

Mini-trawls for Estuarine Fishing in Kasargod District

M.P. Remesan and A. Ramachandran*

Central Institute of Fisheries Technology
Cochin - 682 029, India

Mini-trawls are operated by the artisanal fishermen from small wooden non-motorised canoes. Shrimp, fish and crab trawls with head rope length ranging from 3.5-8 m, made of Polyethylene monofilament (PE) twisted and Polyamide multifilament (PA) rigged to 6-7 kg flat rectangular wooden otter boards are common in the lower reaches of Kariangode and Chandragiri rivers. Since the trawling speed is less, catch is dominated by crustaceans. Less scope ratio also may be affecting the catching efficiency of the gear. This paper deals with the design, operation and economics of mini trawling carried out by a group of fishermen in the above rivers of Kasargod district, Kerala state.

Key words: Mini-trawl, inland fishing, Kasargod.

Kasargod, the northernmost district in Kerala, has a coastline of 70 kms, extending from Thrikaripur to Bengaramanjeshwaram. There are 12 west flowing rivers and 3174 ha of backwater area in the district. Total number of inland fisher folk population is about 926 and total inland fish production was 57,516 metric tones (Anon, 2001).

Chandragiri and Kariangode are the two major rivers in the district in which a variety of fishing gears including mini-trawls are in operation. In some parts of Kerala and Karnataka otter trawls are operated from a dug-out canoe, close to the shore by two men (Ramamurthy and Muthu, 1969). Design and operational efficiency of a mini-trawl net for capturing demersal fishes and prawns in Netravati-Gurpur estuary at Mangalore has been described by Sheshappa, (1978). Sathyanarayanappa et al. (1987) described the design and operation of mini-trawls for estuarine fishing in Karnataka.

Trawling in river estuary has also been reported by Liggins & Kennelly (1996) and in Ashtamudi estuary by Muralikrishna & Onishi (2002). In New South Wales, Australia, estuarine prawn trawling occurs in five locations and is valued at approximately Australian Dollar 7×10^6 per annum (Broadhurst et al., 1996).

Mini-trawls are usually operated in the sea by the artisanal fishermen from motorized craft. Vijayan *et.al.* (1990) field-tested a 12.77 m two-seam trawl net designed for operation from 8.4 m OAL dugout canoe with 11 hp outboard engine. Operational efficiency of ring seines and mini-trawls, has been given by Edwin & Hridayanathan (1997). Comparison of catches in 4.3 m and 12.2 m shrimp trawls was made in the Gulf of Mexico by Cody & Fuls (1986) and small trawls in juvenile flatfish research by Kuipers, *et al.* (1992).

* Present address: Registrar, Cochin University of Science and Technology, Cochin - 682 022

Mini-trawl operation in the estuarine systems of north Kerala has not been reported by any workers in the past. About 10 fishermen are engaged in mini-trawl operation throughout the year in Thaikadapuram area of Kariangode river. During monsoon season, when the sea becomes rough, more number of fishermen venture in trawling. Azhithala, Madakara, Mayilakadapuram, Ochanthuruthe and Purathekkai are the main centers of mini-trawl operation. In Chandragiri river, Thalagara and Kadapuram are the centers of mini-trawl operation and about 20 people are involved in this type of fishing method.

The present paper deals with the design, operation and catch details of mini-trawls operated in the district.

Materials and Methods

Data on the design, fabrication, operation and catch particulars of mini-trawls were collected from the main fishing villages in the lower reaches of Kariangode and Chandragiri river. Details on the net were collected by examining representative samples, and also from the local net makers. Trawling was observed from a few fishing centers.

Net is operated from wooden canoes of size ranging from 4 to 5 m. Two fishermen are required for the operation. Crab trawls are operated mainly during December & January, which coincide with the migration of seawater crabs to the estuarine areas. Net is operated usually during low tide and most of the fishermen operate the net during early morning. 120-150 m long Polypropylene (PP) rope having 10 to 15 mm dia is used for the

propulsion of the canoe. One end of the rope is tied to the front beam of the canoe and the other end to a 15-18 kg anchor.

On reaching the ground the anchor is thrown in the water and the canoe move away from the anchor, along the direction of current, till the rope is released completely. The gear is shot, dropping the cod end first, followed by the main body and wings of the net. As the second person starts hauling the anchor rope from the other end, the boards are released (Sheshappa, 1978). Warp line released varies from 5 – 10 m more than the depth of water. When the net mouth is opened properly the boat is kept moving, in order to keep the gear in the fishing position. Propulsion of the canoe towards the direction of anchor while dragging the net against the current is shown in Figure 1. On reaching the anchor the canoe is stopped and the net is hauled up manually. After retrieving the anchor the catch is removed and the process is repeated. Each haul requires 20 to 25 min and they spend 4 to 5 h per day. Depending on the catch they shift the ground.

Results and Discussion

Based on the target group, three types of trawls are in operation namely fish, shrimp and crab trawl. The head rope length of fish trawls ranges from 3.5 to 8 m, whereas in case of shrimp and crab trawls it ranges from 3.5 to 7 m. Ramamurthy and Muthu (1969) reported the operation of trawl nets with head line length of 7-27 m between the upper wing ends. Mesh size for the fore parts of fish trawl is 30 mm and it is 22 mm

20 APR 2005
PARANGIPETTAI

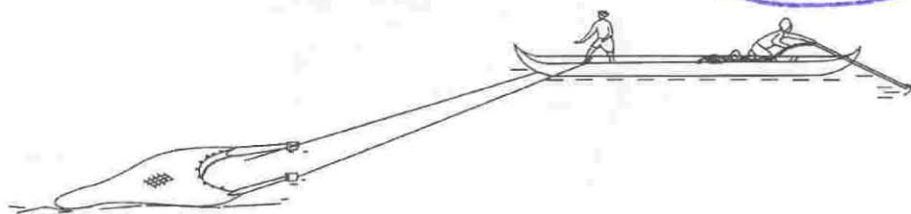


Fig. 1. Propulsion of the canoe using rope and anchor

and 40 mm for shrimp and crab trawls respectively. Cod end mesh size for all the three trawls ranges from 10 mm – 18 mm. Details of these nets are given in Figure 1, 2 & 3 (The figures are not drawn to scale). PE webbing with 0.5 mm twine size is generally used for fish and shellfish trawls.

Few fishermen use PA multi filament (210x1x2) webbing for shrimp trawls. Usually 6 mm dia PP rope is used as head rope and footrope. Four to seven PVC (50x20 mm) or plastic floats are used in the head rope. Some fishermen use a large plastic float (8-10 cm dia) in the center. Total weight of

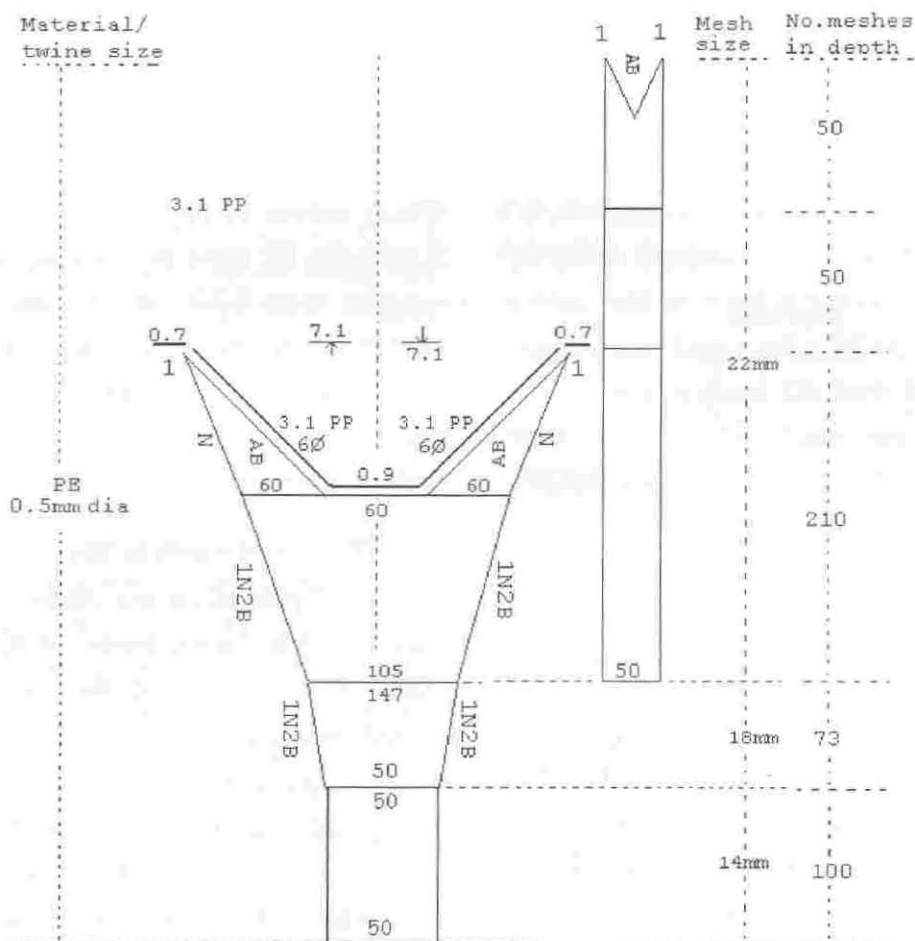


Fig. 2. Design of a 7.1m shrimp trawl from, Kariangode river

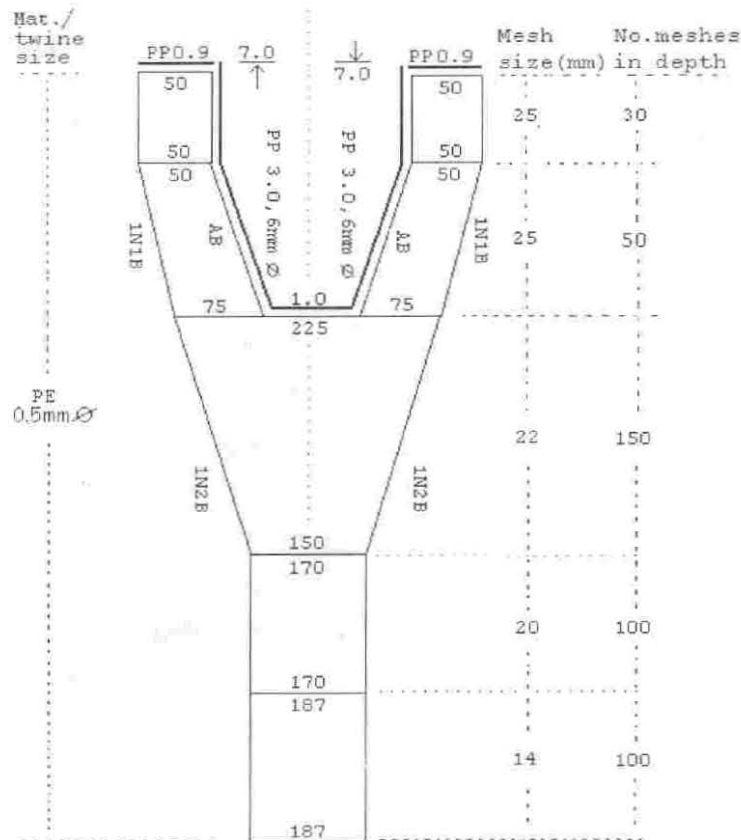


Fig. 3. 7.0 m fish trawl from Chandragiri river

sinkers in the footrope ranges from 2 to 4.0 kg. 60-80 small spherical sinkers of 15-20 mm size, each having a hole in the center and weighing 30-50 g are used. Sheshappa (1978) reported that 60 lead sinkers, each weighing 50 g, are attached to the foot rope of a trawl net with 3.5 m head rope length. A twine is inserted through the hole and the same is tied to the footrope at about 10 cm intervals, except in the middle of the rope, where it is closely arranged to have sufficient bottom contact.

The net is rigged to flat wooden rectangular otter boards of size 37-40x20-22 cm, each weighing 5 to 6.5 kgs (Fig.5). Rings are fixed either on the edge or backside of the boards. Head rope and footrope is extended to 50 to 70 cm, on either side,

which serves as legs. 20 to 30 m long, 6 to 8 mm dia PP rope is used as warps. Ropes ranging from 8-12 mm are used in place of warps for trawls operated from motorized craft (Vijayan *et.al.*, 2000). One end of the bridle is attached to the bracket and the other end to the end beam of the canoe.

Maximum catch is obtained during the migration period of sea crabs. During peak season catch varies from 10-50 kg, mostly crabs. For the rest of the period catch is constituted by prawns like *Metapeneaus dobsoni*, *M. monoceros*, *Peneaus indicus* and mainly three groups of fish, *Cyanoglossus sp.*, *Glossogobius giuris* and *Platycephalus sp.* *Scatophagus sp.*, and *Mystus spp.* are also caught. Since the trawling speed is less, fast moving fishes can easily avoid the trawl path

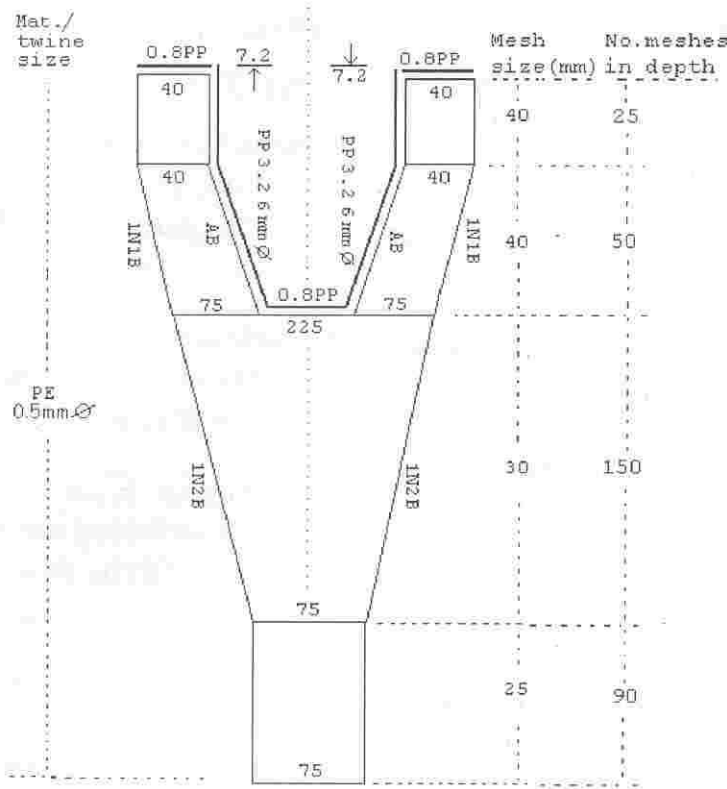


Fig. 4. 7.2 m two-seam crab trawl from *Mayilakadapuram*

and that may be the reason for less variety in the catch.

On an average 30-40 kg of crabs are landed per canoe a day during season. Clams, mud crab and other bottom dwelling fishes also contribute to the catch. Sea crabs fetch Rs. 20 to 30/kg during peak season. Income per day varies from Rs. 50/- to 500/- per head.

According to the mini-trawl fishermen in Kasargod catch is declining due to various anthropogenic activities. Total number of fishing units has increased in the lower reaches of the river. Sand mining, aquatic pollution, fish disease and fishing using small meshed nets are some of the reasons cited. During summer season the river mouth becomes partially cut off due to erosion sand deposition, which is also adversely affecting the migration of several fishes to the estuarine area.

Fish production can be improved by introducing proven designs of mini-trawl nets. But the impact of this type of fishing

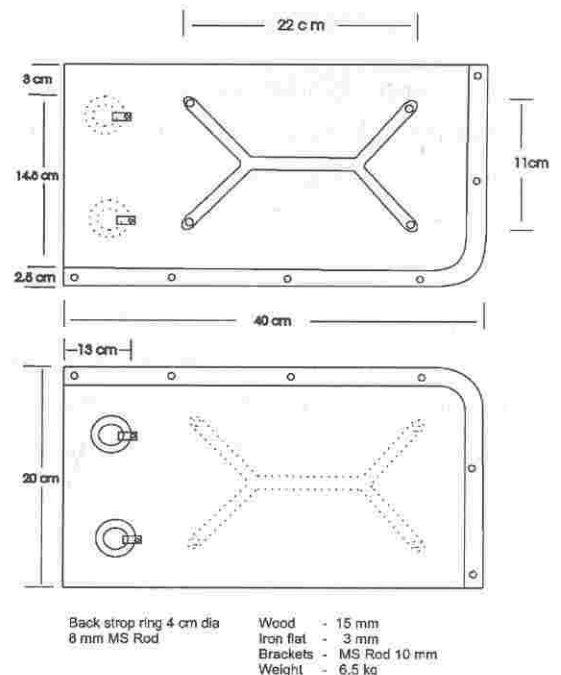


Fig. 5. Wooden flat rectangular Otter boards

method in sensitive areas like river mouth need to be studied to evolve management practices like closed seasons, closed areas and mesh size regulations.

The authors express their thanks to the Director, School of Industrial Fisheries, Cochin University of Science and Technology, Cochin for the permission to publish this paper. Thanks are also due to the Director, CIFT for granting study leave for the first author, and to Dr. P. Pravin, for critically going through the manuscript.

References

- Anon (2001). Panfish Book, Kasargod district. Department of Fisheries, Kerala state.
- Broadhurst, M.K., Kennelly, S.J. and Isaken, B. (1996). Assessment of modified codends that reduce the by-catch of fish in two estuarine prawn trawl fisheries in New South Wales, Australia. *Fisheries Research*. **27** pp 89-111.
- Cody, T.J. & Fuls, B.E. (1986). Comparison of catches in 4.3 m and 12.2 m shrimp trawls in the Gulf of Mexico. *Fish. Bull.* **84** (4), pp 981-990
- Edwin, L. and Hridayanathan, C. (1997). Operational efficiency of two major artisanal fishing gear of Kerala. *Indian J. Fish.* **44**(4) pp. 409-412
- Kuipers, B.R., Maccurrin, B., Miller, J.M., Veer, Vander, H.W. & Witte, J.I. (1992). Small trawls in juvenile flat fish research: Their development and efficiency. In: Proceedings of the first international symposium on flatfish ecology. part 2: **29**(1-3), pp 109-117
- Liggins, G.W. & Kennelly, S.J. (1996). By catch from prawn trawling in the Clarence river estuary, New South Wales, Australia. *Fisheries Research*. **25**, pp 347-367
- Muralikrishna, M. and Onishi, Y. (2002). Mussel Muscle: Resource management *Samudra*, pp 19-21
- Ramamurthy, S. and Muthu, M.S. (1969). Prawn fishing methods. In: Prawn Fisheries of India. *Bull. No. 14*, C.M.F.R.I., pp 234-257
- Sheshappa, D.S. (1978). The design and operational efficiency of a mini-trawl net for capturing demersal fishes and prawns in estuaries. *Mysore J. Agri. Sci.* **12**, pp 618-621.
- Sathyanarayanappa, S.N., Sheshappa, D.S., Salian, P.K. and Hanumanthappa, B. (1987). Estuarine fishing gear and crafts of Karnataka. *Proc. Natn. Sem. Estuarine Management*, Trivandrum. pp 234-238.
- Vijayan, V., Edwin, L. and Ravindran, K. (2000). Conservation and management of marine fishery resources of Kerala State, India. *Naga*, the ICLARM Quarterly. **23**(3), pp 6-9
- Vijayan, V., Varghese, M.D. and Pillai, S.N. (1990). Evolution of an improved trawl net for artisanal craft. *Fish. Technol.* **27**, pp 83-86