

PRELIMINARY ECONOMIC EVALUATION OF 10 METRE  
(LOA) SHALLOW DRAFT VESSEL IN DAILY FISHERY,  
OFF IMO RIVER, CROSS RIVER STATE

by

R.E.K. Udolisa and B.B. Solarin  
Nigerian Institute for Oceanography  
and Marine Research  
P.M.B. 12729  
Lagos

ABSTRACT

Scientist from the Institute with the collaboration of Food and Agricultural Organisation (FAO), Rome designed and built a 10 metre (LOA) shallow draft vessel. The prototype vessel was tried at Uta-Ewa, Ikot Abasi, Cross River State. The paper deals with the preliminary economic analysis of the performance of prototype vessel. An analysis of the annual return has shown that 43.66% of the annual gross income was paid to labour; 15.91% was spent on repairs and replacements; 7.76% on fuel and lubricants; 24.38% on maintenance costs and the return of investment, 6.2%.

This low return of investment is attributable to high percentage of labour costs as well as low fishing intensity.

INTRODUCTION

Natural coastal conditions in many developing countries such as Nigeria, and India constitute an important restraint to the development of coastal and inshore fisheries with modern as well as improved mechanised fishing vessels. In the coastal areas of Bendel, Rivers and Cross River States, the mouths of the sheltered rivers are often blocked by sand bar which allow only vessels with shallow draft to pass through at low tides. Sand bars are submerged mound of sediments lying across the riverine estuaries with the crests at their lowest point lying 1.83 - 3.66 metres. The geometry of the bars are determined by a resolution between the waves, the longshore drift and the power of the discharging rivers. The annual discharge of River Niger through its estuaries has been estimated to be 21,800 cubic metres (Scott, 1966).

The mouth bar of Imo River, for example has been described as strongly curved in shape with a width of 12.0 km and a maximum depth on the bar crest of 1.83 metres (Allen, 1964). Turbulent foaming waters, called plunging breakers from directly over the bars, causing fishing vessel accidents at riverine mouths. Any vessel that has to be developed for usage in these areas, must have shallow draft as well as the ability to withstand and manoeuvre the plunging breakers.

Scientists at the Institute and those of the Food and Agricultural Organisation (FAO), Rome, have therefore through research established a fishing vessel design that is capable of crossing sand bars as well as fishing in Nigerian coastal waters. Fishing trials were therefore, conducted at Uta-Ewa, Ikot Abasi in Cross River State between November 1981 and November 1982 with the prototype vessel in order to establish whether the vessel is economically viable.

METHOD

Fishing trials were conducted off Imo River with the 10-metre (LOA) prototype fishing vessel known as "Shallow Draft 1 (SD1)".

The vessel has the following main particulars:-

Length over all (LOA)	9.83m
Length DWL	8.73m
Beam moulded	3.50m
Beam DWL	3.41m
Depth moulded	1.21m
Displacement to DWL	12.30m <sup>3</sup>
Fish hold capacity approximately	5.80m <sup>3</sup>
Engine	63 HP

The vessel did daily fishing with a demersal trawl-net of 18 metres headline length and flat rectangular Otter boards.

#### RESULTS AND DISCUSSION

The investment cost, annual revenue and total operating outlays are shown in Table 1 and calculated on the method used by Fyson (1980).

##### a) Investment Costs

The prevailing market price of N53,00.00 for the prototype vessel was obtained from the boatyard, where the vessel was built.

##### b) Annual Revenues

These were obtained from catch volume and market values of the different species of fish caught. Catch volume is a function of catch rate and fishing intensity. The latter is calculated by number of daily trawling hours (6.5) multiplied by number of fishing days in the year (170 days). The annual revenues were calculated to be N39,780.00.

##### c) Total Annual Costs

The total annual costs have been divided into sections II and III of Table 1. The costings for the individual headings are as follows:-

- i. Labour: These include the cost of maintaining a fleet manager (shore captain); the salaries of the crew (four) as well as their bonuses and food. These total labour costs accounted for 43.66% of the gross annual income.
- ii. Repairs and replacement costs: The costs are for engine overhaul for the year, hull repairs, gear repair as well as replacement and miscellaneous charges. These accounted for 15.91% of the gross annual revenues.
- iii. Fuel and lubricants: The total cost for fuels and lubricants amounted to N3,085.50 which accounted for 7.76% of the gross annual income.
- iv. Maintenance costs: The costs include depreciation values which have been estimated to be 10% of the total investment costs of the vessel, since the economic life time of the vessel is ten years. The insurance rate and vessel hull maintenance costs have been included under this heading. The insurance rate is 5% of the sub-total costs of the hull and machinery. The total maintenance costs accounted for 24.38% of the gross annual income.

v. The Return of Investment: This has been calculated to 6.2%.

The low return of investment is due to high labour costs and low fishing intensity which was 1105 fishing hours for a year.

Table.1 - Revenue and expenses analysis of SD 1

i) <u>Investment Costs</u>	
(a) Hull equipment	N35,000.00
(b) Machinery and Installation	18,000.00
(c) Sub-total, Hull and Machinery	53,000.00
(d) Fishing Gear	9,000.00
Total Investment	<u><u>N62,000.00</u></u>
ii) <u>Annual Fixed Costs</u>	
(a) Depreciation 10% 1(c)	N5,300.00
(b) Insurance	2,650.00
(c) Vessel Hull Maintenance	1,750.00
(d) Crew Basic Salary	7,440.00
(e) Fleet Management	6,560.00
Total Fixed Costs	<u><u>N23,700.00</u></u>
iii) <u>Annual Revenue</u>	
(a) Hourly Catch Rate	30kg/hr
(b) Average daily catch	195kg (6.5hrs/day)
(c) Annual catch	33.150kg
(d) Average price of fish	N1.20k/kg
(e) Total annual revenue	N39,780
Return on Investment	$\frac{3298.5 \times 100}{53,000} = 6.2\%$

#### REFERENCES

- Allen, J.R.L. (1964) The Nigerian continental margin: Bottom sediments, submarine morphology and geological evolution. *Marine Geology*, 1 (1964) 289 - 332
- Fyson, J.F. (1980) Fishing boat designs: 3 Small trawlers. *FAO Fish. Tech. Pap.* (188): 51p.
- Scott, J.S. (1966) Report on the Fisheries of the Niger Delta Special Area. 109 p.