

AQUACULTURE INVESTMENT IN NIGERIA: CASE STUDY OF NEW BUSSA

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ABSTRACT ✓

Hunger and malnutrition have remained amongst the most devastating problems facing the majority of Nigerian poor. These challenges and other social and economic objectives are the main forces driving aquaculture development to augment for food deficient, in particular fish, which is the cheapest source of protein. However looking at the aquaculture potential and the demand for fish, more needs to be done in aquaculture sub-sector. Unfortunately, despite the increase awareness, many people still remain skeptical about returns in aquaculture investment. This backdrop prompted the study, which empirically analyzed the situation based on two (2) semi-concrete ponds at NIFFR. The results which were extrapolated for five years shows a cost benefit ratio of 1.8, which indicated worthy investment. The results would essentially serve as guide to practitioners and intended fish farmers.

INTRODUCTION

The growing need for fish supply and increase awareness of aquaculture in Nigeria has led to remarkable investment in aquaculture in recent years. However, the growing population in the country posed a challenge, which requires more investment to fill in the supply gap of 1.6 million metric tones (Fishnetwork, 2009). Apparently, in order to fully transform and harness the potentials of the sub-sector, investors need to distinctively understand the economic and financial benefits attached to aquaculture, which less attention has been given over the years. Generally, in order to decide whether an investment should be undertaken or whether one particular investment should be preferred to another, one needs to have some kind of empirical data or evidences for evaluation. While this study is empirically based, it adheres to the fact of prevailing financial predicaments in the country, and assumed that all money used is the investment was loaned and extrapolation for five years was made. The paper aimed at discussing the 'nitty gritty' involved in financial investment, which are often neglected or unknown to many and causes problems in business.

MATERIALS AND METHODS

Two semi concrete ponds were used, with an area of 360m² (18 m x 20m), with depth of about 1.5m. The stocking density of each pond was 10/m² therefore a total of 3600 catfish fingerlings were stocked in each of the ponds as well as 1800 Tilapia fingerlings (stocking density of 5m²), which serve as supplementary feed to the Catfish. In addition, 45% crude protein diet was fed at least for about three months at 5% body weight/day. Thus, 25kg of the feed was given in the first three months, 50kg through the 3rd and 4th month at which the fish has reached a 3% body weight, 75kg through the 5th and 6th, while from 7th to the 9th month 100kg was fed at which the fish was harvested at the end of the 9th month. Cost/benefit ratio was used in determining the viability of aquaculture in the first year, while cost/benefit analysis was used to determine its profitability using the net present value.

$C/B = \frac{\text{present worth of benefit}}{\text{Present worth of cost}}$

Present worth of cost

$$PV = B_0 - C_0 + \frac{B_1 - C_1}{(1+r)} + \frac{B_2 - C_2}{(1+r)^2} + \dots + \frac{B_n - C_n}{(1+r)^n}$$

NPV = PV - Depreciation

Where

C/B net value

B - Benefit

C - Cost

NPV - Net Present Value

r - Interest rate at 5% for 5 years

Evaluation Criteria

There are several tools or measures for evaluation of any investment. However the choice of the tool to use depends on what the investor's main concern in the investment is. In cases where the main

objective is to recover the invested capital in the shortest possible time, 'pay-back period is used as a tool for decision. In other cases the objective is to get the maximum return on owned invested capital. In this study it is assumed that the capital used in the investment is borrowed with interest if both are to be recovered within five years, the aim of the investor is therefore to maximize the return on the total capital invested.

Concept of Present value

The basic reason underlying the present value concept is that money has an earning capacity. The earning capacity varies according to how the money is used. Money may be used to buy shares, deposited with bank or loaned, etc. In most cases the owner of the money expects to receive a return either in form of interest or dividends varying with the time that he does not dispose of the money.

Practical application of Cost Benefit Analysis

Cost benefit analysis is usually used as an economic tool to determine the profitability as well as the viability of an agricultural project to be undertaken. In this case it was used to find out its profitability within the next five years. The cost benefit ratio indicated that the project is viable (1.8) thus worthy of investing into. Hence, the estimated total cost of establishing two semi-concrete pond of 18m by 20m of 1.5m depth is 1,150,000 (table 1), this include fixed capital investment of N445,000 with the operating cost of 705,000. The operating cost decreases in the second year (N80, 000) but gradually increases through the third to the fifth year. The recurrent cost of about N291, 500 was spent in the first year of operation, but this also gradually increases with time and inflation N330, 661 in the fifth year (Table 2). Table 3 shows the depreciation value of the fixed assets for five years although most of which will last for about 50years. Table 4 shows the loan repayment schedule with the highest payment in the first year. Table 5 shows the output sales in the successive 5 years, sales increases due to inflation and the Net Present Value (NPV) is N10,310,593 while the Present Value of N10,492,825.3.

Table 1: Input for Pond (2) Construction/Accessories for 5 Years

Year	Land acquisition & clearing (N)	Excavation/ Concrete (N)	Inlet monk (N)	Fencing (N)	Cast net (N)	Borehole (N)	Total (N)
1	160,000	585,000	120,000	90,000	45,000	150,000	1,150,000
2		60,000	20,000				80,000
3		70,000	30,000				100,000
4		75,000	30,000				105,000
5		90,000	50,000				140,000

Table 2 Recurrent Cost (2 ponds)

Year	Fish seed	Qty.	Feed (N)	Manure supply (N)	1 attendant	Security	Contingency (N)	Total (N)
1	Tilapia catfish	36,000	72,000	4000	45,000	36,000	26,500	291,500
2		72,000	73,440	4,080	45,900	36720	27030	297330
3		36,720	73,440	4162	46818	37455	27571	303279
4		74909	74909	4245	47755	44946	29471	324178
5		44946	76407	2330	48710	45845	30060	330661
		76407	77935					
		45845	77935					
		77935						

Table 3 Depreciation of Capital Assets for 5years

Year	Annual depreciation (N)	Depreciation value (N)	Remaining balance (N)
1	10% of 445000	44500	400500
2	10% of 400500	40050	360450
3	10% of 360450	36045	324405
4	10% of 324405	32441	291965
5	10% of 291965	29197	26216
Total		182232	

Table 4 Repayment of Loan in 5years at 8% Interest Rate

Year	Principal (N)	Total payment (N)	Interest (8%) (N)	Loan balance (N)
0				1441500
1	288300	311364	23064	1153200
2	288300	306751.2	18451.2	864900
3	288300	302138.4	13838.4	576600
4	288300	297525.6	9225.6	288300
5	288300	292912.8	4612.8	

Table 5 Output of ponds for succeeding 5 Years

Year	Tilapia	Catfish	Total output	Present value
1	540000	2160000	2700000	1258500
2	550800	2203200	2754000	2546667
3	561816	2247264	2809080	2457215
4	573120	2292480	2349792	1940686
5	584640	2338560	2923200	2289757
			Total	10492825.3

NPV = 10310593.3

CONCLUSION AND RECOMMENDATIONS

Aquaculture is said to be a promising venture in the country, it is now a means of creating employment and more to that income and wealth. It is also a means of sustaining the artisanal fisheries sub-sector. Aquaculture investment is strategically important to meet the expected million metric tones of fish production within the decade so as to meet the expected demand of the ever rapidly growing population in the country; it will also reduce the need for fish importation into the country. The system of aquaculture is important to all developing countries especially Nigeria whom is interested in food security, economic development, poverty alleviation and reduction of unemployment. Therefore, with the on going privatization, all farms that fall short of expectations should be privatized as a means of poverty alleviation and rural empowerment. Research work should be extended to the rural populace most of which are unaware of the golden opportunities in fish aquaculture.

REFERENCES

- Agbebi, F.O. & Fagbenro, O.A.(2006) Tilapia culture and risk management in Nigeria. Proceedings of the Seventh International Symposium on Tilapia in Aquaculture (ISTA 7), pp.262-266. (W.M. Contreras-Sanchez & K. Fitzsimmons, editors). Veracruz, Mexico.
- Ayanda J. O. and Okoye F. C. (2003). Economics of Fish Culture Production. Paper Presented at the Annual Conference of the Fisheries Society of Nigeria (FISON) 2003.
- Cho, Y. G. (2001). Building the Information -Base for Aquaculture Policy Making, Planning and Management. Aquaculture in the Third Millennium, Bangkok, Thailand, 20th-25 Feb. 2000 pp 212-128
- Ezenwa, B. L., O. A. Ayinla and A. M. Ajana (2001). Aquaculture Research Technology Transfer for Rural Development in Nigeria FISON 2001, pp1-6
- FAO (2000). FISHSTAT plus-version 2.3

FAO (2001). Aquaculture in the Third Millennium Pp342

Fishnetwork (2009). Positioning the Fisheries Sub-Sector for Vision 20-2020 A quarterly Publication of the Fisheries Society of Nigeria (FISON) Vol.5 No. 4 Jan-Mar 2009.

Houtte, A. V. (2001). Aquaculture Development and Management. Aquaculture in the Third Millennium, FAO 2000

Machena C. and J. Moehl (2001). African Aquaculture: a Regional Summary with Emphasis on Sub-Saharan Africa. Aquaculture in the Third Millennium, pp341-355

Miller, J. (2003). Aquaculture Professional Organizations. The Future of Nigeria's Aquaculture Industry in your Hands FAO Pp5

Okorie, U. P. (2003). Nigerian Fisheries at a Time of Economic Paradigm Shift. Fisheries Society of Nigeria (FISON) 2003. Pp12

UNDP (2007). Hands on: Lungfish to Lagos-Nigeria United Nations Development Programme. Series 2 publication Pp1