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Cost and Earnings of Out Board Engine (OBM) Gill Netters along the Veraval harbour, Gujarat

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ABSTRACT
The study was envisaged to know the cost and earnings of gillnetters operating from Veraval harbour (Dist. Junagadh), Gujarat and the economic viability of gillnet fishing. The study was carried out from February 2012 – April 2013. The maximum revenue was fetched by Silver pomfret, with (11.71%) share of the total revenue generated during the study period. Regarding month wise, October was the most productive month in terms of revenue generation (19.34%) for Out Board Engine (OBM) gillnetters. Among seasons, post monsoon season was more productive with (44.03%) contribution of the total fish catch. Capital investment of a single Out Board Engine (OBM) gillnetter was Rs. 4,33,137. Similar was the case with variable cost. It was Rs. 2,48,641.00. Fixed cost inclusive of depreciation was Rs. 66,273.25. Total expenditure and revenue of OBM gillnetter was Rs. 3,14,914.25 and Rs. 3,70,392.00 respectively. The annual profit of rupees 55,477.75 was incurred considering the initial investment in terms of capital cost at the end of first year, however from the second year onwards the OBM gillnetters were more profitable.
Key words: *Veraval harbour , Gillnetting, Fish Catch, OBM.*

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INTRODUCTION

Gillnet is a highly selective fishing gear and is one of the most suitable fish catching method from conservation and stock regulation point of view[15]. Gujarat is a frontline maritime state of India located in the extreme west of the country (20.1o to 24.7o North and 68.4o to 74.4o East). Gujarat with about 20% (1600km) of the country's coastline, 33% of the continental shelf area (1, 64,000 km2) and over 2, 00,000 km2 of EEZ ranks first among the maritime states in marine capture fish production. Gujarat with about 20% of the country's coastline (1600 kms.), 33% of the continental shelf area (1, 64,000 km2) and over 2, 00,000 km2 of EEZ (Exclusive economic zone) ranks first among the maritime states in marine capture fish production with 7.17 lakh tones [2].

Out Board gillnetters play an important role as it contributes about 15.83% overall fish production in Gujarat. There has been continuous increase in the number of mechanized boats in the fishing fleet of state since last decade. Presently, more than 31,370 boats are active in fishing operation, out of which more than 20,359 are mechanized boats and 2,316 are gillnetters operating in coastal waters of Gujarat [1].

Veraval fishing harbour is located between Lat- 20°54' N and Lon- 79°22'E, which is 2 km far from the main Veraval city. There are 932 FRP (Fibre Reinforced Plastic) canoes in the Veraval fishing harbour. Most of the population of this village depends upon fishing activities as the main source of occupation [1]. The fishermen of Veraval fishing harbour operate only gillnet throughout the year. The objective of the present study was to estimate cost and earnings of gillnetters operating off Veraval, fishing harbour.

MATERIALS AND METHODS

The present work was undertaken to study the cost and earnings of the gillnetters operating gillnet along the Veraval fishing harbour. The study was carried out for a period of one year from February 2012 – April 2013. Total 30 OBM gillnetters were randomly sampled. The periodical random sampling method

was adopted for sampling of gillnetters as per [3]. Economic analysis was done by calculating capital cost, total variable cost, total project cost, total fixed cost, total cost, total revenue, and finally annual profit was calculated as per the [3].

Total revenue will be calculated after personal inquiring of prices of fish per kilogram at the landing centre and multiplying it with the quantity of catch landed by a gillnetter. The data obtained for all the weeks in the month was pooled and presented as monthly samples. The data was also analyzed season wise viz. September, October and November (Post Monsoon season), December, January and February (winter season) and March, April and May (Pre monsoon season) to know the dominant cost and earnings over different months and season. The results are expressed as mean ± std. error for all the collected data.

RESULTS AND DISCUSSION

Details of species wise revenue according to month from February 2012 – April 2013 is given in Fig. 1. The revenue generated from 15 different fish varieties landed by OBM gillnetters along Veraval, fishing harbour showed that the Ribbon fish contributed maximum revenue (19.30%) among all groups. This was followed by other Indian Mackerel (13.00%), Silver Pomfret (11.71%), Horse Mackerel (11.66%), Silver bar (10.55%), Full beak (6.42%), Streaked Seer fish (6.09%), Spotted Seer fish (5.83%), Croaker (3.36%), Catfish (3.14%), Black Pomfret (2.91%), Indian shad (2.12%), Little tuna (1.74%), Sardine (1.28%) and Long tail tuna (0.88%).

Minimum revenue was recorded during April, 2013 (2.23%). In October, 2012 maximum revenue was generated (19.34%). Out of two groups, pelagic fishes shared (78.89%), and demersal fishes (21.11%) of the total revenue. Revenue was found high in October, 2012 (19.34%) followed by September, 2012 (17.36%). In the Month of February, 2012 contributed (9.05%) revenue, but in March, 2012 revenue slightly decreased to (5.64%) and revenue was again slightly lower in the month of April, 2012 (5.24%) revenue increased in the month of May, 2012 (11.91%); however in the month of September, 2012 there was a drastic increase in the revenue (17.36%), Maximum revenue was found in the month of October, 2012 (19.34). Revenue again decreased (7.33%) in November, 2012, but in the case of December, 2012, the revenue again slightly decreased (4.53%). The revenue in January, 2013 was (4.27%), but again in the month of February, 2013 revenue slightly increased (5.28), the revenue increased in March, 2013 (7.83%), but it was lowest revenue found in the month of April, 2013(2.23%). The month wise and species wise revenue is depicted in the Fig. 1 and 2.

Season wise and Group wise revenue

The data of species wise revenue were pooled together according to Post monsoon season, winter and Pre monsoon season to observe the effect of monsoon season. The Post monsoon season comprised of months of September, October, and November, Winter comprised of December, January, February, whereas Post monsoon season comprise of the months of March, April and May.

The species wise revenue (Rs.) of OBM gillnetters according to season are presented in Table 1.The post monsoon was most productive with contribution of (44.03%), followed by pre monsoon (32.85%) and winter (23.11%). Ribbon fish in post monsoon shared total revenue (26.32%), but beaks shared highest percentage of revenue during pre monsoon (16.84%) and in winter season Indian Mackerel produced maximum revenue (20.51%).

Total revenue generated by an OBM gillnetter for a fishing season was Rs. 45,83,353 where in pelagic fish landings contributed Rs. 28, 16,093 (61.44%) and demersal fishes Rs. 17,67,260 (38.56%). In pelagic fishes, Indian Mackerel contributed maximum revenue with a share of (41.49%) whereas in demersal fishes Silver Pomfret generated maximum contribution of (91.40%).

(4) reported that revenue fetched by Indian mackerel was maximum with 45.97% in case of OBM gillnetter whereas seerfish generated the maximum revenue (71.15%) for IBM gillnetters.

The species wise revenue according to season is presented in Fig1. The winter was most productive with contribution of (37.67%), followed by Monsoon (36.93%) and summer (25.39%). Indian mackerel in winter shared total revenue (26.83%), summer (40.34%) and in monsoon month, Silver pomfret produced maximum revenue (35.24%). The comparison between different seasons gave an idea of share of Indian mackerel in seasonal revenue which was highest in summer (44.41%) and lowest in monsoon (40.65%). Similar findings were also reported by (5) at selected centres along the Maharashtra coast. They reported that the post-monsoon quarter (September-November) were most productive with the seerfish as maximum contributor to gill net fishing. (6) reported April and July to October months as more productive in the year 1981 and the productive months during the year 1982 were April, May and July-October. (7) reported monsoon as the most productive season along the Trivendrum coast, whereas, (8) reported maximum landings in the September. (4) reported peak landings along Ratnagiri coast in the October month.

ECONOMICS

Economic analysis was carried out for OBM gillnetter units. Capital cost, variable cost, fixed cost, total expenditure, revenue and net profit were the major components considered for economic analysis. The economic analysis is shown in Table 2.

Capital cost

Cost of vessel, cost of engine, cost of net and other miscellaneous items with more than one year life span were included to calculate the average capital cost of a gillnetter. The capital investment was Rs. 4,33,137 for OBM gillnetters. In OBM unit, vessel cost alone contributed 38.45% of the total capital cost. Engine cost of OBM was 31.83%. In case of gear accessories (rope, buoys, floats, anchor and sinkers) cost, which shared 19.71% for OBM respectively. (9), Rs. 10,000 to Rs. 50,000for in West Bengal during year 1983-84 (10), Rs. 25,400 and Rs. 52,480 for motorised *catamarans* and motorised *navas* in Kanyakumari district of Tamil Nadu State (11), Rs. 1,05,000 to Rs. 1,23,000 for the gillnetters operated from Cochin fishing harbour during the year 1990 (12) and Rs. 58,000 and Rs. 1,60,00 for the gillnetters operated from Kerala (13), Rs. 3,01,000 to Rs. 4,00,000 for gillnetters operated along Chennai coast during 1991-92 (14) and Rs. 1,48,414 for OBM gillnetters (4).

During the present study, the capital cost of OBM gillnetter was high as compared to many authors (4). The difference in capital cost recorded on higher side in the present study may be attributed the increase in price of raw material.

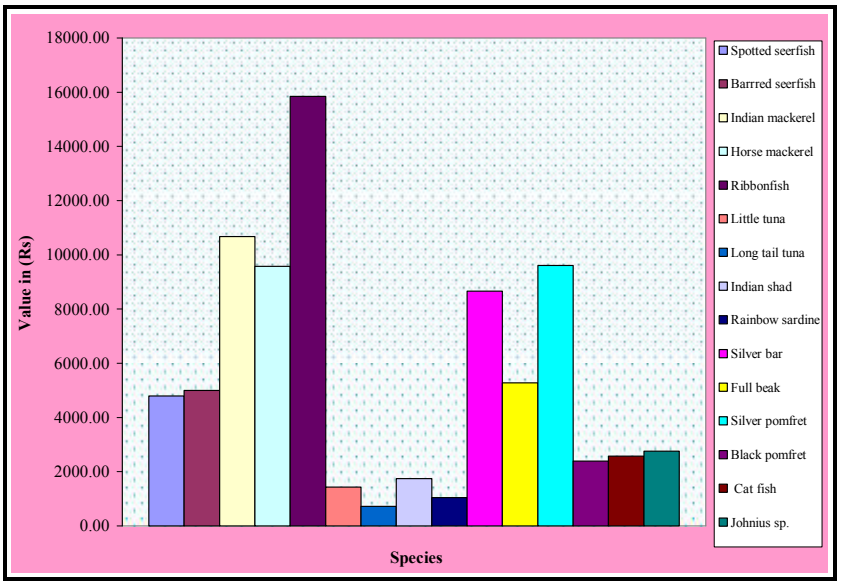

Figure 1. Species- wise fish Revenue (Rs) of OBM Gillnetters operating off Veraval, fishing harbour during February 2012 to April 2013

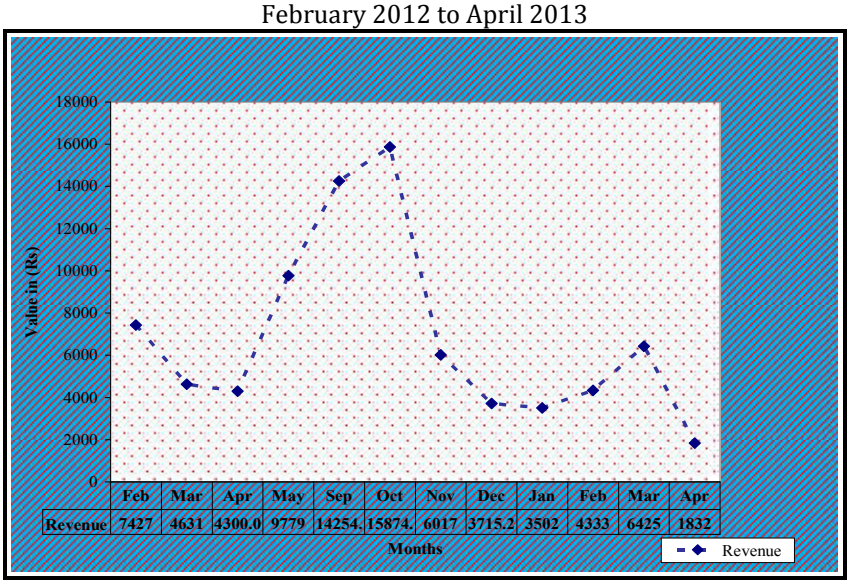

Figure 2. Month- wise fish Revenue (Rs) of OBM Gillnetters operating off Veraval, fishing harbour during February 2012 to April 2013

Table 1. Details of species wise revenue (Rs.) of OBM gillnetters according to season

Sr.No	Species	Post monsoon			Winter			Pre monsoon			Total
		Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	
1	Spotted seerfish *Scomberomorus guttatus*	1577.09 (±266.89)			917 (±104.89)			2294.13 (±280.87)			4788.22
2	Barrred seerfish *Scomberomorus commerson*	1602.87 (±254.08)			1296 (±174.53)			2101.87 (±397.1)			5000.74
3	Indian mackerel *Rastrelliger Kanagurta*	3121.3 (±253.24)			3892.5 (±370.65)			3661.8 (±357.63)			10675.6
4	*Horse mackerel Megalaspis cordyla*	5040.14 (±540.29)			2228.01 (±373.16)			2305.7 (±291.54)			9573.85
5	Ribbonfish *Trichiurus lepturus*	9513.54 (±1313.3)			2626.37 (±300.28)			3703.7 (±660.16)			15843.61
6	Little tuna *Euthynnus affinis*	48.75 (±19.21)			1380.75 (±177.74)			0			1429.5
7	Long tail tuna *Thnnus toggol*	0			726 (±106.33)			0			726.00
8	Indian shad Tenualosa ilisha	354.61 (±55.95)			442.5 (±78.47)			942.9 (±177.42)			1740.01
9	Sardine *Dussumieria acuta*	252.75 (±47.77)			275.37 (±39.82)			519.46 (±84.48)			1047.58
10	Silver bar *Chirocentrus dorab*	4669.79 (±479.86)			1912.73 (±256.57)			2077.84 (±280.99)			8660.36
11	Full beak *Tylosurus sp.*	146.35 (±37.67)			584.38 (±123.4)			4542.25 (±302.92)			5272.98

Values in parenthesis are S.E of mean; (S.E. in some cases could not be estimated due to less number of landing values)

Table 2. Economics of OBM Gillnetters operated from Veraval, fishing harbour during Feb. 2012- Apr.2013.

	Items		Amount (Rs.)
A	**Capital cost**		
	1	Vessel	1,66,533
	2	Engine (two cylinder)	1,37,867
	3	Net	43,333
	4	Rope	49,317
	5	Indicator buoys	20,000
	6	Floats	5,827
	7	Stone sinker	8,443
	8	Anchor	1,817
Total capital cost			**4,33,137.00**
B	**Variable cost**		
	1	Maintenance of vessel	8,633
	2	Maintenance of gill net	4,933
	3	Maintenance of engine(three times in a year)	13,210
	4	License fee, @ Rs.505/-per year	505
	5	Kerosene total 2,160 litres @ Rs.16 /-per litre for 960 litres and Rs. 50/-litre for 1200 litre	75,360
	6	Oil 200 litres @ 100/- per litre	20,000
	7	Petrol 200 litres @ Rs.80/-per litre	16,000
	8	Crew salary	1,10,000
Total variable cost			**2,48,641.00**
C	**Total project cost (A+B)**		**6,81,778.00**
D	**Fixed cost**		
	1	Deprecation cost of Vessel @10 percent	16,653.3
	2	Deprecation cost of engine @10 percent Net	13,786.7
	3	Deprecation cost of net @ 25 per cent	35,833.25
Total fixed cost			**66,273.25**
E	**Total cost (B+D)**		**3,14,914.25**
F	**Total revenue (Rupees)**		**3,70,392**
G	**Profit or Loss**		**55,477.75**

Variable cost

Total variable cost was estimated by considering expenses on fuel, lubricant, wages, fees and repairing and maintenance. The estimated annual variable cost was Rs. 2,48,641.00 for OBM gillnetters. Expenditure on kerosene, oil and petrol had major share 44.79% in the total expenditure. Maintenance of vessel, net, engine and license fee contributed 10.77% for OBM units respectively. Crew salary was found to be other major item of expenditure. Sharing system was followed to calculate the crew salary which contributed 44.24%. (15) reported the variable cost at Rs. 66,337/- in the year 1981-82 whereas the variable cost by other workers ranged from Rs. 88,643 to Rs. 1,13,837 (5) during the year 1986-87, Rs. 1,81,190 to Rs. 3,33,200 (16) in the year 1985-86 as compared to above studies the variable cost of the present studies were higher.

Total project cost

The estimated project cost for OBM gillnetter was Rs. 6, 81,778.

Fixed cost

Depreciation was included in the fixed cost. The fixed cost was estimated at Rs. 66,273.25 for OBM unit. Average life of 10 years was considered to work out the depreciation of vessels and engine whereas, with regard to net, the life expectancy was considered as four years. It was similar to the average life considered by (5). (17) also considered the same life expectancy in case of vessel but considered expected life of 20 years for engine. The fixed cost reported by (17) ranged from Rs. 47,090 to Rs. 54,110 whereas Rs. 23,675 to Rs. 81,700 by (16) at the Versova during 1985-86, Rs. 17,128 by (9) along the Tuticorin during 1987, Rs. 8,820 to Rs. 19,500 for plank built boats by (18), Rs. 82,750 to Rs. 1,04,666 for 12 m vessels operated along the Tuticorin coast.

Total expenditure and revenue

The total expenditure i.e. total cost per year was calculated by adding the total fixed cost and total variable cost which came to Rs. 3,14,914.25. Whereas total revenue was calculated at Rs. 3,70,392.00 for OBM gillnetters.

Profit

The annual profit of rupees 55,477.00 was incurred considering the initial investment in terms of capital cost at the end of first year however second year onwards the OBM gillnetters were more profitable compared to the first year.

CONCLUSION

The result of the present study shows that fishermen of Veraval fishing harbour were in profit of Rs. 55,477.75 at the end of first year of fishing operation. However in the subsequent years, they achieved more profits, because they don't have to purchase the vessel, engine and the nets

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