

NOTE

Optimization of the Length of Trawl Cod-end

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A study was undertaken to standardize the size of cod-end in trawls. Observations were made with cod-ends of 3 different lengths. The comparative catch efficiency of individual cod-ends when attached to a 32 m fish trawl was assessed. The results showed that 6 m cod-end was superior to the other two cod-ends (4 m and 8 m) with respect to the landings of quality fish.

Key words: Trawl, cod-end length, optimization

A survey on the design of trawls in vogue along the west coast of India showed that the size of cod-end was not uniform and its length varied from 4m to 9m. Since the length of cod-end influences the behaviour of fish caught and consequently the efficiency of the trawl, there is a necessity to find out the optimum length so as to have maximum catch. The shorter cod-end facilitates easy escape of fish by turning back, whereas increase in length causes distortion of the cod-end, and often the entry into the cod-end is also disrupted resulting in less catch.

Even though there had been studies to establish the interrelationships of various parts of the trawl, no attempt was made to determine the optimum cod-end size. Nair & George (1964) have worked out the relationship of various parts of trawl with belly width, based on their survey of different designs of trawl operated off Cochin. A similar study was made by Kartha *et al.* (1990) on the double rig trawls operated from Visakhapatnam. The optimum depth of trawl belly was determined by Mhalathkar & Iyer (1966) and Mhalathkar & Jagatheesan

(1970 & 1971). Nair *et al.* (1971) carried out investigations on the length of overhangs and Satyanarayana *et al.* (1976) studied the efficiency of long wings in trawls. Reeves *et al.* (1992) observed that parameters like diameter, extension length and mesh size in cod-end have significant effect on selectivity. The present study was undertaken to assess the influence of cod-end length on the catch efficiency of fish trawls, so as to optimize its size.

Detachable cod-ends of 4 m, 6 m and 8 m were fabricated with 1.5 mm PE twines. The mesh size was 30 mm for all the three cod-ends. Fishing trials with a 32 m fish trawl attached with the three cod-ends on regular rotation and in combination with 'V' form boards (1500 x 850 mm size), weighing 130 kg each were carried out from MFV Matsyakumari (17.5 m OAL) and MFV Sagar Sakthi (15.24 m) at a depth range, 10-24 m, off Cochin during the period of February to December 1996. Keeping all the parameters constant, 36 hauls of 1 hour duration each were made for each combination and the catch data in respect of quality fish and miscellaneous fish were collected.

Compiled catch details in respect of each cod-end are given in Table 1. It was observed that 6 m long cod-end landed maximum quantity of quality as well as miscellaneous fishes followed by 8 m and 4 m cod-end.

Table 1. Details of catch in different lengths of cod-end

Length of cod-end	No. of hauls	Catch details	
		Quality fish (Pomfret) (Nos.)	Miscellaneous fish (kg)
4.0 m	36	258	328.0
6.0 m	36	578	330.0
8.0 m	36	528	325.0

Statistical analysis of the data was carried out separately for miscellaneous fish and pomfrets. The statistical analysis of miscellaneous fishes using ANOVA technique (Table 2) showed that there was no significant difference in the catch of miscellaneous fishes between different cod-ends.

Table 2. ANOVA of miscellaneous fishes caught in different cod-ends

Source	SS	Df	MS	F
Total	246.19	53	-	-
Days	166.02	17	9.77	4.61
Cod-ends	7.31	2	3.67	1.71
Error	72.83	34	2.14	-

In the case of pomfrets, χ^2 test was employed to find out whether the differences in catch of quality fish were significant. The χ^2 value was 149.11 for 2 degrees of freedom, which was highly significant ($p < 0.001$). Significantly higher

numbers of pomfrets were landed by 6 m long cod-end, followed by 8 m cod-end. So it can be conclusively stated that there is significant increase in the catch of quality fish (pomfrets) while operating the net with 6 m cod-end.

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