



समुद्री मात्स्यकी सूचना सेवा

MARINE FISHERIES INFORMATION SERVICE

No. 114

OCTOBER, NOVEMBER, DECEMBER 1991



तकनीकी एवं विस्तार अंकावली TECHNICAL AND EXTENSION SERIES

केन्द्रीय समुद्री मात्स्यकी अनुसंधान संस्थान
कोचिन, भारत CENTRAL MARINE FISHERIES
RESEARCH INSTITUTE
COCHIN, INDIA

भारतीय कृषि अनुसंधान परिषद
INDIAN COUNCIL OF AGRICULTURAL RESEARCH

ECONOMIC FEASIBILITY OF TRAWLING IN MAHARASHTRA

D.B.S. Sehara, J.P. Karbhari and K.P. Salini

Central Marine Fisheries Research Institute, Cochin - 682 031

Introduction

The annual marine fish landing in the 5 maritime districts of Maharashtra varies from 3 to 4 lakh tonnes. Of the total catch, about 90% comes from mechanised sector. Bagnet, trawl net and gillnet are important among the fishing nets. About 40% of total mechanised catch is contributed by trawlers in the state. Important species of trawl include prawns, croakers, ribbon fish and elasmobranchs. In Maharashtra the major concentration of trawlers is found in Greater-Bombay, Raigad and Ratnagiri districts.

The use of mechanised boats in place of traditional boats for fishing operation is on the increase in the state. It is generally reported that catch per trawl unit is decreasing and simultaneously, the acquisition cost of a trawler is increasing. Unit price of fish caught in a trawler also plays an important role to mark the level of profitability. Thus, catch availability and its price at one hand and operating and fixed cost of trawl operation on the other hand are the vital items to be studied to know the economic viability of

trawling. Further, it is not only the quantity of the catch but also its quality which determines the net earnings of a unit. Besides this, internal and external marketing forces also influence the price of the catch. Thus, with the main objective of finding out profitability level of trawl units in Maharashtra, the Central Marine Fisheries Research Institute, Cochin has conducted a study at selected trawl operating centres in the state during 1987-'88.

Data base

Preliminary information about trawl landing centres were collected from two districts of Maharashtra namely Greater Bombay and Ratnagiri. Considering infrastructure development and number of trawlers in operation, New Ferry Wharf landing centre in Greater Bombay and Mirkerwad in Ratnagiri were selected for the study of economics of trawlers. To collect data from trawlers two enumerators from fishermen group available at the centres were engaged and trained in data collection. The basic data including details of boat, engine, area of operation, number of days in a trip, ownership of trawlers, labour engagement, marketing mechanism etc. were collected from port authorities, fishermen cooperative societies and the catch collectors at the centre. For collecting information on catch, price and cost of fishing a questionnaire was framed and pretested. The trained enumerators collected catch details from 30 trawlers in a month selected at random on 10 days systematically selected for a period of 9 months of active fishing during 1987-'88. In this article the period from September to November is referred to as post-monsoon quarter (I quarter), December to February as winter (II quarter) and March to May as pre-monsoon quarter (III quarter).

For the convenience of data tabulation, the catch was grouped into 12 categories namely prawns, lobsters, cephalopods, elasmobranchs, croakers, ribbon fish, eels, catfish, perches, lizardfish, pomfret and clupeoids, and valued accordingly. All other fishes were clubbed under miscellaneous category. The sum total of value of all the groups forms the revenue. The value of catch calculated for this purpose is based on landing centre price.

Infrastructure development

New Ferry Wharf landing centre is privi-

leged with sufficient fishery infrastructure facilities. Main town, bus stand, market and railway station are within a distance of 3 km. The centre has water and electric connections. Hand cart, tempo and tucks are used for fish transportation. The boat and engine service station and jetty facility are available within easy reach. Ice plants and cold storages are located in New Bombay and Vasi areas. The ice is supplied by private parties at the centre itself. Maharashtra Rajya Machimar Sangh and 3 private dealers supply diesel to the trawlers. Quality fish like prawns, lobsters, and cephalopods are auctioned and sold to the dealers who supply the catch to processing units and charge commission @ 3-4% of the value of catch. Sometimes these suppliers or fish merchants take money from the exporters/processors and pay to the fishermen as an advance with no charge of interest who in turn sell their catch to these suppliers at a little lower than the prevailing rate. Other catch is sold to the retailers through auction. In case of bumper landings, the catch is sold to the wholesalers and the payment is made later based on prevailing market price on that day.

Mirkerwada which is about 2 km from the main town has got water and electric connections. Market, bus stand, ice factories, jetty and cold storage facilities are available. Auto, trucks and hand cart are common means of transportation. Boat and engine are serviced at the centre itself.

A fishermen cooperative society is also functioning at the centre but its activities are limited. The fishermen have organised a society which deals with the marketing of comparatively cheaper fishes like dhoma, ribbonfish, shark etc. The commercially important catch is purchased by a few Processing companies located in Ratnagiri itself. These companies create a situation of monopoly in dealing with the marketing of quality catch like prawns. Fishermen get advance from the traders and the price paid for their catch is not a competitive one. As reported by fishermen, the entrance of new companies in marketing of exportable species is very difficult if not impossible at this centre.

Trawl operation

About 800 trawlers of 11-14m land at New Ferry Wharf centre and as many as 90% of them are owned by the fishermen from Gujarat. The majority of the crafts are fitted with 4-6 cylinder

TABLE 1. Investment in a trawl unit 1987-88

Item	Value (Rs)	
	New Ferry Wharf	Mirkarwada
a. Hull	245,500	270,000
b. Engine	165,000	175,000
c. Nets	18,600	15,000
d. Accessories	31,500	33,500
e. Miscellaneous items	9,780	8,750
Total investment	470,380	521,250

Ashok Leyland inboard engines. Except a few, most of the trawlers have single ownership system. The number of trawl nets in a unit varies from 4 to 7.

The fishing generally starts in September and terminates in May. Fishing operation takes place upto 40 fathoms of waters during post-monsoon quarter, upto 50 fathom in winter and upto 60 fathoms during pre-monsoon quarters. In monsoon a limited number of trawlers operate on selected days. During first quarter, fishing is carried out from Versova to Ratnagiri, during second quarter in Bombay High and during third quarter beyond Bombay High, Madhvad and Jafrabad areas. A fishing trip comprises 4-5 days.

At Mirkarwads centre, about 150 trawlers land their catch. Most of the trawlers are 12-15m in length fitted with 4-6 cylinder inboard engines. Popular engines include Ashok Leyland, Ruston and Bukh. The number of trawl nets in a unit varies from 3 to 6. In the starting of the season the fishing is carried out upto 20 fathoms of water whereas in winter and pre-monsoon it reaches upto 60 fathoms. September to May period is usually treated as active fishing season. In first quarter, a fishing trip is observed from morning to evening while in second and third quarters it involves 2-4 days. The fishing is extended upto Janjira Murud and Vengurla regions.

Costs involved in trawl fishing

a) Sunk cost

The fixed cost associated with trawl fishery is mainly dependent on the initial capital investment in the means of production, the interest paid on the capital and the insurance.

TABLE 2. Fixed cost

Item	Cost (Rs)	
	New Ferry Wharf	Mirkarwada Wharf
I. Depreciation		
a. Trawler (Hull & engine)	41,050	44,500
b. Nets	9,300	7,500
c. Accessories	6,300	6,700
d. Misc. items	9,780	8,750
Sub total	66,430	67,450
II. Interest on initial investment	70,557	78,188
III. Insurance	13,547	14,685
Total fixed cost	1,50,534	1,60,323

At New Ferry Wharf, the average capital investment in a trawler was worked out at Rs. 4.7 lakhs including the cost of hull (Rs.2.46 lakhs), engine (Rs. 1.65 lakhs), nets 18.6 thousand and other equipments, (Rs. 41.3 thousand). The accessories include winch, wire rope, otter boards, gallows, pulleys etc. Most of the trawlers were purchased in seventies and also in early eighties and there has been rise in the cost price of a trawler in subsequent years. To avoid the problem of appreciation, cost price of a new trawler in the study year has been taken for the calculation of fixed cost.

Taking 10% wear and tear per annum the depreciation on hull and engine is worked out at Rs. 41,050. The life of net has been treated as 2 years and thus the fixed cost for nets is Rs. 9,300 per year. The accessories are depreciated @ 20% and an amount of Rs. 6,300 is taken towards the fixed cost. The miscellaneous items

TABLE 3. Operating expenses of trawl fishing

Item	Annual expense (Rs)	
	N. F. Wharf	Mirkarwada
1. Fuel	134,190	122,500
2. Repair & maintenance	36,675	28,700
3. Ice	38,250	22,000
4. Crew wages	64,800	55,600
5. Food and bata	48,150	30,400
6. Market commission, wharfage and other misc. expenses	19,800	17,000
Total	341,865	276,200
Total annual operating cost (F. C+V.C)	Rs. 492,399	Rs. 436,523

worth Rs. 9,780 have been treated to be fully consumed in a year and thus 100% replacement is required every year for such items. Thus, the total amount of depreciation is calculated at Rs. 66,430 for a trawler.

The annual interest (@ 15% p.a.) on the capital amounted to Rs. 70,557. For an average size of trawler the insurance premium, worked out to be Rs. 13,547 @ 3.3% on the value of hull and engine. Depreciation, interest and insurance totalled to Rs. 1,50,534.

At Mirkarwada landing centre the cost of hull, engine, nets, accessories and minor items is taken at Rs. 2.7 lakhs, Rs. 1.8 lakhs, Rs. 15 thousand, Rs. 33.5 thousand and Rs. 8.8 thousand respectively. The total initial investment in a trawler at this centre is calculated at Rs. 5,21,250.

Taking depreciated rates similar to that of New Ferry Wharf for different items, the amount of annual depreciation is worked out at Rs. 67,450 for a trawler at Mirkarwada. The annual interest on capital investment and insurance premium are calculated at Rs. 78,188 and Rs. 14,685 respectively. Thus, the total annual fixed cost amounts to Rs. 1,60,323 for a trawler.

b) *Operating expenditure*

For trawl operation the major operating expenses include the cost of fuel, labour, food & bata, ice and repair & maintenance. The cost of diesel and oil for operation of a trawler at New Ferry Wharf comes to Rs. 134,190 for a full fishing season of about 9 months. The next major cost-item is labour charges i.e. crew wages. Eight to nine persons form the crew in a trawler. Most of the crew work on contract basis. Each person gets Rs. 700 - 1,000 per month depending on his age, experience in fishing and type of work he attends. The crew wages average to Rs. 64,800 in a unit for the full fishing season. Since the trawlers are observing long trips, there is substantial expenditure on ice in each trawler. The cost of ice for a trawler amounts to Rs. 38,250 at New Ferry Wharf. Another important cost item is food & bata to be provided to crew. An amount of Rs. 48,150 is accounted for food and bata in a trawl unit.

There are two types of repairs. Some repair and maintenance works are attended to day-to-day or on accident while others are mainly

undertaken in monsoon. Painting of boat, servicing of engine and replacement of spare parts are attended to in rainy season. The cost of these two types of repairs is found to be Rs. 36,675. The rest of the charges such as water charges, wharfage, commission etc. are clubbed under miscellaneous category and amount to Rs. 19,800 at this centre. The total operating expenses for a trawl unit amount to Rs. 341,865 at New Ferry Wharf.

The operating cost-items for Mirkarwada centre are also categorised in the similar way. The most important among these items is fuel costing Rs. 122,500 in a year. One fishing trip is observed for 2-4 days and thus, ice consumption is comparatively less at this centre. Ice worth of Rs. 22,000 was consumed in a trawler in the study year. The crew comprises 7-9 persons and the average wage in a trawl unit comes to Rs. 55,600. Some labourers work on contract basis, some on monthly payment and others on per trip payment. The food & bata expenses are comparatively less at this centre. An amount of Rs. 30,400 incurred towards food & bata in a trawl unit during 1987-'88.

The regular and seasonal repairs and maintenance cost Rs. 28,700 for a trawl owner at Mirkarwada. Other expenses including that of marketing, minor items and payments amount to Rs. 17,000. Thus, total operating cost of a trawler averages Rs. 2,76,200.

c) *Catch and revenue*

Trawlers are mainly concentrating on prawn catch and accordingly, mesh size of the net is designed by the fishermen. At New Ferry Wharf, 15% of annual catch and about 1/4th of first-quarter catch are formed by prawns. Other important species of annual catch include elasmobranchs (12%), croakers (12%), ribbonfish (10%) and catfish (11%). The miscellaneous species put together form 17% of the annual catch. Rest of the species, individually, contributed not more than 5% to the catch. The total catch of a trawler comes to 56,800 kg for the fishing season. About 37% of annual catch is landed in September - November period.

About 51% of the annual revenue of a trawl unit at New Ferry Wharf accrued from the sale proceeds of prawns alone. Other important groups include lobsters (11%), cephalopods (4%), croakers (10%), ribbonfish (4%) and elas-

TABLE 4 (A). *Catch and revenue of a trawler at N. F. Wharf, 1987-'88*

Species group	I Qr	II Qr	III Qr	Annual
Prawn	C 5,090 (24)	1,812 (10)	1,747 (10)	8,649 (15)
	V 134,730 (60)	68,242 (43)	66,590 (47)	269,562 (51)
Lobster	C 424 (2)	181 (1)	175 (1)	780 (1)
	V 29,192 (13)	16,926 (11)	12,751 (9)	58,869 (11)
Cephalopods	C 848 (4)	1,268 (7)	874 (5)	2,990 (5)
	V 4,491 (2)	11,041 (7)	7,084 (5)	22,616 (4)
Elasmobranchs	C 1,909 (9)	2,356 (13)	2,795 (16)	7,060 (12)
	V 4,491 (2)	6,309 (4)	8,501 (6)	19,301 (4)
Croakers	C 2,333 (11)	2,537 (14)	1,747 (10)	6,617 (12)
	V 17,964 (8)	22,081 (14)	14,168 (10)	54,213 (10)
Ribbonfish	C 1,485 (7)	1,993 (11)	2,271 (13)	5,749 (10)
	V 4,491 (2)	6,309 (4)	7,084 (5)	17,884 (4)
Eels	C 636 (3)	544 (3)	349 (2)	1,529 (3)
	V 2,246 (1)	3,154 (2)	1,417 (1)	6,817 (1)
Catfish	C 1,910 (9)	1,993 (11)	2,096 (12)	5,999 (11)
	V 4,491 (2)	4,732 (3)	4,250 (3)	13,473 (3)
Lisard fish/Bombay duck	C 848 (4)	906 (5)	1,048 (6)	2,802 (5)
	V 4,491 (2)	4,732 (3)	5,667 (4)	14,890 (3)
Perches	C 848 (4)	544 (3)	524 (3)	1,916 (3)
	V 2,246 (1)	1,577 (1)	2,834 (2)	6,657 (1)
Pomfret	C 424 (2)	181 (1)	349 (2)	954 (2)
	V 6,736 (3)	3,154 (2)	4,250 (3)	14,140 (3)
Clupeoids	C 848 (4)	544 (3)	699 (4)	2,091 (4)
	V 4,491 (2)	3,154 (2)	2,834 (2)	10,479 (2)
Misc. Catch	C 3,607 (17)	3,261 (18)	2,796 (16)	9,664 (17)
	V 4,490 (2)	6,309 (4)	4,250 (3)	15,049 (3)
Catch (kg)	21,210	18,120	17,470	56,800
Value (Rs)	22,4550	157,720	141,680	523,950

Note :- Figures in parentheses show the percentage contribution of different groups to catch and revenue.

C = Catch (kg), V = Value (Rs).

mobranchs (4%). The rest of the groups individually, added 1 to 3 per cent to the revenue. The annual revenue of a trawler is worked out at Rs. 5,23,950 and 43% of this was earned in first quarter of the fishing season i.e. September - November period. The second and third quarters contributed an amount of Rs. 1.58 lakhs and Rs. 1.42 lakhs respectively.

The annual average catch of a trawler at Mirkarwada during 1987-'88 was calculated at about 55.3 tonnes. About 16% of total landings was represented by different sizes of prawns. In first three months of the fishing season, prawns formed 26% of the catch. Later, the prawn availability reduced to 10-11% of quarterly catch. An analysis of annual catch revealed that besides prawns, other important groups were croakers (13%), ribbonfishes (15%), eels (6%), catfishes (9%), clupeoids (8%) and perches (4%). Miscellaneous catch formed 20%. Of annual catch 38% landed in first quarter almost equally half of the rest in second and third quarters.

The revenue of a trawl unit at Mirkarwada was worked out at about Rs. 4.56 lakhs during the study period. Of the annual revenue 66% was contributed by prawns and 9% by the corakers. Other groups, individually, added 1 to 4 per cent to the revenue. The first, second and third quarter earned an amount of about Rs.2.2 lakhs, Rs. 1.17 lakhs and Rs. 1.18 lakhs respectively. About 3/4 of the revenue in first quarter was obtained from the sale proceeds of prawns whereas in second and third quarter, prawn value accounted for 54 and 56% respectively.

Level of profit and other efficiency parameters of trawl fishing

On an average, a trawler fished on 208 days in the fishing season at New Ferry Wharf and 217 at Mirkarwada centre with per day catch of 273 kg (Rs. 2,519) and 255 kg (Rs. 2,100) respectively. At these centres annual fuel cost was Rs.1.22 to 1.34 lakhs. The average cost of fuel per kg of fish production comes to Rs. 2.3. The fish production per man-day was calculated at 30-32 kg and the crew expense per kg of fish production was Rs. 1.56 -1.99.

The variable expenditure on trawl fishing during the year ranged from Rs. 2.76 lakhs at Mirkarwada to Rs. 3.42 Lakhs at New Ferry Wharf ie. an amount of Rs. 5-6 was spent to catch a kg of fish. Over-head charges formed Rs. 2.65-

2.90 per kg of fish produced. The annual expenses including fixed and variable cost of a trawler aggregated to Rs. 4.9 lakhs at New Ferry Wharf and Rs. 4.4 lakhs at Mirkarwada, averaging to Rs. 8.67 and Rs. 7.90 per kg of fish production respectively.

The income over variable expenses comes about Rs. 1.8 lakhs. The net profit of a trawl unit is calculated at Rs. 31,551 at New Ferry Wharf and Rs. 19,096 at Mirkarwada. Taking Rs. 12,000 as the input value of owner's labour in a year, the return to management comes to Rs. 19,551 at New Ferry Wharf and Rs. 7,096 at Mirkarwada. In 5-6 year period a trawl owner can recover his initial investment. The rate of return to capital is better at New Ferry Wharf (22%) than at Mirkarwada (19%).

The difference between the two centres is recorded in respect of catch availability and total annual operating cost. The lesser net profit at Mirkarwada is due to the comparative low price realised per kg of fish at this centre. As compared to New Ferry Wharf there is about one rupee difference in overall price of one kg of fish at Mirkarwada.

Conclusion and remarks

The investment in a medium size trawler, during 1987-'88, was about Rs. 5 lakhs in Maharashtra. Most of the crafts used for trawling are fitted with 4-6 cylinder inboard engine. The fishing generally starts in September and fag-ends in May. Hardly 5% of trawlers fish in monsoon. Fishing operations are carried out in 20 to 60 fathoms of water. In the first quarter fishing is observed in comparatively shallow water and for a shorter duration of period.

Prawns, lobsters, cephalopods, elsmobranchs, croakers, ribbonfish, eels, catfish, lizard fishes, pomfret and clupeoids are important components of the trawl catch in Maharashtra. Prawns which formed 15-16 per cent of catch fetched 51-66 per cent of the annual revenue. Other species contributing 3% or more towards the annual income include cephalopods, croakers, ribbonfish, catfish and clupeoids at Mirkarwada and lobsters, cephalopods, elasmobranchs, croakers, ribbonfish, catfish, lizardfish/Bombay duck and pomfrets at New Ferry Wharf. An amount of about Rs. 5 lakhs was earned by a trawler during the study year. Of total revenue 43-48 per cent was obtained in first quarter.

TABLE 4 (B). *Catch and revenue of a trawler at Mirkarwada (1987-'88)*

Species group	I Qr	II Qr	III Qr	Annual
Prawn	C 5,464 (26)	1,720 (10)	1,877 (11)	9,061 (16)
	V 171,794 (78)	63,260 (54)	66,083 (56)	301,137 (66)
Lobster	C 42 (0.2)	69 (0.4)	17 (0.1)	128 (0.2)
	V 2,203 (1)	2,347 (2)	1,180 (1)	5,730 (1)
Cephalopods	C 841 (4)	344 (2)	341 (2)	1,526 (3)
	V 6,607 (3)	4,695 (4)	4,720 (4)	16,022 (3)
Elasmobranchs	C 630 (3)	516 (3)	683 (4)	1,829 (3)
	V 1,321 (0.6)	587 (0.5)	1,180 (1)	3,088 (1)
Croakers	C 1,891 (9)	2,925 (17)	2,560 (15)	7,376 (13)
	V 8,810 (4)	16,431 (14)	14,161 (12)	39,402 (9)
Ribbonfish	C 2,942 (14)	2,065 (12)	3,072 (18)	8,079 (15)
	V 6,607 (3)	5,868 (5)	8,260 (7)	20,735 (4)
Eels	C 1,051 (5)	1,032 (6)	1,194 (7)	3,277 (6)
	V 2,202 (1)	2,347 (2)	2,360 (2)	6,909 (2)
Catfish	C 1,471 (7)	1,892 (11)	1,365 (8)	4,728 (9)
	V 4,405 (2)	7,042 (6)	4,720 (4)	16,167 (3)
Lizard fish/ Bombay duck	C 420 (2)	344 (2)	512 (3)	1,276 (2)
	V 881 (0.4)	704 (0.6)	1,180 (1)	2,765 (0.6)
Perches	C 630 (3)	1,032 (6)	682 (4)	2,344 (4)
	V 2,203 (1)	4,695 (4)	3,540 (3)	10,438 (2)
Pomfret	C 210 (1)	52 (0.3)	119 (0.7)	381 (0.7)
	V 4,405 (2)	1,174 (1)	2,360 (2)	7,939 (2)
Clupeoids	C 1,471 (7)	1,548 (9)	1,365 (8)	4,384 (8)
	V 4,405 (2)	4,696 (4)	4,720 (4)	13,821 (3)
Misc. Catch	C 3,952 (19)	3,666 (21)	3,277 (19)	10,895 (20)
	V 4,405 (2)	3,520 (3)	3,541 (3)	11,466 (3)
Catch (kg)	21,015	17,205	17,064	55,284
Value (Rs)	220,248	117,366	1,18,005	455,619

Note :- Figures in parentheses show the percentage contribution of different groups to catch and revenue.

C = Catch (kg), V = Value (Rs.).

There is no significant difference between the revenue accrued in second and third quarter.

The fixed cost comprising depreciation, interest on initial capital investment and insurance is calculated at Rs. 1.5-1.6 lakhs and the variable expenses at s. 2.8-3.4 lakhs. The most important among the variable cost items is the 'fuel' which accounts for 39-44% of the annual variable cost. Labour wages, food and bata together form the second major item (31-33%). An amount of about Rs. 29-37 thousand is spent on annual repairs and maintenance of hull, engine, nets, and other equipments in a trawl unit and a considerable portion of it is spent during monsoon when trawlers are not going for fishing. Though ice is commonly used for preservation of fish, especially commercially important species, its consumption further increases in case of long trips of fishing, called voyae fishing in northwest coast. The expenditure on ice ranged from Rs. 22 thousand to Rs. 38 thousand per annum. Market expenses, water charges, wharfage and other minor items amounted to Rs. 17-20 thousand which forms about 6% of the annual variable expenditure.

While calculating profit margin it is observed that price realised per unit of fish catch makes much difference in annual profit. About Rs. 50 thousand worth difference was realised in revenue received per trawl unit between the two centre due to one rupee difference per kg of fish. The number of fishing days was 208-217. The fuel cost per kg of fish production averaged at Rs. 2.3 and the productivity per man day 31 kg. Average cost of production of 1 kg of fish is worked out at Rs. 8.3 and 1 kg of fish valued at Rs. 8.73. The annual profit of a trawler aranged from Rs. 19 thousand at Mirkarwada to Rs. 32 thousand at New Ferry Wharf. In a period of 5-6 years the owner of a trawler can recover his initial capital investment. The rate of return on capital ranged from 19-22 per cent which is higher than the accounted rate of interest on capital (15%).

Thus, though the catch per trawl unit has been reported decreasing year after year due to increasing trend in number of trawlers in Maharashtra, the units are still running in profit. The rate of return may touch the prevailing institutional interest rate in the coming years if more units enter into fishing. At some centres a few trawlers have been shifting to purse seiners or gillnetters due to uneconomical operation of

Table 5. Profitability and other economic parameters of trawl fishing in Maharashtra (1987-'88)

Items	New Ferry Wharf	Mirkarwada
Annual catch (kg)	56,800	55,284
Annual revenue (Rs.)	523,950	455,619
Value of 1 kg of fish (Rs.)	9.22	8.24
No. of fishing days	208	217
Per day catch (kg)	273	255
Per day revenue (Rs.)	2,519	2,100
Annual fuel cost (Rs.)	134,190	122,500
Fuel cost per kg of fish (Rs.)	2.36	2.22
No. of man days	1,872	1,736
Production per man day (kg)	30.3	31.8
Crew wage, food & bata (Rs.)	112,950	86,000
Crew expenses per kg of fish	1.99	1.56
Total variable expenses (Rs.)	341,865	276,200
Variable expenses per kg of fish (Rs.)	6	5
Fixed cost (Rs.)	150,534	160,323
Fixed cost per kg of fish (Rs.)	2.65	2.90
total annual operating cost (Rs.)	492,399	436,523
Cost per kg of fish (Rs.)	8.67	7.90
Income over variable expenses (Rs.)	1.82 lakhs	1.79
Annual profit (Rs.)	31,551	19,096
Imputed labour of owner (Rs.)	12,000	12,000
Returns to management (Rs.)	19,551	7,096
Pay back period (years)	4.8	6
Rate of return on capital (%)	22	19

trawl net. The dependence of trawlers on prawns and other commercially important species still prevails. Second, though there is growing phase of infrastructure and market facilities in the state, the majority of fishermen still depends on private money lenders/traders for availing loan. Specially, the working capital is managed from private parties and thus, the fishermen have a binding of selling their catch to the private agencies. This results in lower-price-realisation of catch and ultimately in less profit margin to the trawl units. At some centres fishermen cooperative societies are coming forward to help the fishermen in financing and marketing the catch also.

At both the centres under study, it is reported that quota of diesel provided at concessional rate for the trawl units in a year is not sufficient and the fishermen have to pay market rate to fulfill their requirement. Seeing the increasing tempo of mechanisation and realising the importance of fuel in total operating cost, the government should increase the quota of diesel provided at subsidised rate to the fishermen since the trawl fishery is substantially contributing towards fish export.