FISH FARMING IN ANAMBRA STATE: ECONOMIC CRITERIA

by

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ABSTRACT

The paper is based on the premise that an understanding of the role and potentials of fish farming enterpreneurs in terms of their activities and expectations would enhance fish production and productitivity. To this end, the present paper investigates the activities of 24 fish farmers in Anambra State, Nigeria.

Based on the fish farmers' experience, the paper presents fish farming investments, budgets and recommendations that could ensure fish farming development as a profitable business venture and at the same time ensure greater fish production in the country.

INTRODUCTION

The farming of food fish in Nigeria began as a hobby in the 1940's in Lagos and Ibadan by the then expatriate Fisheries Officers. The first commercial fish farm was established in Panyam, near Jos in 1952. By 1979, nearly every State in the Federation was involved in the development of a fish farming pilot project. From then on, the recreational production of food fish was replaced by commercial food fish market.

In the commercial operation, the producer who is now a private investor rather than a government agency, performs the production, distribution and marketing functions, and with it food fish culture in Nigeria has expanded tremendously between 1981 and 1985. Regardless of the distribution mode, food fish culture in Nigeria as in other parts of the world is capital intensive. Even where inputs are at a minimum, the fixed capital expenditures are still relatively high.

Fish farming in land-locked States must have some type of impoundment constructed using either manual labour or machine labour. In addition, commercial food fish operations require relatively high operating capital expenditures especially when the system is intensive* in nature.

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* If formulated rations are fed to achieve a shc ter growing period.

Available statistics show that few potential producers have enough capital to construct ponds and that some form of credit has to be used (Esobhawan, 1986; Ezeife, 1985; Obuseh, 1986; Ofor, 1984; Williams, 1983). Capital for fish farming enterprise must be acquired through long-term financing arrangements. Also, short-term loans are frequently required to finance operating day-to-day activities. Therefore, bank officials or financial institutions should look further than an individual's character and collateral when considering whether or not to lend an individual money to begin a food fish culture operation. Every potential borrower wishes to succeed in his venture, therefore, both the creditor and the debtor want to carefully evaluate a new enterprise such as food fish production before making any commitments. It is therefore, important to define the perspective from which an economic analysis is done. This is important because human desires and needs vary greatly, and economic analysis may result in contradictory results depending on whose perspective the economic analysis is carried out.

Thus, the purpose of this study is to present a means of evaluating fish farming enterprise from an economic standpoint. The example used here is from Anambra State, Nigeria. The computation is that of a generalized situation based on average conditions. However, the farmer's perspective is used as a focal point because of his need to succeed. Therefore, any fish farmer should be liable to analyze his enterprise using his own personal data in the same manner. Prior planning in this manner would result in better decision-making.

A basic assumption for this analysis considers fish production as an integrated enterprise on an existing farm that has other crops and livestock operations as was observed in Anambra State.

METHODOLOGY

The methodology consisted of enterprise budget developed from production costs incurred by the fish farmers in Anambra State. The enterprise budget approach is chosen because it gives a general idea of whether the farmer's investment of capital and labour is worth the effort or whether there are sufficient returns in cash or in kind to justify the effort put into the farming activity. The survey results are described under two headings:

- assessment of the area for food fish production, and
- preparation of enterprise budgets for 1-, 5-, and 10-hectare ponds.

The survey was carried out between December 1984 and February 1985.

RESULTS AND DISCUSSIONS

Assessment of the Area for Food Fish Production

In establishing a freshwater fish farm, several technical factors must be considered.

a) Water Quality and Supply

Water is a pre-requisite for food fish culture. In the case of Anambra State, field survey results indicated that there are several rivers and streams that will provide the ponds with perennial water of good quality throughout the year.

It was also recorded that all the fish farm operations in Anambra State during the period the survey was carried out were all sited near a river or stream.

b) Soil

Soils with a high percentage of clay material are considered to be quite adequate for pond construction because of the clay's quality for high water retention property. Anambra State has good land areas rich in clay soils.

c) Topography

The shape of the land is important when considering the location of pond sites. Anambra is noted for her hills, albeit, private farmers who have already invested in fish farming received good advise from fisheries experts in the Federal, State and Local Government agencies. Summary of pond construction costs showed that the 24 private fish farmers in the State as of February 1985 spent a total of ₦522,300 to construct 49.56 hectares fish ponds. This gave an average estimated cost of ₦10,540 per hectare of fish pond. Costs ranged between ₦2,500 and over ₦20,000 per hectare (Table 1).

Table 1 - Pond construction costs in Anambra State based on fish farmers' responses, 1985

Cost Range (₦)	Number of Farmers (Frequency)	Percentage (% Frequency)
1,000 - 4,999.99	6	25.00
4,999.99 - 9,999.99	7	29.20
10,000 - 14,999.99	5	20.80
15,000 - 19,999.99	4	16.70
20,000 and above	2	8.30
Total	24	100.00

d) Vegetation

Clearing of heavily wooded land as well as stumping the site for pond construction can add more to the cost of constructing the fish ponds. Thus, fisheries enterprises located on relatively rolling land with good watershed is ideal. Results of the survey showed that clearing costs ranged from ₦155 to ₦3,000 per hectare (Table 2).

Table 2 - Land Clearing Costs based on fish farmers' responses in Anambra State, 1985

Cost Range (₦)	Number of Farmers (Frequency)	Percentage (Per cent Frequency)
100 - 499.99	9	37.50
500 - 999.99	11	45.80
1,000 - 1,499.99	2	8.30
1,500 - 1,999.99	1	4.20
2,000 - 2,499.99	-	-
2,500 - 2,999.99	1	4.20
3,000 and above	-	-
Total	24	100.00

Source: Field Survey, 1985

e) Fish Seed and Stocking Rate

Almost all the fish farmers interviewed in Anambra State stated that stocking rate is dependent on the quantity of fish seed supplied for the production activity. This they said was due to the irregular availability of fish seeds in the State. Hence, the quantity and quality of fish fingerlings available at the time of stocking dictates the stocking rate. There were only two fish farms in the State during the survey exercise noted for fish seed production. It was estimated that only 30,000 fingerlings were available as compared to the estimated demand for 200,000 fingerlings. Most of the farmers had plans to start producing their own fingerlings in order to remove the economic hardship created by the insufficient production of fish seeds to satisfy farmers needs.

f) Feed and Feeding

Fish farmers in Anambra State use a variety of feeds such as groundnut cake, palm kernel cake, rice bran, brewer's waste and cassava but the two most frquently used feed, fed to the fishes are palm kernel cake and rice bran.

g) Liming and Pond Fertilization

All the farmers interviewed stated that they lime and fertilize their ponds. They used organic fertilizers such as poultry waste, pig dung and compost or inorganic fertilzers (NPK). The organic fertilizers are applied at the rate of 160kg per hectare while the inorganic fertilziers are applied at the rate of 100kg per hectare per month.

h) Fish Species Cultured

Four types of fish species were named and these are: tilapia, catfish, common carp and Heterotis. The two most commonly cultured are tilapia and catfish.

i) Harvesting and Marketing

The survey results showed that most of the fish farmers harvest their fishes once or at most twice a year. The harvested fishes are sold directly to the public or accredited agents at the pond sites. They indicated that they have no problems marketing their fishes as there are more fish retailers and distributors than producers. The price range of fish sold was between ₦2.50 and ₦4.00 per kg depending on the species.

Preparation of Enterprise Budgets

An enterprise budget is a static image of a certain farm activity (Engle, 1985). It is static in the sense that it analysis the activity at a given point in time rather than over the whole productive life of the activity. Positive net returns is always an indication of profitability in an enterprise budget (Crawford and McCoy, 1977). Tables 3, 4 and 5 summarized budgets for 1-, 5- and 10- hectares of fish pond cultured using tilapia, carp and catfish in a polyculture system.

As shown by the budgets, fish farming is economically feasible in Anambra State given that capital (liquid assets), management, labour and all the necessary inputs are available at the right time. Hence, in terms of protein production, the increase in fish available for home consumption in Anambra State can contribute significatly to the stabilization in other food crop production and this can be perceived by the fish farmers as important benefits to the farmers in Anambra State in general.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

As of February 1985, there were approximately 24 active fish farmers in Anambra State, Nigeria. In addition, there was a viable State Pilot Fish Farm in operation. Total land under utilization was 52 hectares with an estimated output of 33 metric tonnes.

Most of the fish farms were sited near rivers and streams for easy assess to water supply needed for year-round fish production. The State has potentials for commercial fish farming operations.

It was reported by the farmers interviewed that the fisheries experts engaged by the Federal, State or Local Government agencies were actively involved in the State's developmental programme.

The enterprise budgets developed from the survey showed that fish farming can be a lucrative business all things being equal.

It is therefore, recommended that prospective fish farmers should as a rule carry out an economic analysis of any proposed fish farming operation before embarking on the activity. The budget can be prepared along the lines demonstrated in this study to allow the farmer interprete his own plans in financial terms. A well prepared plan will serve as checks and balance for the farmer's activities especially if it is to be a commercial enterprise.

Major constraints identified from the survey were:-

- lack of capital for interested fish farm investors in the State
- dire scarcity of fingerlings, feed and experience fish farm managers for the commercial enterprises.
- lack of infrastructural facilities for a well developed marketing activity.

Future researches should include budgeting for intergrated systems such as Chicken-Fish Production, Hog-Chicken-Fish Production, Duck-Chicken-Fish Production, to name a few..

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Table 3 - Annual costs and returns for Tilapia-Carp-Catfish production for 1-hectare pond in Anambra State, 1985

Item		Total Value or Cost (₦)	Annual Depreciation (₦)
Annual Returns			
Tilapia		4,200.00	
Carp		4,725.00	
Catfish		4,550.00	
Sub-Total	=	13,475.00	
Costs			
A. Fixed: Pond construction			2,681.64
B. Operating:			
Fish seed: Tilapia		400.00	
Carp		450.00	
Catfish		450.00	
Lime		30.00	
Fertilizer		24.00	
Poultry waste		15.00	
Feed: Palm kernel cake		360.00	
Rice bran		270.00	
Labour Cost:			
Fertilizing, liming		200.00	
Periodic stocking		100.00	
Pond maintenance		100.00	
Harvesting		250.00	
Transportation		200.00	
Land rentage		50.00	
Nets			40.00
Management		1,500.00	
Miscellaneous		100.00	
Interest on operating capital at $8^{3}/_{4}$ %		397.16	
		7,617.80	
Annual Net Returns to Capital and Labour		5,857.20	

Table 4 - Annual Costs and returns for Tilapia-Carp-Catfish production for 5-hectares pond in Anambra State, 1985

Item	Total Value or Cost (₦)	Annual Depreciation
Annual Returns		
Tilapia	20,490.00	
Carp	21,245.00	
Catfish	21,437.50	
Sub-Total	63,172.50	
Costs		
A. Fixed: Pond construction		7,828.06
B. Operating:		
Fish seed - Tilapia	2,000.00	
Carp	2,250.00	
Catfish	2,250.00	
Lime	150.00	
Fertilizer	120.00	
Poultry waste	75.00	
Feed: Palm kernel cake	1,800.00	
Rice bran	1,350.00	
Labour Cost:		
Fertilizing, liming	450.00	
Periodic stocking	200.00	
Pond maintenance	250.00	
Harvesting	550.00	
Transportation	480.00	
Land rentage	250.00	
Nets		80.00
Management	2,400.00	
Miscellaneous	250.00	
Interest on Operating Capital at 8³/4%	1,282.31	
Sub-Total	16,187.31	
Annual Net Returns to Capital and Labour	39,157.13	

Table 5 - Annual costs and returns for Tilapia-Carp-Catfish production for 10-hectares pond in Anambra State, 1985

Item	Total Value or Cost (₦)	Depreciation (₦)
Annual Returns		
Tilapia	40,950.00	
Carp	43,960.00	
Catfish	43,400.00	
Sub-Total =	128,810.00	
Costs		
A. Fixed: Pond construction		15,656.11
B. Variable:		
Fish seed: Tilapia	4,000.00	
Carp	4,500.00	
Catfish	4,500.00	
Lime	300.00	
Fertilizer	240.00	
Poultry waste	150.00	
Feed: Palm kernel	3,600.00	
Rice bran	2,700.00	
Labour Cost:		
Fertilizing, liming	650.00	
Periodic stocking	250.00	
Pond maintenance	350.00	
Harvesting	800.00	
Transportation	600.00	
Land rentage	500.00	
Nets		120.00
Management	3,600.00	
Miscellaneous	400.00	
Interest on Operating Capital at 8³/4%	2,385.25	
Sub-Total	29,645.25	
Annual Net Returns to Capital and Labour	83,008.64	