

PROFITABILITY LEVEL OF TRAWLERS OPERATING FROM COCHIN FISHERIES HARBOUR

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Introduction

Fishing is an age old occupation in Kerala. The state produces about half a million tonne of fish and stands first among the maritime states of India in fish production and prawn export. A new development in fisheries started in late fifties with the introduction of mechanisation. In sixties, another innovation took place in gear by changing cotton thread to nylon in net making. In the same decade introduction of trawlers for fishing in coastal water brought a dynamic change in the fishing industry in terms of infrastructure development, especially the shrimp processing.

During 1980-81 there were about 980 mechanised fishing craft and 76% of these came under the category of small and medium trawlers. About 1,500 trawlnets were owned by fishermen in the state and Ernakulam being one of the important districts for fishing activities owned 16% of the total trawlnets operating in the state.

With the immense increase in the number of trawlers at present a feeling is developing that trawlers in certain areas may run into loss due to over-exploitation of resources. One of the main reasons for this sort of risky economic situation seems to be due

to over-dependence of trawlers on prawn catch. Secondly, the new grounds of fishing have not been explored beyond 50-60 metre depth. Due to this uncertain position and due to heavy involvement of capital in modernisation and mechanisation it has become imperative to study economics of trawl operation which would help in implementing fishery development schemes especially relating to mechanisation in the state. In the recent past the Central Marine Fisheries Research Institute, has conducted various case studies in the field of socio-economics of different craft-gear combination, especially the mechanised one in different regions. The present study is limited to Cochin Fisheries Harbour and an attempt has been made to quantify the profit/loss of the trawlers.

Data Collection

Two questionnaire were prepared for data collection. Schedule I deals with the details of hull, engine and net, ownership of trawlers, type and number of crew, fishing trip duration, distance of fishing ground, mode of disposal catch and agency to whom it is sold, insurance and other miscellaneous items. Schedule II contains information regarding the quantity and

value of different species caught in trawlnet, labour wage, quantity and value of fuel consumed, auctioning charges, expenses on food, bata, ice and salt, market tax, jetty rent etc. Thus, the two schedules cover all items of fixed and operational costs at one hand and the gross revenue received by a unit on the other hand.

The data were collected from January to December 1990 by the trained technical staff of the Institute on randomly selected days in each month by observation as well as by inquiry. Since there was a ban on monsoon fishery for a period of 25 days effective from 28 June 1990, the number of observation days was only 2 in July. In all months atleast 10% of the total number of days fished was observed for data collection from 10 randomly selected trawl units at Cochin Fisheries Harbour. Though 10 observations per month were planned for one year period but due to technical and financial reasons the number of observation days ranged from 2 to 10 per month. Following table gives the details of actual fishing days and the observed days.

Month :	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Actual Fishing Days	22	19	22	21	22	19	5	22	21	22	21	19
Days Observed	9	10	10	3	4	9	2	5	5	5	5	5

Total number of days fished: 235; observation days: 72.

To know the seasonal variation the 12 months period was divided into 4 quarters. The species caught in trawlnet are clubbed into 9 major categories.

Trawl Units and Investment

During 1990, about 300 trawlers were land-

ing their catch at Cochin Fisheries Harbour and most of them have single ownership. Though hull size ranges from 32' to 44' but majority are of 32' trawlers. The average value of a new hull is Rs. 2.0 lakhs. The main brand of engine fitted in the boats is Ashok Leyland and the engine power ranges from 65 to 120 H.P. In general, 4-6 cylinder engines are fitted in trawlers. The average value of the engine fitted in 32' trawler at Rs. 1.35 lakhs (Table 1.)

In each trawl unit 2-3 nets are used mostly for bottom trawling. Each net is about 200 feet in length and the mesh size is 18-200 mm at the cod end. Average value of the trawl nets has been taken at Rs. 25,000 per unit. Besides investment on hull, engine and nets there are other major and minor implements/accessories in a trawler like winch, wire rope, otter board, gallows, pulleys, diesel tank etc. All accessories put together from an investment of about Rs. 30,000 in a unit.

Thus, the total investment in a 32 footer trawler during 1990 was found to be Rs. 3.9 lakhs, of which major share is accounted for hull (51.3%) and engine 34.6%).

Annual fishing cost

The fixed cost components, include depreciation of a trawler, interest on capital investment and annual insurance premium. Table 2 shows that at the rate of 10% depreciation for boat and engine the depreciated amount comes to rs. 33,500. All the

three nets are fully used in a year and thus an amount of Rs. 25,000 i.e. 100% value of the trawl nets has been accounted for depreciation. Accounting 33.3% depreciation rate for accessories the amount depreciated comes to Rs. 10,000 per annum. Thus, total amount towards depreciation has been calculated at Rs. 68,500 in a year for a trawl unit.

Loan for purchase of trawlers has been availed from the Union Bank, UCO Bank and State Bank of Travancore. While calculating interest on capital a mild interest rate of 15% has been accounted on a sum of Rs. 3.9 lakh and the amount thus derived comes to Rs. 58,500. Similarly, 6% insurance premium amounts to Rs. 20,100 in a year for a trawl unit. Thus, the total fixed cost comes to Rs. 1,47,100 and its components like depreciation, interest and insurance accounts for 46.6%, 39.8% and 13.6% respectively.

As given in table 3 variable cost of trawl operation reached to a total of about Rs. 4,64,500 during 1990 at Cochin Fisheries Harbour. The most important component of the operational cost is fuel amounting to Rs. 1,96,415 for 235 trips. The trawlers fish upto 30 nautical miles and operate upto a depth of 60 metres. Most of the trawlers observe single day trip. During the study year the diesel rate was Rs. 4.7 per litre from January to October and Rs. 5.83 litre in November and December. No subsidy on fuel is reported.

Wage of crew is next major expenditure on-board. An amount of about Rs. 1.5 lakh per trawler was spent towards this head during 1990. Crew of 5-6 persons work in a trawl unit and get share in the catch. After deducting expenses on fuel, bata, food and other variable items from the gross revenue, 35% is earmarked for crew wages. Most of the trawlers are following this

production based share system at this centre. The wages accounted for 32.2% of total variable expenditure of a unit.

An amount spent on food and bata for crew was 4.6% of operational expenditure. In a year a sum of Rs. 21,150 was incurred on food and bata. The total annual repair and maintenance costed Rs. 37,600 for a trawl unit which formed 8.1% of the operational expenses. Boat/engine repairing yards (5 nos.) are available within a distance of 1 km from Cochin Fisheries Harbour.

Since most of the trawlers observe single day fishing trip there is not much consumption of ice onboard. An average amount of Rs. 10,575 was spent by a trawl owner on ice in a year. In a trip 3 blocks of ice are consumed and each block costs about Rs. 15.

Marketing commission i.e. auctioning charge is rated at 6% of the gross sale of a trawler's catch. After landing of a trawler it is the duty of commission agent to arrange for unloading and selling the catch. In the study year the auction charges per trawler amounted to Rs. 42,290 which formed 9.1% of the annual operational charges. Jetty rent and expenditure on other small items totalled to Rs. 6,815.

Fish production and revenue

Except on Sundays and religious occasions fishing is observed daily in non-monsoon months. Night fishing is not practiced at this centre. A total of 235 fishing trips were observed during 1990. General amenities and fishery infrastructure are well developed at this centre.

The details of catch and the value realised have been presented in table 4. In first quarter the fishing was observed on 63

days and a catch quantity of 10,701 kg was worked out. The main components of the catch were prawns (23.4%), flat fishes (13.2%), mackerel (12.2%) and cephalopods (13.2%). Among the different species groups prawns generated the highest revenue (54.7%). Cephalopods is the another group contributing significantly (13.2%) towards the gross revenue. The total catch sale during first quarter of the year is worked out at about Rs. 1.5 lakhs.

In the second quarter, the most important group was carangids forming 34.4% of second quarterly catch. The share of prawn in second quarterly catch was 27.1% and that of mackerel 13.5%. Except flat fishes (7.0%) other groups, individually, contributed less than 5%. The total catch was about 18 tonnes a unit fetching a revenue of Rs. 2,73,476. In this quarter also about half of the revenue was realised from the sale of prawns. The carangids fetched 22.5% of the revenue in this quarter.

During the premonsoon quarter of 48 fishing trips, prawn catch was less than one per cent. About 90% of the quarterly catch was formed by threadfin breems, which earned about 80% of the revenue in this quarter. All other fishes, individually, contributed less than 10% in terms of quantity of catch and the value realisation.

In the fourth quarter there was improvement in the prawn catch (12.2%). Other important constituents of catch were flat fishes (15.2%), mackerel (19.3%), pomfret (13.4%) and carangids (15.9%). To the revenue 36.3% was added by prawns, 31.8% by pomfrets and 10.7% by croakers. Other species could add less than 10% each. The total catch of the quarter was about 11 tonnes valued at Rs. 115602.

The analysis of annual catch and revenue shows that in the total catch,

prawn was about 11% which added 38.2% to the revenue. About 10% of catch was composed of miscellaneous fishes and 5% of revenue was received from that. Threadfin bream was one of the major catch components (47.1%) which contributed 19% towards annual revenue at this centre. Another group crossing 10% in terms of quantity and value realisation was that of carangids. The species contributing revenue in the range from 5 to 10 per cent include mackerel, pomfret and cephalopods. The total catch of a trawler during 1990 is calculated at about 81 tonnes fetching a gross revenue of about Rs. 7 lakhs.

The comparison between different quarters shows that share of prawn in quarterly catch was the highest in second quarter (27.1%) and the lowest in third quarter (<1%). There was a very heavy catch of threadfin breems in third quarter. The quantity caught per trawler was about 37 tonnes. The miscellaneous catch ranged from 1367 kg per trawler in third quarter to 3151 kg in first quarter. Overall, third quarter contributed maximum in terms of quantity and second quarter in terms of revenue. Except third quarter the number of fishing trips did not vary in different quarters (62-63 days). Because of ban on monsoon fishing the fishing trips were restricted to 48 in third quarter.

Productivity and economic efficiency of a trawl unit

Various parameters of economic efficiency and productivity of a trawler are presented in table 5. Taking 235 trips of a trawler during the study year the catch per trip averaged 344.3 kg per trawler which fetched a revenue of Rs. 2999.26. Thus, the value realised per kg of catch comes to Rs. 8.71.

Since 6 persons form an average crew on these units the productivity per man is found to be 57.4 kg per trip. The gross revenue per man trip is calculated at Rs. 499.88. As mentioned earlier there is a sharing system of revenue and thus each worker on board got Rs. 106.14 in a trip.

The fuel being the main cost component, an expenditure of Rs. 835.1 per trip is observed per trip. To produce a kg of fish, worth Rs. 8.71, an average amount of Rs. 2.43 is spent on fuel. The operating cost per trip is averaged at Rs. 1976.59 and the average cost per kg of fish production is worked out at Rs. 5.74. Thus, income over operating cost in a trip comes to Rs. 1022.67.

The total cost of a trawl trip being Rs. 2602.55, the cost of producing a kg of fish averages Rs. 7.65, resulting in a net profit of Rs. 1.15 per kg of fish.

The net income generating from fishing operation without taking depreciation into account would equate investment in a trawler in 2.41 years provided the income

generation is matched with that of the study year. The capital turnover ratio i.e. the ratio of gross income to the investment is worked out at 1.81.

The operating cost ratio and the fixed cost ratio are 0.66 and 0.21 respectively whereas the total cost ratio, which shows the ratio of total fishing cost to gross revenue is found to be 0.87. The rate of return to capital is 39% against the rate of interest of 15% accounted for in this study.

Economic status of trawl fishing

The annual profit of a unit owner is about Rs. 93 thousand. If labour of the owner is treated at par with that of a wage earner on board his labour is worth about Rs. 25 thousand and thus the return to the management comes about Rs. 68 thousand in a fishing season.

The labour productivity, fuel productivity, pay back period, capital turnover ratio, cost ratios and rate of returns to capital show that trawl fishing at Cochin Fisheries Harbour was clearly profitable during 1990.

Table 1. Investment in a trawl unit at Cochin Fisheries Harbour, 1990

I. Investment on a trawler		
	Rupees	% of investment
a. Hull	2 lakhs	51.3
b. Engine	1.35 lakhs	34.6
c. Nets	0.25 lakh	6.4
d. Accessories	0.30 lakh	7.7
Total	3.9 lakhs	100

Table 2. Items of fixed cost

Fixed cost Items	Amount (Rs)	% of fixed cost
I. Depreciation		
a. Boat & engine (10%)	33,500	22.8
b. Nets (100%)	25,000	17.0
c. Accessories (33.33%)	10,000	6.8
II. Interest on capital (15%)	58,500	39.8
III. Insurance premium	20,100	13.6
Total Rs.	1,47,100	100

Table 3. Operational cost of trawl fishing at Cochin Fisheries Harbour, 1990

Items	Expenditure (Rs)	
	Annual	% of operational cost
1. Fuel	1,96,415	42.2
2. Wages	1,49,654	32.2
3. Food & bata	21,150	4.6
4. Repairs & maintenance	37,600	8.1
5. Ice	10,575	2.3
6. Auction of fish	42,290	9.1
7. Jetty rent & other items	6,815	1.5
Total operational cost (VC)	=	4,64,499
Income over operational cost	=	2,40,328
Total annual cost (FC + VC)	=	6,11,599
Net profit	=	93,228

Table 4. Details of catch and value realised in a trawl unit at Cochin Fisheries Harbour during 1990

Group		I Qr.	II Qr.	III Qr.	IV Qr.	Annual (%)
P. Prawns	Q	2506 (23.4)	4856 (27.1)	126 (0.3)	1337 (12.2)	8825 (10.9)
	V	83414 (54.7)	138946 (50.8)	4998 (3.1)	41962 (36.3)	269320 (38.2)
Croakers	Q	529 (5.0)	427 (2.4)	63 (0.2)	263 (2.4)	1282 (1.6)
	V	2163 (1.4)	2180 (0.8)	441 (0.3)	787 (0.7)	5571 (0.8)
Flat fishes	Q	1411 (13.2)	1249 (7.0)	132 (0.3)	571 (5.2)	3363 (4.2)
	V	6699 (4.4)	17498 (6.4)	682 (0.4)	1732 (1.5)	26611 (3.8)
Mackerel	Q	1309 (12.2)	2413 (13.5)	-	2122 (19.3)	5844 (7.2)
	V	11296 (7.4)	24651 (9.0)	-	8786 (7.6)	44733 (6.3)
Pomfret	Q	378 (3.6)	168 (0.9)	-	1474 (13.4)	2020 (2.5)
	V	8655 (5.7)	4063 (1.5)	-	36817 (31.8)	49535 (7.0)
Cephalopods	Q	1417 (13.2)	790 (4.4)	809 (2.0)	610 (5.6)	3626 (4.5)
	V	24704 (16.2)	16884 (6.2)	11567 (7.1)	8704 (7.5)	61859 (8.8)
Carangids	Q	-	6155 (34.4)	1589 (3.8)	1754 (15.9)	9498 (11.7)
	V	-	61526 (22.5)	8855 (5.4)	8688 (7.5)	79069 (11.2)
Threadfin breams	Q	-	-	37218 (90.1)	866 (7.9)	38084 (47.1)
	V	-	-	131225 (80.3)	2620 (2.3)	133845 (19.0)
Miscella- neous	Q	3151 (29.4)	1854 (10.3)	1367 (3.3)	1990 (18.1)	8362 (10.3)
	V	15498 (10.2)	7728 (2.8)	5552 (3.4)	5506 (4.8)	34284 (4.9)
Total	Q	10701 (100)	17912 (100)	41304 (100)	10987 (100)	80904 (100)
	V	152429 (100)	273476 (100)	163320 (100)	115602 (100)	704827 (100)
Per trip catch		170	289	860	177	344
Revenue		2420	4411	3402	1864	2999
No. of fishing days		63	62	48 *	62	235

* Ban on trawl fishing was observed from 28th June to 22nd July 1990.

I Qr. = Jan. - March

II Qr. = April-June

III Qr. = July-Sept.

IV Qr. = Oct. - Dec.