

PRELIMINARY OBSERVATIONS IN THE DESIGN AND OPERATION OF A THREE PANEL, DOUBLE TRAWL NET

A. V. V. SATYANARAYANA & G. NARAYANAPPA*
C. I. F. T. Sub-station, Kakinada-2

Fishing operations were conducted off Kakinada using a three panel double trawl net with twin codends to study the utility of the net in catching both bottom and off bottom fishes. The observations indicate that the net is effective in simultaneous catching of bottom as well as off bottom fishes and separating them while in operation. The design details of the net and the particulars of the fishing operations conducted are presented.

INTRODUCTION

Although otter trawling is now an established commercial fishing method off Kakinada coast, the gear, particularly the net, is still being subjected to modifications and improvements for the capture of different fish under varied sea conditions (Sebastian, Sadanandan and Satyanarayana, 1965; Narayanappa, 1968; Sreekrishna, 1970 and Satyanarayana, Narayanappa and Narasimharaju, 1970 & 1972). In the present study based on Dickson's (1959) trials with two separate nets mounted one above the other, a horizontal panel was introduced in between the top and bottom belly of a two panel net. The design details of such a

net and the results of the preliminary fishing experiments with the same are presented in this communication.

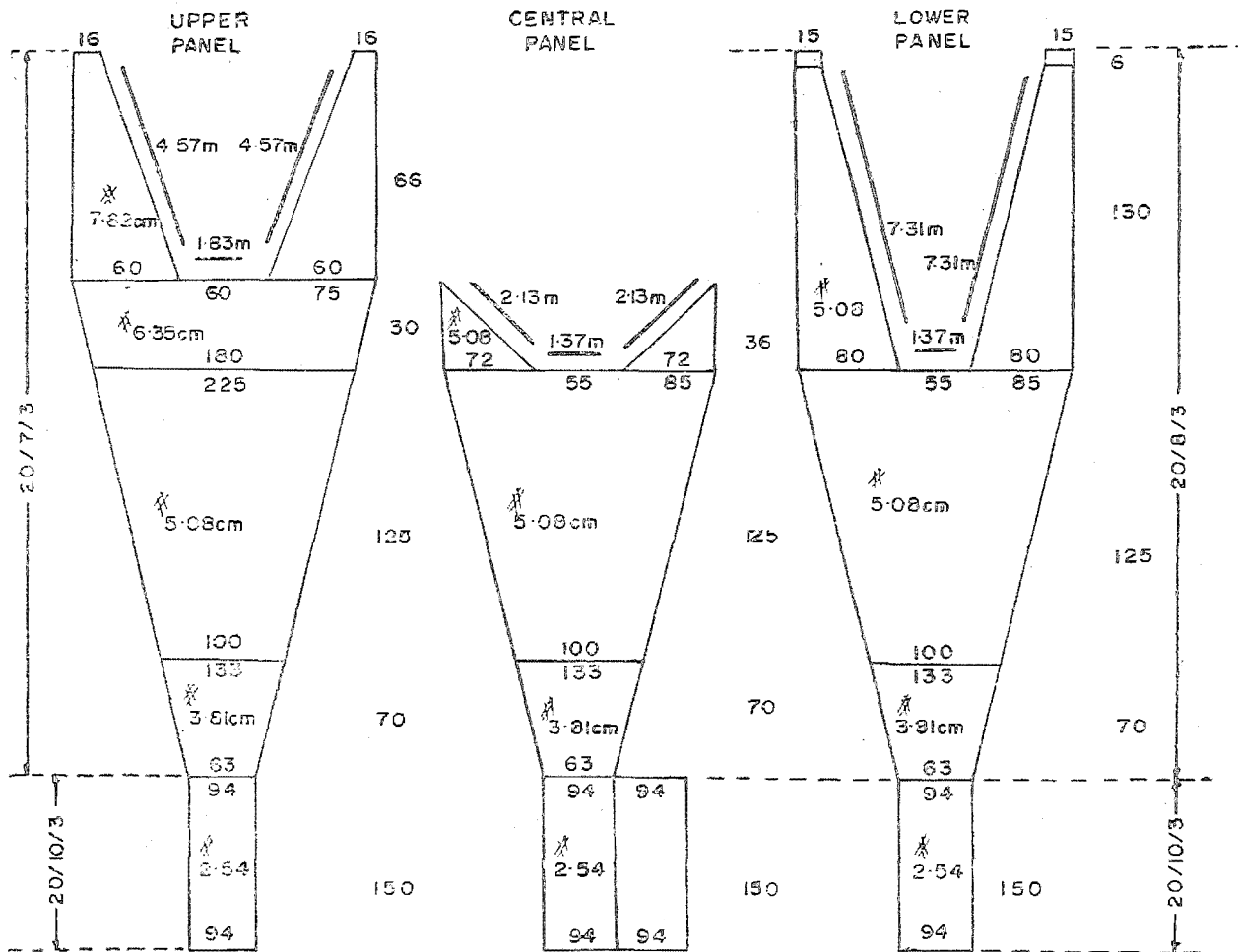
MATERIALS AND METHODS

The design details and the constructional particulars of the trawl net are shown in Fig. 1.

The net essentially consists of a normal two seam type with a middle panel inserted, as shown, to divide the net horizontally and provided with two separate codends. The rope attached to the central webbing with wooden floats was joined with the lateral seaming lines of the net.

*Present address: C. I. F. T. Sub-station, Burla, Orissa

DESIGN OF 10.97m. THREE PANEL DOUBLE TRAWL NET



TECHNICAL DETAILS

- HEAD ROPE 10.97m. Manila of 12mm. dia.
- FOOT ROPE 15.99m Manila of 19mm. dia.
- CENTRAL ROPE 5.63m. Manila of 9mm. dia.
- BOLCH LINE 5 to 10% Longer than the ropes - Manila 6mm. dia.
- FLOATS 127mm dia Aluminium 9 Nos. on HR
Spindle shaped Elovu wood (Bombax Malabaricum)
10 16x4 00x2 50cm 45 grms. Buoyancy
9 Nos. on Central rope
- SINKERS Barrel shaped Lead 225grms each 5 Nos.
and Iron chain of 1 kg 4 Nos.

Fig. 1

TABLE I
Details and results of operations of 10.97 m.
three panel double trawl

	Fishtech No. 1		Fishtech No. 7	
Depth of fishing ground in metres	8 - 14		15 - 40	
Warp length used in metres	50 - 80		80 - 210	
Horizontal distance between otter boards in metres	average:	7.53	22.09	
	range :	(6.17-8.47)	(18.62-26.67)	
Towing tension on warp in kg.	average:	359.0	455.0	
	range :	(320.0-394.0)	(428.0-484.0)	
Towing speed in knots	average:	2.0	2.16	
	range :	(1.50-2.30)	(1.70-2.37)	
No. of hauls/Tow. time in hrs.	25/24.00		20/19.30	
	Upper codend	Lower codend	Upper codend	Lower codend
Total catch in kg.	50.50	273.50	260.25	615.75
Catch per trawling hr. in kg.	2.10	11.40	13.35	31.50
Catch per haul/Tr. hr. in kg. (range)	(0.5-7.0)	(0.5-33.0)	(1.0-78.0)	(2.5-121)

Fishing was attempted in two series at varying depths and from two different boats; 9.13 m. with 36 H. P. engine (Fishtech No. 1) in the depth ranges of 8-14 m. during October, 1969 and from 12.16 m. with 60 H. P. engine (Fishtech No. 7) in the depth ranges of 15-40 m. during May, 1971. Vertical curved otter boards of dimensions 100 x 50 cm. and weighing 35 kg. were used in the case of fishing operations with the former boat, while V-shaped steel otter boards of dimensions 122 x 72 cm. and weighing 55 kg. were used in the case of the latter. The net was directly attached to the otter board by its extension legs of length 7m., when operated from Fishtech No. 1. While operated from Fishtech No. 7,

besides legs, single sweep wire of 20 m. length on either side was provided. Trial fishing was conducted in the known fishing grounds (Sreekrishna & Narayanappa, 1970 and Narayanappa *et al.*, 1972).

RESULTS AND DISCUSSION

The details of the fishing operations conducted from the two boats and the results are given in Table I.

The perusal of the Table indicates that the catch rate is better when the net was operated from Fishtech No. 7 and the lower codend yielded more fish than the upper codend. In the case of operations from Fishtech No. 7; the catch

TABLE II
Catch composition in each of the boats (in percentage)

Name of Fish	Fishtech No. 1		Fishtech No. 7	
	Upper Codend	Lower Codend	Upper Codend	Lower Codend
<i>prawns</i>	44.5	71.5	2.9	8.3
<i>lactarius</i> , Carangids & Pomfrets	—	—	13.2	5.9
Sciaenids	6.9	9.8	16.8	30.0
<i>Trichurius</i> sp.	26.7	2.9	—	—
<i>Upenoides</i> sp. and <i>Cynagris</i> sp.	—	—	47.1	22.9
soles & squids	—	6.8	10.0	16.8
Saurids tumbil	—	—	—	2.5
rays	—	—	—	10.1
miscellaneous	21.9	6.9	10.0	3.5

in the lower codend was approximately 2.5 times more than the upper codend.

Specieswise analysis of the catch in upper and lower codends are presented in Table II.

The catch composition indicates that more of bottom fishes like prawn, sole and sciaenids are found in the lower codend, while the off-bottom fishes like *Lactarius*, *Caranx* and pomfret in the offshore operations from Fishtech No. 7 and ribbon fish in the inshore operations from Fishtech No.1 are more in the upper codend. Dickson (1959) found good changes in the percentage of fish that appeared in the upper codend - the change being in the type of fish, by day and night and from one ground to another. Nakamura (1970) described the utility of

the two floor trawl net, (vertical twin body net) in catching fish such as sole swimming close to the sea bottom with the lower net and such fish as herring swimming off the sea bottom with the upper net. The present study reveals the effectiveness of this net for catching the bottom and off-bottom fish simultaneously and its utility in separating them in the fishing operation itself.

The horizontal spread between the otter boards was found to be 30.12% and 34.14% of the head rope length of the gear, when operated from Fishtech No. 1 in inshore waters and Fishtech No. 7 in deeper depths respectively. This horizontal spread although low, indicated the possibility of a good vertical opening of the gear. This is further supported by the catch of off-bottom fishes in the

upper codend. The underwater resistance of the gear as measured on the towing warps showed reasonable difference between the two boats in view of the difference in the area and depths of operation, difference in the otter boards used and towing speed. In the light of these observations, the net described is very useful for the simultaneous and at the same time, separate capture of bottom as well as off bottom fishes. Further this net can also be advantageously used in testing and exploring the new grounds for the availability of different types of fishes.

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