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CRAFT AND GEAR

BY

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CERTIFICATE

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NARSAPUR

DEPARTMENT OF AQUACULTURE

CERTIFIED THAT THIS A BONIFIED REPORT OF PROJECT WORK ENTITLED IDENTIFICATION OF SOME CRAFT AND GEAR IN PERUPALLEM BY MOHAMMAD. ANARKALI AND GUBBALA. JAGADESH BABU OF BSC(FINAL) DURING THE ACADEMIC YEAR 2019-2020



SIGNATURE OF THE
HEAD OF THE DEPARTMENT

DECLARATION

I here by declare that this project work entitled Craft And Gear had be carried out by Mohammad. Anarkali and Gubbala. Jagadesh Babu. This work has not been submitted by any other student of aquaculture related disciples in the college.

Mohammad. Anarkali

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CRAFT AND GEAR

INTRODUCTION

The importance of fish as a source of cheap and nutritious food was recognised and the establishment of a department to develop the fisheries was initiated in 1899 under the Madras Province that was holding the administrative control of the Malabar area. In 1905, Sir .F. A. Nicholson was deputed to investigate the fishing industry and he in his first report to the Madras government he indicated the presence of vast shoal of pelagic fishes along this area. The crafts and gears used at that time was small and the fishermen spent most of their time and energy rowing to the fishing grounds and back. He recommended larger boats, which can go farther and do fishing for a longer time with carrier boats, which can take their catch quickly to the shore, while the larger boats could continue fishing. However, the improvements that Nicholson recommended in crafts and gears were not implemented to the indigenous fishery of Malabar area until the introduction of larger boats and nets by the end of 1980. For unloading the catches easily carrier boats became very common. The new modification with powerfbl outboard engines minimised the time in reaching the fishing ground and searching for shoals. The early sixties witnessed an important technological development, in gear, the shift from cotton to nylon nets. By mid sixties individual entrepreneurs entered the scene, paving way for a fast development of trawl fishery in coastal waters. The commercial purse seining started during late seventies and the process of large motorisation of country crafts begun in the early eighties. Fishing spread to deeper areas. Most of the recommendations by Nicholson in 1915 were effected these developments in relation to carangid fishery are briefly presented in this chapter.

The details of the crafts and gears used along the Malabar area were given by Govindan (1916), Hornell (1938), Rao (1970) and Yohannan and Balasubramaniam (1989 and 1991).

CRAFT

Traditional fishing Craft

Dug out canoes were the only crafts employed in the indigenous fishery of **Malabar** are prior to 1985. The dug out canoes were constructed by scooping out of a single log of wood. **Aini** (*Artrocarpus hirsuta*) was considered the best wood for this purpose. Mainly two sizes of canoes were in use. Bigger canoes had a length of 9.8 m costing Rs 250-400 in 1916 (Govindan, 1916). Smaller canoes of length 6.4 to 8 m costing from Rs 60-250 were also in use. The larger canoes were **mainly** used in the operation of boat seines with 6-7 persons. The smaller ones were in use for operating gill nets, cast nets etc., with a crew of 6-7 persons. Rao (1970) **has** given a detailed description of such canoes.

In Malappuram district, some plank built boats have been in use exclusively in an area between Kootai and Vadakkekadappurm in Malappuram district. These boats made of planks of **Aini** have a length of 9.5 m. These planks are fixed using copper nails and these boats are **mainly** used in the operation of boats seines in this area since a very long time (Plate 4.2.1).

In the other areas of Malabar coast, dug out canoes continued to dominate till 1984-85 period, when out board engines were introduced in the indigenous fishing industry (Yohannan and Balasubramnian, 1989 and 1991). It was the introduction of out boat engines to the canoes was a great revolution in the indigenous fishing industry. It provided enough speed and thereby increased efficiency, while labour was considerably reduced. To start with, the out board engines of 7.5 H.P. were fitted to the dug out canoes. Here, human labour power is substituted by mechanised power for propulsion. The engine is fixed to a bracket fitted on the starboard side of the craft. Most of the engines used in the earlier periods were **Yamaha** make. The fuel is kerosene oil, while petrol used for starting. The engine is removed from the craft as soon as it returns to the shore and fishermen carry the same to home where the engine is washed and decarbonised. The fishermen enjoyed the newly acquired speed and welcomed motorisation. By 1990, most of the country crafts of Malabar area were fitted with outboard engines.

In the mean time, due to prohibitive cost of wood, the dug out canoe became very costly. In 1986, plank built boats were introduced. These flat-bottomed boats with transom stern, where the out board engines can be fitted conveniently and more efficiently, became very popular. Later the plank built boats was coated with fiberglass for safety and durability (Plate 4.2.2). Then came the boats made of marine plywood coated with fiberglass which in 1992 was costing Rs 500001- This kind of boats with a length of 8.5 m, width of 1.55 m and depth of 80 cm became popular among the fishermen. The FRP boats are widely in use along the Malabar area and the cost of the boat with a length of 8.5 to 20 m in 2003 ranged between 1.25 lakhs to 5 lakhs. These boats are fitted with outboard engines of 40 H. P. A 25 HP outboard engine in 1993 was costing around Rs 80000/-, which consumed around 30 litres of kerosene and 3 litres of petrol for a day's operation. Another important event in the indigenous fishery of Malabar was the introduction of ring nets in 1988 (Sivadas and Balasub- 1989). As the net was large and heavy and needed more than 25 men for its operation, larger boats were needed. Kettuvallams were introduced in the area of this purpose. These large plank build boats had an overall length up to 20 m with a width up to 1.5 m. The plank build boats were fixed with coir ropes. These boats needed more powerful engines. It started with two 25 HP engines which became 3 later on. Then two 40 HP engines and one 25 HP engines were used. Some even used three 40 HP engines which in 2003 was costing around five lakhs. For a days trip all the three engines together require around 150 litres of kerosene and 2 liters of petrol. Recent trend in the revolution of FRP boat is the usage of inboard engine of 90 HP in the craft. Another engine of 40 HP is also kept to meet the need in the case of engine Mure.



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Mechanised fishing crafts

Trawlers use trawl net as fishing gear and are provided with marine engine of sufficient power to tow the net with the boat at appropriate speed. Trawl winches are fitted on the deck of these boats to operate the trawl net. Trawlers are operated along the Malabar area based at Puthiappa, Beypore, Kannur and Ponnani. Stem trawlers are the most common mechanised fishing craft operated along the Malabar Coast (Plate 4.2.3). In these vessels warp are led from blocks to the aft deck and over the stem. Towing blocks on small vessels are attached to the stem gallows and in larger vessels to a gantry. On stem trawlers, the wheelhouse is usually situated in the forward part. Medium sized and large stem trawlers are often fitted with a stem ramp on which the trawl is hauled on to the deck. The trawl, which is placed transversally behind the wheelhouse. Split winches are used on medium and large trawlers. On small vessels the fish hold is situated at amidships and on medium sized and large trawlers in the forward part of the vessel.

The size of the trawlers ranged between 32' and 58' in this area. The trawlers constructed from wood are commonly used for fishing operation in Malabar region. The cost of mechanised trawlers of 32' to 58' varied between Rs 6,00,000 and Rs 22,00,000 in 2003. For increasing the fuel efficiency, most of the mechanised fishing vessels are conducting multi day fishing operation of 6-7 days to save the fuel charges. The large trawlers conduct fishing voyages of 6-7 days while the small trawlers conduct the fishing for 1-2 days.

Mechanised gill-netters and purse seiners are not in operation along the Malabar region.

GEAR

Hornell (1938) had given details of the gear employed in the fishery of the Malabar area. Boat seines were the most important gear. Boat seines, gill nets and hook and lines were the important gear for exploitation of the carangids. The boat seines were made of cotton and hemp twine with a mesh size varying from 15 mm at the cod end to 35 mm at the mouth. By 1965-68, the synthetic twines were used for fabrication of nets, it replaced the cotton and hemp twines. Pattenkolli is a product of this important change. It is a boat seine made of nylon twine. As the mesh size was smaller, it was equally effective in the carangid fishery.

In the mean time, nylon twine was also used for making the gill nets, which is an important gear for carangid fishery since very long time. Rao (1970) gave the details of the gill net made earlier with cotton twines. Introduction of ring nets in the Malabar area is a major event in the history of fishing gear. This was **equally** important as the introduction of outboard engines in 1985. By 1991, the operation of boat seines was very much restricted for exploitation of fishes in the Malabar region including carangids.

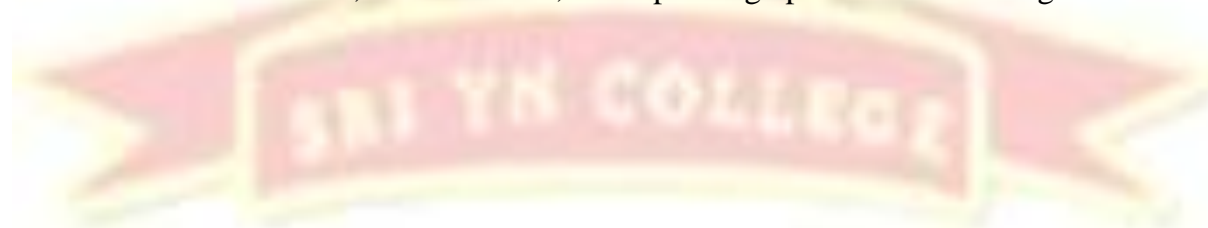
Trawl net

At present, the trawl net is the most important gear employed in the Malabar area.

Its operation starts in August and the fishing operations continue until the State Government imposes the ban on trawling at the onset of monsoon season.

The trawl that has become the most commonly used net in the fishing trade is primarily a bag net (Fig. 4.3.1). It is believed that it evolved from the dredge nets used in the clam and oyster fisheries. The earliest trawls, therefore, had a rigid rectangular head to which the bag was attached at one side and the towing ropes, on the other. They were primarily used for bottom dwelling fish like flat fishes. The vertical opening of the net is achieved through the floats attached to the head rope of the net. The horizontal stretch of the net was achieved by interposing on the two ropes, which are known as "otter board". These are rectangular board, either wooden or metal, to which the rope from the net and the towing rope from the boat are attached that the principle of parallelogram of forces acts upon them and when they are towed they fly apart in the water and thus help to keep the mouth of the net stretched. The use of the otter boards

gave the name of otter trawl to these nets. Naturally, these modifications and improvements led to bigger-sized nets. The manual hauling of the net as was done with the beam trawl was not possible especially with the introduction of the heavy otter boards. Thus, mechanisation was introduced in the form of strong winches, etc. The recent development in the trawling is the stern trawling where a sloping platform extends from the body to the stern end of the ship ending level with the sea surface. This enables huge, present day trawl nets to be dragged right into the body of the ship. Whatever was the method used for keeping the mouth of the trawl vertically open, it was found effective in catching fish only a few meter above the sea bottom. The depth of the trawl can be adjusted by varying the speed of the towing and also by adjusting the length of the warp the longer the warp, the deeper we the net would go, and shorter it was, the higher it would rise, thus doing away with the gadgets like depressors, etc. The adjustments of the depth at which the net was to be operated was only a hit and run chance till the developments of the eco-sounder-oscillator which, was fitted on the bridge of the ship shows the depth at which the net is being operated as well as density and the depth of the shoal. The diagrammatic representation of two different types of trawling operation is given in Fig. 4.3.2 and Fig. 4.3.3. Depending upon the number of days of operation by trawlers, these gears are classified into Multi Day Trawl Net (MDTN) and Mini Trawl Net (MTN). Multi Day Trawl Net is operated by the large trawlers, which go for voyage fishing of 6-7 days duration while the Mini Trawl Net is operated by the small trawlers, which conduct fishing operations of 1-2 days duration. The cost of the gear in Calicut in 2003 varied between **Rs** 15,000 and **Rs** 30,000 depending upon the size of the gear.



Ring seine

This is a kind of purse seine locally known as Ringuvala or Ranivala. In Kannur area it is known as Kuduvala' and in Kasargode as "Ranivala". It has an average length of 540 meter and a depth of 80 m. The major portion of the net is made of 113 nylon thread with a mesh size of 18-20 mm. The edges of the nets are made of meshes of 50 mm size to which the head rope and the foot rope are attached. The central portion of the net is made strong using 213 nylon thread to hold fast when heavy catch is hauled to the boat. This portion of the net extends to a length of about 35 m. In some nets, the ends are also made strong. The cost of the gear in 2003 varied between Rs 2,50,000 and Rs 4,00,000.

Plastic floats are attached to the head rope at regular intervals of 15-30 cm depending on the capacity of the float. Another piece of net with meshes of 50 mm is attached to the foot rope. Lead weights are attached to this net at intervals of 45 cm. The weight of the sinkers varies according to the depth at which the net is to be operated. The foot rope to which the main net and the small bottom piece of the net are attached is generally called by the fishermen as 'changala' which means the chain. The rings are normally made of brass. In some of the southern centers, plated steel rings were tried, but discarded later. Normally 3-4 rings are used per fathom of the net. Each ring weighs roughly 500 gms. A rope runs through the rings, which is the purse line. Usually one carrier boat also accompanies a ring net boat for carrying the catch to shore quickly while the unit continues fishing. Boats made of marine plywood coated with fiberglass with an overall length of around 9 m, width of 1.6 m and depth 90 cm are used for this purpose. A 25 HP engine is fitted to this unit. Now a days private carrier boat operators make this facility to the ring net operators, who do not own a carrier boat. They are normally given a percentage of the proceeds of the fish sales. A ring net unit goes for fishing with manpower ranging from 25 to 35. The number of persons depends upon the length of the craft used. The largest craft can accommodate up to 35 crews. As their number increased, hauling the net has become easier and quicker. There will be a minimum of 3 persons in the carrier boat.

With two engines of 40 HP, the units reach the fishing ground quickly. This gear is used to catch the shoaling pelagic fishes. The carangids are caught in this gear as a bycatch

or accidentally. **At** the sight of the fish shoal of sufficient density, one person (kutty) jumps into the sea with one end of the net and he should be a good swimmer. Some units provide a life jacket for Kutty for easy floating. The boat encircles the shoal very quickly paving the net. Kutty will alert the to fi-ighten the shoal into the net. After the shoal **is** encircled, the kutty is taken into the boat, along with the end of the net. Now the shoal is trapped in the huge well of net. The purse line is pulled to the boat slowly making the circle smaller (Plate 4.3.2). Finally, the catch is taken into the carrier boat, which rushed to the shore while the ring net unit goes in search of another shoal. Normally in a good season, the unit will continue fishing from morning till evening. Carangids are caught in ring seine in bulk quantities during the monsoon months. Ring net is operated from crafts fitted with out board engines and this unit is called Out Board Ring Seine (OBRs).

Gill nets

Gill net is a highly selective and passive gear of all fishing methods of the Malabar region. The simplicity of its design, construction, operation and its low energy requirement make the gear very popular in all the sectors. The gear is a vertical wall of netting, which is kept erect in water by means of floats and sinkers. The gear is mostly rectangular in shape whose upper end is mounted to a float line (Head Rope) and the lower end to a sinker line (Foot Rope) (Fig 4.3.4). The nets are operated in the surface, column or bottom layers of the water column in coastal and deep sea. Gill nets are used for capture of medium and large carangids and other pelagic fishes. When operated for such larger varieties in the deeper areas of the sea the nets extend to several kilometers. The fact that separates gill nets from all other types of **fishing** is that in gill nets the mesh of the net serves the dual function of selecting the fish to be caught and catching it. The capture of fish in gill nets depends on the net construction, its dimensions, and shape of the fish body. The gill net is made up of monofilament net pieces, each 35 m to 50 m long and 8 m to 12 m broad. Normally 20 to 40 such pieces are joined together depending upon the targeted species caught to make a single net. The mesh size varies between 35 mm to 152 mm. Floats are attached to the head rope and stone, baked clay or lead sinkers to the foot rope. Some times the sinkers will be tied to the foot rope with ropes of 1 m length to keep the net 1 m above bottom to avoid mud and unwanted debris

when the net is operated in the bottom.

Net repairs are made regularly when they are entangled in rocks and torn and the fishermen do it themselves. The engine and the boat need repairs after one or two year which is very costly. The engine and boat usually go as carrier boats for ring net units. The gill nets are used throughout the year for fishing operations with less intensity during the peak monsoon months. The costs of a gill net unit in the Malabar region vary between **Rs** 1,60,000 and 2,40,000 depending upon the size of the unit. The gill net units usually go for fishing in the after noon, reach the fishing area by sunset and set their net at the bottom as per the informations they received from the trawlers. Generally, the area will have a depth of more than 30 m The net is allowed to set across the current and in the path of fish migration. The method of operation varies with fishing condition, depth, area of operation and the species to be caught. Gill nets are operated mainly as bottom set, or surface net and as drift net. The soaking time of the net varies from **1** to **6** hours for drift nets and 12 to 24 hours for set nets. In set gill nets, both the ends of the gears are secured to bottom by means of sinkers or anchors. In *drift* nets, one end is tied to the boat and the other end with marker buoy and weights. The nets are shot mostly from the side and sometimes from the stern of the vessel. Hauling is generally done by the side of the vessel by **puling** the float line or head rope; the nets are cleared out and stored in the shooting position. While hauling, the anchor and the net are pulled over from the boat. Gill nets are operated from crafts fitted with or without out board engines. When it is operated from crafts fitted with out board engines, it is called Out Board Gill Nets (OBGN) and when it is operated from crafts without out board engine, that unit is called Non-mechanised Gill Net (NMGN).

Crafts normally used at present is a boat made of marine ply wood, coated with fiberglass, of size 9 x **1.6 x 0.8 m**. 25 HP outboard engines give the necessary sailing power. A few old dug out canoes are also used in the fishery now. Nevertheless, out board engines are used in most of the cases.

Other gears

Hooks and line (H & L) are also engaged in **hging** operations for rangids.

CONCLUSION

With all the utmost responsibility of exclusive involvement, We sincerely would like to end up here to conclude and submit our assessment of project assignment under the topic "CRAFT AND GEAR" from Aquaculture department to us its an enormous encouragement and support to accomplish our task of exaggeration and inspirational accuracy of playing a vital role of our to persuade the unidentified localities of the world to make them to attain a greater innovative achievement. we here to conclude our project working assignment with lots of blithe and with ritual submission of spirit.

Thanking You

















