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Returns from Motorised Traditional Craft in Veraval Coast

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Economic performance of motorised traditional craft operating in Gujarat Coast has been worked out. Average investment on a fishing unit with 12 m craft, 8 HP engine and a complement of gear, works out to Rs. 1.11 lakhs. Average annual maintenance cost works out to 21% of the investment cost. Highest percentage share of maintenance go for engine repair. annual rate of return on investment is 8.72%. Internal Rate of Return of investment works out to 28%. Sensitivity analysis has been carried out on IRR.

Key words: Motorised craft, Internal rate of return, Sensitivity analysis.

Motorisation of country craft has contributed to a substantial increase in the capital outlay of traditional fishing units. Investment requirements of such units range between Rs. one laksh and Rs. 3 lakhs depending upon the size of the craft and horse power of the engine. The engine alone accounts for 30 to 40 percent of the total investment cost. studies on the rate of return on investment portray, that the results vary considerably from place to place and the returns range between a mere 2% to 42% (Annamalai & Kandoran, 1990). This paper reports the findings of a study conducted on the economic performance of motorised craft operating along Veraval coast in the State of Gujarat.

Materials and methods

This study is based on a survey conducted during 1994-95 covering the six villages of Dhamlej, Mul Dwaraka, Sutrapada, Madhuwad, Chorwad and Hirakot of Veraval coast in Gujarat. This fishing belt is well known for large landings of high value food fishes such as pomfret, hilsa, 'ghol' 'dara' and eel in addition to considerable quantities of prawns. The study focuses on the economic performance of the craft of size 12.m. or less, fitted with 8 HP outboard motors. Details of cost, returns and investment were collected by interview method using a pre-tested questionnaire. Analysis of data has been carried out to generate both the conventional index of percentage annual return on investment as well as the internal rate of return, an index of investment appraisal. Sensitivity analysis is done for the latter index.

Results and Discussion

A brief discussion on costs and returns are presented. To begin with the fixed or investment cost, it is composed of three major items of cost of craft, gear and engine respectively. Table 1 shows the aggregates and averages of these cost items for a total number of seventy fishing units. All the three items of cost are adjusted for depreciation at the rate of 10% per year to allow for the wear and tear of the capital assests. After allowing

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Table 1. Unit cost of investment in motorised fishing craft in Veraval coast

Item of Investment	No. of units	Total cost of investment Rs	Unit cost of investment Rs.	Percentage of item to total cost
Craft	70	33,43,620	47,766	43
Gear	70	25,93,000	37,050	33
Engine	70	18,24,260	26,061	24
Total	70	77,61,380	1,10,877 or 1,11,000	100

for depreciation the unit cost of investment on a motorised fishing unit works out to Rs. 1,11,000. The costliest item of investment continues to be the craft accounting for 43% of the total investment, followed by gear at 33% and OBM at 24%.

Distribution of the percentage share of investment over the three main components of a fishing unit is largely decided by the variation in the cost of craft and gear. While the outboard motors are branded and priced for a national market, the craft and gear are more location specific in their make and cost. Their variation affects both are percentage distribution of ivnestment over the components of the fishing units as well as the unit cost of investment. Thus another study (Anon, 1993) that reports a 35:26:36 percentage distribution of investment over craft, gear and motor also reports a lower cost of craft and gear, relative to the cost of motor that is fairly close to the figures presented in this paper. Furher a 10% difference in the unit cost of investment between the two sets of figures is accompanied by a 9% difference in the percentage cost of craft.

Another source of cost escalation in motorisation is identified as the high cost of maintenance. From an average of Rs. 13,700 for craft and gear, the annual cost of maintaining a motorised fishing unit rose to Rs. 23,000. Maintenance cost of engine alone contributed to 41% of the total maintenance cost. Apart from being the highest component of the total maintenance cost, the distribution of the said cost component over the year is also marked by serious financial implications. While both craft and gear are amenable to scheduled, off season maintenance

Table 2. Unit Cost of maintainance in motorised fishing craft

Item of maintenance	No. of units	Total cost of maintenance	Unit cost of maintenance	Percentage to total cost of maintenance	Maintenance cost as a percentage of investment
Craft	70	4,88,500	6979	30	15
Gear	70	4,67,800	6683	29	18
Engine	70	6,49,000	9271	41	36
Total	70	16,05,300	22,933	100	21

work, engine repair due to breakdown occurs unexpectedly. The necessity of making the fishing units operational without loss of time, forces the fishermen to raise funds as frequently as the emergencies occur. Motorised fishing operations are thus tied to cash inputs and attendant high interest costs than the non-motorised operations. While the cash inputs including high interest costs enter into profitability estimates, the revenue losses on account of disruptions in operations, seldom figure as substantial quantities.

Operational cost and revenues are presented in Table 3. The annual gross returns per fishing unit work out to Rs. 1,48,430 of which 24.5% goes to meet the cost of fuel and 37.07% to the crew, as the agreed share. The share of crew in the present study is 50% of the return after fuel cost is deducted from gross revenue. In the case of a few units the share of crew is 3 out of 7. Annual operational profit per unit is Rs. 57,029 which is only 38.42% of the total revenue.

There are three more items of charge on the operational profit of Rs. 57,029 before it is converted into net business profit. These are i) depreciation charges ii) interest charges and iii) annual cost of maintenance. Depreciation at the rate of 10%, interests at the rate of 12% of the the investment and the annual cost of maintenance as given in Table 2 make a total of Rs. 47,353 thus leaving Rs. 9676 as net business profit per year. Rate of return on investment thus work out to 8.72% which is higher than the rate reported in another study (Anon, 1993).

The internal rate of return of an investment of a project is defined (Prasannachandra, 1980) as the rate of discount which brings about equality between the present value of future cash flows and the initial investment. It is the value of 'r' in the following equation:

$$i = \sum_{t=1}^{n} \frac{At}{(1+r)^t}$$

i = Total investment on the project

At = Net cach flow or return at time t

n = number of years of life of the project

r = The internal rate of return (IRR) that equates the two sides of the equation

The above equation can be expanded to obtain the following numerical form:

$$1,11,000 = \frac{34,100}{(1+r)} + \frac{34,100}{(1+r)^2} + \frac{34,100}{(1+r)^3} + \ldots\ldots + \frac{34,100}{(1+r)^{10}}$$

Where (i) the amount of Rs. 1,11,000 is the average initial investment on a fishing unit (Table 1), (ii) Rs. 34,100

Table 3. Operational cost and revenue

No. of Units	Items of cost/ revenue	Total of cost/revenue	Average for units Annual Rs.	Per trip Rs.	Percentage to total revenue
70	Gross revenue	103,90,000	1,48,430	825	100
70	Fuel cost	25,46,755	36,383	202	24.51
70	Labour cost	38,51,226	55,018	306	37.07
70	operational profit	39,92,019	57,029	317	38.42

Table 4. Internal rate of return for different levels of change in cash flow - sensitivity indices

Cash flow/ IRR	Base level Flow IRR	Levels of Change in cash flow and relevant IRR			
		5% rise	10% rise	15% rise	20% rise
Investment cost	1,11,000	1,16,550	1,22,100	1,27,650	1,33,200
IRR	28%	26.5%	24.9%	23.5%	22.2%
Net change	0	(-) 1,5%	(-) 3.1%	(-) 4.5%	(-) 5.8%
		5% fall	10% fall	15% fall	20%
Net profit	34,100	33,240	31,280	31,370	30,460
IRR	28%	27%	26%	25.4%	24.3%
Net change	0	(-) 1%	(-)2%	(-) 2.6%	(-) 3.7%

is the net annual return after deducting annual maintenance cost form operational profit (Table 2 and 3). Life of the fishing unit is estimated to be 10 years.

The numerical equation solves for the value of r = .28

Internal rate of return for the project thus works out to 28%. For any cost of capital less than 28%, the project of motorised fishing unit has economic worth. Since interest rates range from 11% to 16% for loan from financial institutions, the project is worth investing.

It is obvious that the internal rate of return will be sensitive to the changes in the cash flows that enter the equation. Extent of change in the internal rate of return for a given change in the cash flow is an important measure of sensitivity of the above index. A sensitivity analysis is, therefore, carried out to measure these changes. Among the cash flows that enter the equation, the investment of Rs. 1,11,000 can change when cost of craft, gear or motor changes. The cash flow of net return Rs. 34,100 can change when prices or quantities of catch change, or fuel cost changes. Sensitivity analysis is therefore done for four levels of investment cost escalation at respective levels of 5%, 10%, 15% and 20%. Like wise the exercise is carried out for 4 levels of fall in net profit by 5% , 10% and 20%. Results are presented in Table 4. It may be observed that the changes in IRR for different levels of change in cash flows are just marginal and the maximum adverse change of 20% rise in investment cost or 20% fall in net returns still leaves the internal rate of return above 22.2% and 24.3% making the investment quite attractive.

To conclude, indices of both annual rate of return on investment and internal rate of return show that the motorised traditional fishing units off Veraval Coast are economically viable. Sensitivity analysis on internal rate of returns show that the viability is not affected up to 20% of adverse changes in the relevant cash flows.

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