devices), and many of the artisanal traps ,line and tangle nets

Factors influencing selectivity of gear

1. Design and mode of operation
For instance in trawl net considering speed of tow headline height, ground contact , flow of water , otter door spread , length of ground cable , and mesh size .
2. Area swept — many types of bottom gear depend on the area of sea - bed swept for their effectiveness in fish capture. Ropes, wires, cable, and bridles are used to herd fish in the direction of the net. Several species of fish respond to herding by ropes, and possibly just as

many do not (e.g. prawn , clupeids shrimps and mackerel). Gear types that depend on sweeping a wide area of sea bed are bottom seines, pair trawls and otter trawls.

3. Effect of tickler chains and ground ropes: - the ground rope of a trawl net has an effect on the amount or proportion of flatfish and shellfish that may be caught. A heavy ground rope will tend to scrape tightly on the sea bed while a lighter one may travel more gently over the ground. The tickler chain is often used to dig up the sand just ahead of the ground rope. This drives flatfish and some shrimp and scallop up into the mouth of the net.
4. Mesh size: - this is very useful in purse seines than trawl net. Small fish caught normally have the likelihood of surviving and they may be allowed to go. The seines most times carry a filter panel at the top to permit the escape of small fish. The filter panel is 20 --25% larger than the other seine meshes. Some fish are gilled but they can be shaken out of filter netting. This could hardly be done if the larger mesh was used throughout the body of the net. The mesh size also affects the selective nature gillnet, but the net is loosely hung and large fish rarely escape capture. .
5. Season of year:- during cold weather or in the dry season, fish in most African lakes becomes very in activate. Their metabolism slows down to the point where they hardly move or eat. During such period they will rarely be caught by gillnet, unless they are driven -in as done in Ogun estuary and Epe lagoon.
6. Fish attraction method: - the three main methods of fish attraction are by light, by bait and by floating raft and artificial reef. Each method is selective under different conditions. The selectively is the product of the combined effect of the attractant, the fishing gear, the location and the method of application. Note also that secondary attraction occurs. Larger species come to prey on small fish congregating around the attractant. Most small pelagic fish in the tropics display positive photo-taxis e.g. Sardinella. Live bait fish are used for skipjack tuna for capture by pole and line. FADs attract pelagic fishes.

Reference:

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