

ECONOMIC POTENTIALS OF "IKEN" BRUSH PARK FISHING PRACTICE IN IWOPIN LAGOON, OGUN STATE, NIGERIA

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ABSTRACT

A study on economic potentials of "Iken" brush park fishing practice was carried out in Iwopin Lagoon, Ogun state, Nigeria. The practice offered a good catch 0.4802 tonne per fisherman per fishing. Financial analysis at the end of the year of operation indicated that a total of N677,945.00 was invested on the "Iken" out of which N180,500.00 and N497,445.00 were fixed and variable costs respectively and N804,304.00 was realized as profit (without tax). The profitability analysis showed that "Iken" brush park fishing practice could generate a rate of return to investment of 44.9%, a rate of return on fixed cost of 268.6%, a rate of return on variable cost of 161% and a rate of return on labour cost of 193%. It was therefore recommended that efforts should be directed towards providing adequate fund to provide adequate background information on how the fishery could be developed, protected and sustained since economically it has been proven to be viable and in a long way has helped to alleviate the widely campaigned poverty among the Nigerian rural inhabitants.

INTRODUCTION

Statistics available have shown that fish demand by the over 100 million people of Nigeria far outstrips the supply. Therefore, an urgent need to increase local fish production to meet the shortfall in the demand is a priority. According to Solarin and Udolisa (1993), Nigeria has over 700, 000ha of creeks, lagoons and estuaries and new methods of fishing are being examined to enhance fish production. Brush parks which facilitated the aggregation and capture of fish in Lagos and Lekki Lagoons have been reported on by the Food and Agriculture Organisation (1969). Reed (1967) had earlier observed fish shelters used in riverine freshwater environments of northern Nigeria. Also welcome (1972) evaluated the brush park method of fishing in coastal lagoon of Dahomey (Now Benin Republic). The bush park fishing method creates an artificial habitat and is practised mostly by coastal fishermen of West African sub- region who had

migrated eastwards of Nigeria. Among the brush park fishing devices is "Iken".

"Iken" is described as a local term given to an aggregation of plants with adventitious roots kept floating and allowed to grow on water surface. It is a traditional fishing practice common in Iwopin Lagoon in Ogun state. It is akin to "acadja" which is popular in Lagos and Lekki Lagoons of Lagos state. It attracts, aggregates and regenerates pelagic, resident and migration fishes (Alegbeleye et al., 2000; Sureh, 2000). Solarin (1992) had earlier remarked that the brush park devices on Nigerian waters are strategic options for enhancing viable fishing system as well for increasing fish production. It has also been shown to increase productivity of coastal lagoons and inland waters through migration, reproduction and growth of fish inside the brush park (Hem and Avit,

1996). Fish yields in a brush park vary from 0.01 - 3.8 kg/ m²/ yr (ICLARM- GTZ, 1991; Welcomme and Kapetsky, 1981). Brush parks also offer a number of economic advantages, inter alias, in the management of small scale fisheries in coastal lagoons, unfortunately, there is scanty information in its' potential. Hence, this study which was focussed on the economic potentials of "Iken" brush park fishing practice a being practised in Iwopin Lagoon in Ogun State.

MATERIAL AND METHODS

Frame survey

A frame survey of "Iken" fishing practice was carried-out between January 2002 and August 2002 in Iwopin Lagoon, Ogun water side Local Government Area of Ogun State. This period coincided with the time of construction and harvesting. The catches from "Iken" were randomly assessed covering 300 of the potential fishermen. The fishes were identified based on the nomenclature of Olaosebikan and Raji (1998). Each fish species was counted and weighed to the nearest gramme. This was used to determine the economic contribution of each species. Cost and time of constructing "Iken" brush park, the size and time it was kept in water before harvesting, average number operated by individual fisherman (owner), costs of imput materials (such as canoes, nets, maintenance) etc cost labour, marketing channel(s) preservation methods and eventual revenue made per fisherman per total number of "Iken" operated per annum.

Economic and profitability analyses

The economic and profitability analyses as drescribed by Ayinde and Aromolaran (1998) and Otubusin (2001) were adopted. Net income of fisherman practising "Iken" fishing was calculated for the first year. This analysis was used in the profitability analysis to calculate return to management, capital and family labour, return to

investment, return on fixed cost or gross margin, rate of return on fixed cost, rate of return on variable cost and rate of return on labour cost.

Return to Management, Capital and Family labour (RMCF):

$RMCF = TVP - TFC - TVC$ Less cost of capital borrowed and cost of family labour.

Rate of Return to Investment (RRI):

$$RRI = (RMCF/TC) \times 100$$

Return on Fixed Cost (RFC) or Gross Margin (GM):

$$RFC = TVP - TVC$$

Rate of Return on Fixed Cost (RRFC):

$$RRFC = (RFC/TFC) \times 100$$

Rate of Return on Variable Cost (RRVC):

$$RRVC = ((TVP - TFC)/TVC) \times 100$$

Rate of Return to Labour Cost (RRLC)

$RRLC = TVP - \text{All costs except labour cost} / \text{total labour cost (man/day)} \times 100$

Where,

TVP - Total value of product

TFC - Total Fixed Cost

TVC - Total Variable Cost

TC - Total Cost

RESULTS AND DISCUSSION

The catches from "Iken" fishermen were assessed. The fishers achieved a mean harvest of 480.216kg/ha (0.48 tonne) of fish per fisherman per fishing. An average of five "Iken" per individual fisherman was noted thereby making a production of 2401.08kg (2.401 tonnes) per individual fisherman in 6 months. This value was estimated to give a fish production of 4802.16kg (4.802tonne) per fisherman per annum. Fish caught (Table 1) were always sold in water to fish mongers from Epe, Lagos state or to fishermen's relation who might had sponsored them for fishing. All fishes were caught alive and sold either singly, in basket, and in fifteens. In some cases if they were not sold the day they were caught, the fishes were usually held alive in cages

or traps and then submerged in water. Costs of constructing "Iken" depending on the size and fisherman's relationship with the labour employed are shown on Table 2. It ranged between N15,000 -

N33,000.00. The larger the size of "Iken" bush park the higher the construction cost. But during harvest the fisherman and labour employed shared the money (revenue) made in the fish sold in ratio 2:1

Table 1. Fish production in "Iken" fishing practice per fisherman per six months

| Family name | Species name | Mean number of fishes | Weight of fish (kg)/fishing/ha | % | Price (₦) |
|----------------|------------------------------------|-----------------------|--------------------------------|------------|-----------------|
| Bagridae | <i>Chrysichthys nigrodigitatus</i> | 71 | 49.803 | 10.37 | 12911.40 |
| Cichlidae | <i>Sarotherodon melanotheron</i> | 161 | 161.087 | 33.55 | 19100.08 |
| " | <i>Tilapia mariae</i> | 69 | 50.980 | 10.62 | 5114.86 |
| " | <i>Tilapia zillii</i> | 59 | 31.724 | 6.61 | 3167.35 |
| Gymnarchidae | <i>Gymnarchus niloticus</i> | 9 | 31.667 | 6.50 | 16394.79 |
| Hepsetidae | <i>Hepsetus odoe</i> | 15 | 6.202 | 1.29 | 620.21 |
| Mochokidae | <i>Synodontis spp</i> | 42 | 4.493 | 0.94 | 781.32 |
| Mormyridae | <i>Mormyrops anguillalus</i> | 11 | 12.813 | 2.67 | 2520.38 |
| " | <i>Mormyrus rume</i> | 15 | 16.884 | 3.52 | 3432.53 |
| Neptoteridae | <i>Papyrocramus afzer</i> | 10 | 2.050 | 0.43 | 205.03 |
| Osteoglossidae | <i>Heterotis niloticus</i> | 11 | 41.264 | 8.59 | 16173.30 |
| Polynemidae | <i>Polydactylus quadrifilis</i> | 26 | 71.249 | 14.84 | 17812.23 |
| | Total | 498 | 480.216 | 100 | 98233.48 |

N119.55 = US\$1

Table 2. Cost of Constructing New "Iken"

| Size ("efon") | Cost (₦" 000) |
|---------------|---------------|
| 15 - 20 | 15 - 19 |
| 20 - 25 | 19 - 20 |
| 25 - 30 | 20 - 22 |
| 30 - 35 | 22 - 25 |
| 35 - 40 | 25 - 33 |

1 "efon" equals 782m². N119.55 equals US \$1

("Efon" is a local dimension of "Iken" brush park)

Table 3 shows that at the end of one year of operation, a total of N677,945.00 was invested on five "Iken" brush parks out of which N180,500.00 and N 497,445.00 were fixed and variable costs respectively. Individual fisherman spent N132,000.00 on fish fence, N5,000.00 on rentage of some net, N327,445.00 on labour, N28,000.00 on canoe rentage and N5000.00 on brush park maintenance. On fixed cost he spent N75,000.00 on fishing crafts, N90,000.00 on "Iken" installation

N4,000.00 each on nylon net and synthetic rope. An economic analysis indicated a fisherman net income of N304,384.80. Profitability analysis shows that return to management, capital and family labour (RMCF) and Return on Fixed Cost (RFC) were N304,389.80 and N484,889.80 respectively. Whilst, rate of returns on investment (RRI), fixed cost (RRFC), variable cost (RRVC) and labour cost (RRLC) were 44.9%, 268.6%, 161% and 193% respectively (Table 4).

Table 3. Economic income analysis of "Iken" brush park fishing practice

| ITEMS | VALUE (₦) |
|--|------------|
| A. INCOME | |
| 1. Sales of Fish Per Year | 982,334.80 |
| | 982,334.80 |
| B. COSTS | |
| 1. Variable Cost Per Year | |
| i. Fish fence --- 4 @ N33, 000.00 each | 132,000.00 |
| ii. Seine net (63.5mm) Rent 5 times @ N1, 000.00 / day | 5,000.00 |
| iii. Labour (5 "Iken") | 327,445.00 |
| iv. Maintenance | 5,000.00 |
| v. Rentage of 2 canoes @ N400/day for 5 "Iken" for 7 days | 28,000.00 |
| | 497,445.00 |
| 2. Fixed Costs | |
| i. Fishing Crafts | 75,000.00 |
| ii. "Iken" installation (5) | 90,000.00 |
| iii. "Veranda" net (nylon mesh) | 4,000.00 |
| iv. Synthetic rope (Ø2cm) | 4,000.00 |
| v. Fish Traps---15 @N500.00 each | 7,500.00 |
| Total fixed costs | 180,500.00 |
| Total cost | 677,945.00 |
| Net Income (A - B) | 304,389.80 |
| ₦119.55 = US \$1 | |

Table 4. Profitability analysis

| Profitability ratios | Value |
|---|-------------|
| Return to Management Capital and Family Labour (RMCF) ₦ | 304, 389.80 |
| Rate of Return to Investment (%) | 44.9 |
| Return on fixed Cost, RFC/Gross Margin (GM) | 484, 889.80 |
| Rate of Return on Fixed Gross RRFC (%) | 286.6 |
| Rate of Return on Variable Costs, RRVC (%) | 161% |
| Rate of Return on Labour Cost RRLC | 193 |

The profitability indices show that "Iken" brush park fishing practice is a profitable business in the study area. Every N1 invested in the business generated 45 kobo as profit. According to Ayinde and Aromolaran (1998), calculated rate of return to investment is acceptable only if the opportunity cost of capital and family labour utilized in agricultural business is zero. Also since the current interest rate

on agricultural loan in the economy as at the time of the study was 22.5%, "Iken" brush park practice was a profitable enterprise. Also every N1 cost incurred on fixed assets generated about N2.69. If this is compared with the rate of return on variable cost, it can be deduced that improving profitability in "Iken" brush park fishing practice in the study area will require that more effort be

put into increasing the efficiency of use of variable input items especially labour which was about 48.3% of the total production cost. This can be further substantiated with the calculated rate of return on labour cost 193.3%. That is, for every N1 spent on hired labour about double the amount

went back to the fisherman. According to Otubusin (2001), economic viability of any fisheries business depends on the interplay of various complex factors. The fisherman should aim at cutting down production cost in order to increase the return on investment.

CONCLUSION

This study has revealed that "Iken" brush park fishing practice offered a good catch to the fisherman in Iwopin Lagoon area. Meanwhile, economic analysis shows that the practice is

profitable and has helped in no small way to develop the fishery and has alleviated the widely-campaigned poverty among the Nigerian rural inhabitants.

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