



Major Fishing Gears of Azheecode Estuary and the Nearby Marine Habitat

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ABSTRACT

Fishing gears are the tools used to capture the aquatic organisms. The conventional wisdom of the fishermen population is used in the designing and operation of the tools to catch the fishes. The design of gear varied with the factors like mode of operation, environmental, social or legal considerations in the area of operation etc. A detail study of the fishing gears and its operation in the estuarine waters is a prerequisite for ensuring an economical as well as sustainable fishing with due consideration for all the factors influencing fishing activities at estuarine region. The study accounts the major fishing practice in Azhicode near to Azhikode – Kodungallur estuary.

INTRODUCTION

Kodungallur – Azhikode estuary is the place where the river Periyar meets with Arabian sea is found to be one of the diversified place of Cochin Backwaters. Kerala stands third position with a contribution of 5.85 lakh tonnes of total marine production in 2017, showed an increase of 5.6% compared to previous year .As the estuaries being the cradle of sub-adults or juveniles migrates between sea and river, the human interventions in exploitation of fishery resources as the fishing gears plays a crucial role in the sustainability of resources in the area. Fishing gears can be either active or passive gears. The one which is dragged through the water by manually or by engine power is termed as active gears which is more efficient than passive gears in most cases. For instance, spears and harpoons are one of the most ancient ways of active fish capture. On the other hand, passive gears are stationary gears which are left somewhere for a period, like gill nets, traps and hook and line. In addition, the gears get classified based on the gear structure in the International Standard Statistical Classification of Fishing Gear(ISSCFG).

Material & Methods

The study was conducted in Kodungallur – Azhikode estuary (10°11'-10°12' N and 76°10'-76°13' E) which is the northern most point of Vembanad lake. Randomly selected fishermen engaged with different fishing activities in and around the Azhikode estuary for the questionnaire survey. Collected information on the working of different fishing gears by interacting with the fishermen and fishing gear design survey conducted.

Purse Seine

Purse seine is one of the most efficient and advanced fishing methods. Operation of purse seine nets have been reported in Kerala coast from late 1978 with 10 units of purse seine gear in Cochin Backwaters (Jacob *et.,al*,1982). It mainly aims at the pelagic schools which can be identify by our naked eyes, In shallow waters the fishermen uses their convention wisdom in finding the

schooling pelagic fishes by observing the change in the colour of patches or bubbles developed by schooling fishes while acoustic fish detection using echosounders done at deeper water.

A purse seine is a long net with float line and lead line in the upper and lower edge respectively with hanging purse rings through which a purse line which is normally a rope runs through, to pursing the net during the operation. Generally purse seines are used in purse seiners of about 90-95 feet, accommodating a maximum of 30 workers. Small scale operations are also possible with small purse seiners. The boat which assist in purse seining locally known as 'dingi' is introduced in to water to help in encircling the school immediately after identifying the schools by the fishermen. The dingi boat with two fishermen onboard carries an end of purse seine net and meanwhile the large boat encircles the shoal at greater speed so that the school will get entrapped inside the purse formed by the purse seine net. The gear can be made into purse as the purse line is hauled in with the help of purse line which commonly known as Pursing. Another technique held in this is the collection of fish. The moving Derrick will come over the purse seine net and the collecting net ('maali' in fisherman language) hanged in the derrick with the help of two pulleys will get loaded manually. The base of the collecting net loaded with catch will untie on wherever they want to deposit it.



Fig.1 Model of a Purse seine net

Trawl Net

Trawl nets are used in trawlers, either in side trawlers or stern trawlers. They vary in size from small open boats to large factory trawlers. Side trawlers are operated in very far fathoms while stern trawlers are in commonly used. The trawl net will vary in accordance with the targeted species. Trawl is a bag net towed through water to caught the fishes, the mouth being open throughout the operation. It is the otterboard (used in pairs), which keep the mouth of trawl horizontally open during towing. The otterboard is attached to the winch with the help of warp wires. The length of the warp wire will differ on how deep the trawl operation is done. It is the responsibility of the captain ('srank') to guide the workers. In a trawler of 80 feet, accommodates about 10 workers. The operation starts when the trawl net is attached to the stern side (to the winch) and the net will throw into the water. The vessel will start to tow, the maximum towing time is 2 hours and about 4 towing will take place in a day. During the towing, the fishes will accumulate in the cod end of the trawl which can be collected at the end of the process.

**Fig.2 Towing of trawl net****Fig.3 Towing operation****Fig.4 Structural model of a trawl net**

Gill Net

The gillnet fishing is a traditional practice of fishing by the artisanal fishermen of Kerala. Commercial fishing with gillnets can also be found both in Inland and Marine sectors. It is generally a night based fishery since the fishes are mostly pin down or entangled in gillnet during night time.

The gillnets are long (about 500 fathoms) nets made of vertical panels of netting that hang from a line having floaters at regular intervals and the bottom line of the net is normally weighted with lead. Gillnets differ in its mesh size, color and the type of filament with which the gillnet is made. A small vessel (gill netter) carrying 5 workers will start the operation at about '5' in the evening in such a manner that one end of the net will be in the vessel and the other end will be far away (500 fathoms- the length of the net), with a flag to recognize the end of the net and the main body of the net will be simply lay in the deep like a wall. Once the fishes got pass over there, will entangle in the twines (either the gills or fins). The workers will then pull the net at morning '2' in the morning to finish the operation since the hauling of net to the vessel is a time consuming process. The fishes caught in the net are removed manually.

**Fig.5 Structure of gillnet****Fig. 6 Structure of surface gillnet**

Chinese Dipnet

Chinese dip nets is the dominant fishing gear along the Azhikode – Kodungallur Estuary. Chinese dipnets in Kerala coast are introduced by the Portuguese (Pillai *et.,al.* 2016).It is a stationary fishing gear which is operated manually by two people in earlier but later it has replaced by lever mechanism. It has been found that the highest amount of catch is recorded during rainy season especially during high tide attracts since the rigorous water mixing happen during high tide attracts more fishes to the estuarine region.

The fishermen engages with the fishing operation during morning and evening. The dipnet fishery is a light assisted fishery and hence a central light is provide in the supporting structure of dipnet which throws the light over the water surface during operation as the face of electric bulb comes parallel to the water surface when the gear is lowered for soaking in water. The lights at night attract the fishes towards the centre of net and sometimes baits are also provide inside the netting to attract the fishes. After soaking the net for a course of time usually 10 minutes, the net is raised with the help of supporting structures and the fishes are get collected at the codend of the gear. In order to collect the fish from the codend, the worker will pull a rope which is tied at the base of the dipnet, and gather them using a scoop net. In many region a cage is constructed near to the dipnet and the undersized fishes caught in the gear is kept in the cage and are reared up to the market size. The Chinese fishing is regarded as the sustainable fishing practice with minimal environmental impacts to the ecosystem (Chandrasekar *et., al.* 2020).



Fig.7 A worker pulling the codend to collect fish Fig.8 Dipnet under operation

CONCLUSION

The fishing gears may vary in different region based on the traditional practices and the habitat of that area. This will range from traditional fishing practices to profit oriented methods. The studies related to these will enable us to reach a sustainable fisheries sector. Studies focusing on a particular habitat will help us to understand about the fishing practices in more detail.

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