

Ring Seines of South Kerala Coast

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Ring seine or mini-purse seine is currently one of the prominent fishing gears in the artisanal fishery sector of Kerala. Since its introduction in mid-eighties, the ring seine has caused displacement of gears such as *Thangu vala*, operated from the traditional boat seine craft, *Thangu Vallam*. The design and operational features of the ring seine prevalent in the Alleppey - Cochin coast have been described in this paper along with a review of the important changes that have taken place in the design and operation of the gear, since its introduction.

Key words : Ring seine, min-purse seine, *Thangu vala*, artisanal fisheries, Kerala

The beginning of 1970s witnessed the introduction of mechanised trawlers in the Kerala fisheries scenario. The indiscriminate proliferation of trawlers since then, reduced the contribution of the artisanal sector from 89.4% to 51.8% (Anon, 1989). The motorisation programme of traditional craft was introduced by the Kerala Fishermen Welfare Corporation during 1979-80, in the Alleppey region. This motorisation paved the way for introduction of competitive fishing gears for the benefit of artisanal sector. Central Institute of Fisheries Technology (CIFT) developed and introduced a mini purse seine, popularly known as ring seine during 1982-83 (Panicker, *et al.* 1985). This development offered an efficient alternative gear for operation from the boat seine craft *Thangu Vallam* in the artisanal sector. Along with CIFT's introduction and popularisation of ring seines in Cochin and Kasargod areas, other developments were initiated by fishermen (Rajan, 1993) contributing to easy acceptance of ring seines.

Since its introduction, the number and size of the ring seines have continued to increase, necessitating heavy capital investment. Estimates show that about 2,400 ring seines are being operated along Kerala coast (Anon, 1992). The transition from the

traditional boat seine, *thangu vala* or *koru vala* operated from *thangu vallam* (traditional boat seine craft) to the present-day mini-purse seine or ring seine, in the Alleppey-Cochin region, has been reviewed in this paper with special reference to changes that have taken place in its design and operation.

Design, size and types of the gear

The ring seine comes under the class of encircling gears (Brandt, 1972). It has three main parts viz., the central bunt portion (*adi vala*) and two wing portions (*kaivaram*) on either side of the bunt. The bunt portion is made of horizontally placed rectangular pieces of webbing. The wing portions are made up by adding rectangular pieces of webbing vertically on both sides of central bunt portion. These vertical pieces decrease in length from bunt side towards wing-ends. In earlier versions of ring seine, this was effected by reducing 100 meshes for every vertical strip from the bunt (Panicker *et al.*, 1985). The main body of the webbing is attached to selvages (*chuttu vala*) along the top and bottom edges, the former in turn being attached to the float-line and the latter to the sinker line and rings with bridle arrangement for

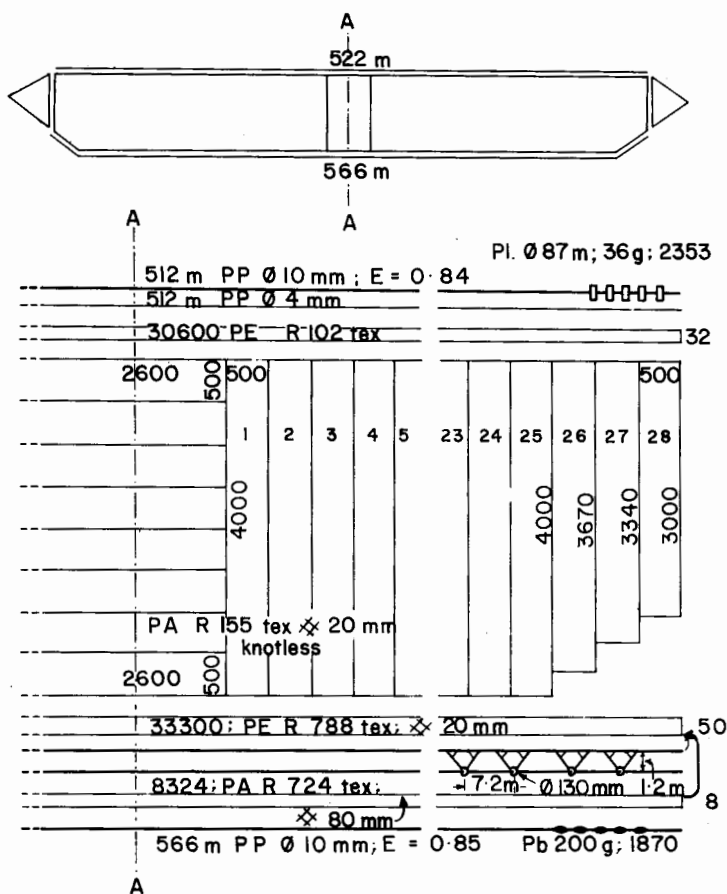


Fig. 1. Design details of a ring seine from Alleppey - Cochin coast.

pursing. The presence of pursing arrangement makes it functionally distinct from traditional *thangu vala*. The material used for construction is knotless nylon webbing in place of cotton webbing used in traditional *thangu vala* of yester years.

Ring seine designs in vogue in the fishing centres of Alleppey and Cochin are largely a rectangular wall of netting (Fig. 1) Reduction in depth is brought about only at the extreme ends leaving about 90% of the total length of the net with uniform depth unlike the purse seine described by Panicker *et al.* (1985) where uniform depth

is limited to the bunt portion which is only about 10% of the total length of the net.

A typical cotton *thangu vala* of the early sixties had a length of 42 m and depth of 5.2 m (Kurian *et al.*, 1962). First ring seines introduced in the eighties typically had an average length of 250 m and depth of 30 m (Panicker *et al.*, 1985). The gear has changed enormously in dimensions over a decade of its usage.

At present there are two types of ring seines in the Alleppey-Cochin area. The larger ring seine, locally known as *thangu*

vala, typically has a length of about 540 m and depth of 72 m. The biggest of this type observed at Alleppey during the period of study had a length of 630 m and depth of 100 m. The larger ring seine has a mesh size of 18-20 mm and is used for catching sardines, mackerel and prawns. The smaller ring seine, locally known as *chooda vala* or *disco vala* measures 250x30 m, has a mesh size of 8-10 mm and is used for catching anchovies. This gear is considered to be a subsidiary of larger ring seine (Rajan, 1993). The larger ring seine (*thangu vala*) is operated throughout the year where as the smaller ring seine (*chooda vala* or *disco vala*) is mainly operated during monsoon.

Size of craft and motorization

The craft from which *thanguvala* was operated was termed *thanguvallom*. The *thanguvallom* reported by Kuriyan *et al.* (1962) had a length 11.8-13.0 m and breadth 0.9-3.3 m. Reports of the South Indian Federation of Fishermen's Societies (SIFFS) indicate that between 1985 and 1988 the size of ring seine craft increased from 13.0 to 16.0 m in the Alleppey region. The breadth of these crafts were 1.30 m and depth 1.25-1.40 m. Currently, *thanguvalloms* operate with a smaller carrier vessel. The dimensions of a representative *thanguvllom* are: length 20.2 m, breadth 2.35 m and depth 1.13 m. The carrier had an average length of 12 m. With the introduction of outboard motors fishermen started going for engines of 20 hp and 24 hp or two engines of 12 hp each (Anon, 1989). Today, large *thanguvalloms* use 2 engines of 25 hp each or a 25 hp engine along with a 40 hp engine. The carrier is fitted with a 15 hp engine.

Method of operation

The gear is operated using the basic principle of encircling the shoal. The operation of the net now requires 30-35

persons in place 11-14 crew of the smaller *thanguvalloms*. On locating the shoal the craft increases speed to reach ahead of the shoal and quickly encircles the shoal while dropping the net. The bottom is pursed immediately by hauling the purse line. The catch is emptied and transferred to the carrier vessel for disposal. The main vessel may stay for further hauls or may return to the shore.

Depth of operation

Due to the overcrowding of the artisanal units in depths less than 20 m, ring seines opt for operations beyond this range. According to Sivadas & Balasubramaniam (1989) the gear is operated up to a depth of 45 m. The motorised plank canoe with encircling net operated on an average of 9 m depth during 1980-1981. The ring seine introduced by CIFT was meant to be operated from 15 m depth. Studies conducted by SIFFS showed that ring seiners went up to a maximum depth of 40 m (Anon, 1991). With the use of powerful engines and lack of substantial catch in the inshore waters fishermen of Cochin and Alleppey venture to depths of up to 45 m during day time and up to 55 m while they go for fishing at night.

Catch composition

The ring seine is targeted at shoaling pelagic fishes like mackerel, sardines and anchovies. The predominant species caught in ring seines according to surveys conducted by SIFFS were oil sardine (49%), mackerel (9%), anchovies (17%) and prawns (3%). During 1989, in the total landing of Kerala about 10% of oil sardine, 48% of anchovies, 60% of other clupeids, 72% of Indian mackerel and 27% of penaeid prawns were accounted for by the ring seines (Sathiadas *et al.*, 1993). Though prawns are caught incidentally, the economy of the ring seines ironically are precariously

perched on prawn catches. As against the observations during the previous years oil sardines were not landed in Cochin during the post monsoon period. The main species landed during 1994 were mackerel, rainbow sardines and anchovies in Cochin and mackerel, lesser sardines and oil sardines in Alleppey.

Ever since the introduction of the ring seine units, the craft and gear have been subjected to modification and the size of units have been increasing (Anon, 1991). Further, the number of units have increased drastically. James (1992) has warned that the ring seines in operation are bringing about drastic changes in the fishing pattern, catch composition, seasonal abundance, socio-economic problems, etc. According to him the operation of ring seines have to be carefully studied with regard to aspects such as resource sharing, economics, profitability, number of units to be deployed, seasons of operation, conservation of resources, etc. Besides, there is an urgent need to identify an optimal size of the unit and define the optimum number of units (Achari, 1992). The Expert Committee on Marine Fisheries had suggested in 1985, that the future growth of motorised canoes be planned taking into consideration the potential fisheries in fairly deeper waters as yet underexploited viz., resources such as white baits, perches, carangids, ribbon fishes, cat fishes, sharks, cuttle fishes, etc. (Kalwar *et al.*, 1985). Nair (1989) recommended that no ring seine with more than 250 m length and 35 m depth be allowed to operate with gradual phasing out of the gear. Although the ring seine was banned under the provisions of the Kerala Marine Fisheries Regulation Act 1980, this gear has come to stay. The ever increasing size of the gear, the craft and power of the engines and sporadic heavy landings are not indicators of the efficiency of this craft-gear combination. The technical

and economic efficiency of this gear therefore, needs to be studied in detail.

The first author wishes to thank Dr. K. Gopakumar, Director, Central Institute of Fisheries Technology, Cochin for granting study leave and Dr. M. Shahul Hameed, Professor and Head of the Department of Industrial Fisheries for the help and encouragement given.

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