

ECONOMICS OF COMMERCIAL FISH FARMING IN EARTHEN PONDS IN NIGERIA: PRIVATIZATION OF FISH FARMS.

F.C OKOYE AND J.O AYANDA.
*National Institute for Freshwater
Fisheries Research P.M.B. 6006, New Bussa
Niger State*

ABSTRACT.

The construction and management of a series of ponds for commercial freshwater fish production are discussed in details with the sole aim of making profit. The management is based on polyculture of Tilapia (*Oreochromis niloticus*) and catfishes (*Clarias gariepinus* and *Heterobranchus spp* and their hybrids)

Based on financial analysis of a five hectare commercial fish farm, a bank loan of N10,000,000,00 will be needed and within a pay back period of 2.3 years, a good return on investment will be realized. Government Commercial fish farms of this magnitude that are no longer run as a profitable venture are recommended for privatization. This will surely provide more employment, generate income and alleviate poverty, especially among the rural dwellers.

INTRODUCTION:

Nigerian has the long problem of protein deficiency. Aquaculture which started over 40 year ago was believed to bridge the gap between fish demand and supply but has not been able to substantially contribute to the domestic fish production. Nigeria is one of the largest fish importers, importing about 800, 000 MT of fish annually (Miller, 2003). This has a negative trade balance to the nation. Commercial aquaculture has been shown to be the only gate way to this trade in balance and it has been pointed out to be catalytic to food security, hunger reduction and poverty alleviation through economic growth and employment generation, particularly at a time when fish production from capture fisheries in Nigeria has reached its assured maximum sustainable yield.

The development of aquaculture in Nigeria, like most other countries in Africa, has been very slow for several reasons: lack of feeds and high quality

seed (fingerling), inadequate access to credit, conflict with other sectors, environmental degradation, poor experiences of past attempts at developing aquaculture, inadequate and inappropriate research on aspects of aquaculture and the lack of economic viability studies (FAO, 2001). There is also the need for serious research work on indigenous fish species as indiscriminate introduction of non-indigenous fish species can adversely affect biodiversity. The federal government (including states) has constructed many fish farms, fish hatcheries and feed mills most of which have been abandoned today due to ineffective management (Miller, 2003). These farms have never contributed significantly toward solving domestic fish production or solving the problems facing the private fish farmers in terms of fish fingerlings and fish feeds.

Fish is very much consumed by Nigerians

especially by rural dwellers. The country has a total fish consumption estimate of 1.3 million metric tons but produces about 450,000 metric tons. The deficit has to be made up through commercial aquaculture. The major initiation in improving commercial aquaculture is through the privatization of government owned fish farms and fingerling production centers, training of youth in aquaculture, joint-venture enterprise particularly for the production of shrimps, as well as the provision of credit facilities, training of aquaculture operators and adoption of less sophisticated techniques in fish seed production.

POINTERS IN THE ESTABLISHMENT OF COMMERCIAL FISH FARM:

Like any other agricultural commercial enterprise, pre-feasibility and feasibility studies are necessary for the establishment of commercial fish farm. Feasibility studies are normally conducted under the following guidelines:

(a) **Site selection and Land Acquisition-**

This is based on the availability of water and at times good quality soil. After these, one looks at the topography of the site. After these are established, one goes into land acquisition. This varies from one place to another and is influenced by the current land use and its relative usefulness to agriculture.

(b) **Site Survey and Farm Design-**

The acquired land has to be cleared and surveyed to provide basic data on the topography of the area for easy design of the farm. There is no hard and fast rule about the design but should be able to show the layout of the farm, position of the reservoir (if any), the ponds, dikes, or drainage systems, drainage canals and spill ways. A simple office complex is often very necessary. This should contain offices and stores for feed and other farm inputs. The cost of survey and design will vary

according to locality but should not exceed 5% of the total cost of pond construction.

(c) **Cost of Pond Construction.**

The volume of the earth to be excavated can be computed from the design and the desired depth of the ponds. Normally the depth of the pond should not exceed 1.5 meters. The cost of earth movement can be calculated using the current rate of hiring a bulldozer in the locality.

Market survey is necessary for other inputs. The cost of dike and monk construction is usually about 6% of the cost of the entire pond and the cost of grassing the crest and slope of the dikes is estimated at less than 0.5% of the cost of pond construction,

(d) **Preparation of Operational Plan**

This is necessary for commercial fish farms especially when financial firms are involved in loan acquisition. This shows the financial analysis, cash flow statement, production targets and loan repayment schedule.

ECONOMICS OF COMMERCIAL POND FISH CULTURE:

USING A 5-HECTARE FISH FARM AS A MODEL

The total estimated cost of establishing a 5 hectare fish farm on a 6 hectare land is shown in Table 1 as 9, 830,000.00. This is made up of fixed capital investment cost of 7,280,000.00 and operating expenses of 2,550,000.00. The operating cost increases gradually up to about 3,000,000.00 within the five years period. This is expected as inflation and running cost will surely increase with time. The cash flow statement over a period of five years is positive throughout as the market price of the cultured fish will continue to be attractive.

Table 2 shows the loan repayment schedule. The loan repayment in the first year is highest.

However, the loan will be paid easily within the five year period. Table 3 shows the depreciation value of the fixed assets some of which will last for over fifty years.

Table 4 shows the projected profit and loss account. The net profit increases gradually from the first year to the fifth year. Table 5 shows the economic indicators. The Net Profit value (NPV) is estimated at 4,212,279.00 while the pay back period is estimated to be 2.32 years. The internal rate of return is estimated at 20%.

CONCLUSION:

The project has shown to be viable. Finance houses are therefore encouraged to support fish farming aggressively for rural development.

However the bank interest rate, especially for commercial banks is very high and should be looked into so that the venture could be more lucrative.

From the above analysis, it is obvious that fish farming could be run as a gainful venture. Government farms should be made to be productive and if possible run as a profitable venture. Those farms that fall short of expectation should be privatized so that they could be used to alleviate poverty especially in the rural areas. If such is to be done, the fishery officers within the zone of the fish farms should be given the option of running them or buying them under a special programme whereby commercial houses should come to their aid.

REFERENCES

FAO (2001) Report of the eleventh session of the committee for Inland Fisheries of Africa. Abuja, Nigeria, 24 27 October 2000. Nigeria, 24 27 October 2000.
FAO Fisheries Report NO. 644. RAF1/R644 (Bi)

MILLER .J. (2003) Integrated Irrigation Aquaculture Opportunities in Nigeria. "The special Programme for Food Security and Rice Fish Farming in Nigeria". Document presented at the FAO Regional Integrated Irrigation Aquaculture Conference in Bamako, Mali. 4 7 Nov. 2003.

TABLE 1:

HECTARE FISH FARM FINANCIAL ANALYSIS FOR THE DEVELOPMENT OF A S CASH FLOW STATEMENT

Particulars	Period (Years)					000
	1	2	3	4	5	
A. CASH RECEIPTS						
1. Sale of Table size 2700 Tilapia		2160.	2160	2520		2520
2. Sale of Catfish 5500		4,400.	4400	5280		5280
3. Bank loan		10,000	-			
Subtotal	16,560.	6560	7800.	7800		8200

B. CASH PAYMENT**(Fixed capital)**

1. Land Acquisition	180	-	-	-	-
2. Survey/Design	120	-	-	-	-
3. Clearing	60	-	-	-	-
4. Pond Dev.	5000	-	-	-	-
5. Farm house	1120	-	-	-	-
6. Farm Equipment	800	-	-	-	-

Subtotal 7280

C. OPERATING COST (RECURRENT INPUT)**1. Fingerlings:**

Tilapia – 50,000	150	150	150	150	150
@ 3.00					

Catfish – 25,000	750	750	750	750	750
@30.00					

2. Personnel	820	820	880	960	960
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3. Feeds/Fertilizer	400	420	440	460	480
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4. Vehicle/Pump

Running cost	200	240	280	320	360
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5. Miscellaneous	230	200	220	220	230
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Subtotal 2550 2580 2720 2860 2930

D. LOAN REPAYMENT**PLUS INTEREST**

3%	5,000	4400	3800	3200	2600
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E. TOTAL CASH OUTFLOW

(B + C + D)	14830	6980	6520	6060	5530
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F. TOTAL CASH INFLOW

(A - E)	1730	(420)	280	1740	2770
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TABLE 2 LOAN REPAYMENT SCHEDULE

YEAR	PRINCIPAL	INTEREST	ANNUAL	OUTSTANDING
	AT 30%		REPAYMENT	BALANCE
	N	N	N	N
0	-	-	-	10,000.000
1	2000 000	3000 000	5000 000	8000 000
2.	2000 000	2400 000	4400 000	6000 000
3.	2000 000	1800 000	3800 000	4000 000
4.	2000 000	1200 000	3200 000	2000 000
5.	2000 000	6000 000	2600 000	-

TABLE 3 DEPRECIATION TABLE FOR CAPITAL ITEMS

Year Depreciation value at 10% capital

0	-	-	7,280,000
1	728,000		6,552,000
2.	6,55,200		5,896,800
3.	589,680		5,307,120
4.	530712		4,776,408
5.	477641		4,298,467

TABLE 4 PROJECTED PROFIT AND LOSS ACCOUNT

PARTICULARS	PERIOD (YEAR)				
	1	2	3	4	5
Revenue form fish sale	65 60 000	65 60 000	7800 000	7800 000	8200 000
Less Operating cost	25 50 000	25 80 000	2720 000	2560 000	2930 000
Operating Profit	4010 000	4980 000	5080 000	4940 000	5270 000
Less Depreciation	728000	655 200	589 680	530 712	477 641
Gross Profit	328 2000	432 4800	4490 320	440 9288	4792 359
Less interest on loan 1 at 30%	3000 000	2400 00	1800 000	1200 000	600 000
Profit before tax	282000	1924800	2690320	3289288	4192359
Less company task at 45%	126,900	866160	1210644	1480180	1886562
Net Profit	155100	1058,640	1479676	1809108	2305797

TABLE 5 ECONOMIC INDICATORS

Year	INCOME		EXPENDITURE		BENEFIT	
	Actual	Discounted value at 30%	Actual	Discounted value at 30%	Actual	Discounted value at 30%
0	-		-7280 000	-7280 000	-7280 000	-7280 000
1.	6560 000	5045952	2550 000	1961 460	4010 000	3084 492
2.	6560 00	3881552	2580 000	1526 586	4980 000	2946 666
3.	7800 000	3550 560	2720 000	1238 144	5080 000	2312 416
4.	7800 000	2730 780	7860 000	1001286	4940 000	1729 494
5.	8200 000	2208 260	2930 000	789 049	5270 000	1419 211

NPV = 4,212,279

IRR = 20%

Payback period = 2.32 years.

