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Economics of Catfish Production in Akwa Ibom State, Nigeria

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Abstract- The study examined the economics of catfish production in Akwa Ibom State, Nigeria. Data for the study were obtained from 120 catfish farmers in Akwa Ibom State using multi-stage sampling procedure, and analyzed using descriptive statistics and budgeting technique. Results show that 36.7% of the respondents were aged between 41-50 years with 85.8% being married and 80% having formal education. The costs and returns analysis indicates that the fixed cost constituted 65.37% of the total cost of production while the variable cost constituted 34.63%. The total cost of catfish production was N37, 845,240.00; the total revenue was N56, 385,000.00 and the net income was N18, 539,760.00 indicating that catfish production was profitable in the study area. Findings also reveal that high cost of feeds, high cost of pond construction and lack of capital/finance were the most severe constraints to catfish farming in Akwa Ibom State, Nigeria. It is recommended that prices of feeds and access to feeds be regulated by the State Government in order to reduce the problems of high cost of feeds/inadequate supply of feeds to catfish farmers in the State.

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I. Introduction

Nigeria is predominantly an agrarian country, where the greatest percentage of the population is engaged in farming, and Nigerian Agriculture contributes about one-third of the Gross Domestic Product (GDP) of the nation (Amao et al, 2009). The average contribution of the fishery sector to the agricultural GDP of Nigeria rose from 2.6% in 1980 to 3.7% in 1990, and was estimated at about 4% for the year 1994. The fishery sub-sector provides full-time employment to over 12 million people, which constitutes about 3% of the active population of the nation; another 11 million people indirectly earn their livelihoods from activities related to fisheries (Food and Agriculture, FAO, 1999). Fish farming generates employment directly and indirectly in terms of people employed in the production of fishing output and other allied businesses (Olagunjun et al, 2007). Fish is the most important animal protein food available in the tropics (Ali et al, 2008). It provides about 40% of the dietary intake of animal protein of the average Nigerian (Federal Department of Fisheries, FDF, 1997). Apart from human consumption, fish is important for anima l feed, a source of raw materials in allied industries and a source of employment for many Nigerians (Esu et al, 2009).

The most commonly cultured species of fish in Nigeria include catfish, tilapia and carp (Olagunju et al, 2007). However, many fish farmers in Nigeria focus on catfish because it adapts well to culture environment, can easily be retailed live and it attracts premium price. Catfish are suitable for stocking in ponds and they tolerate low dissolved oxygen better than other common species in the country. Besides, catfish has wide acceptability as food in Nigeria. Despite these considerably high potentials, local fish production has failed to meet the country's domestic demand (FAO, 1995). This has led to the existence of a demand-supply gap of at least 0.7 million metric tones in Nigeria. Increased catfish production in the country, according to FAO (1998), can help reduce this worrisome demand-supply fish gap in the nation. Ugwumba and Chukwuji (2010) posited that greater improvement in catfish production can be achieved with a proper analysis that will lead to knowledge of the level of profitability of catfish farming and constraints to production. This study therefore examined the economics of catfish production in Akwa Ibom State, Nigeria. Specially, the objectives were to examine the socio-economic characteristics of catfish farmers in the State, determine the profitability of catfish production and ascertain the constraints of catfish farming in the study area.

II. Methodology

The study was conducted in Akwa Ibom State. The State lies between latitude 4°31" and 5°31" North and longitude 7°35" and 8°35" East; occupies a total land area of 7, 254, 935 km2 and has an estimated population of 3, 920, 208 (National Population Commission, NPC, 2006). Multi-stage sampling procedure was used to select the sample for the study. The first stage was a random selection of four zones out of the six Agricultural Development Project (ADP) zones in Akwa Ibom State, Nigeria. The second stage involved the random selection of three villages in each of the selected ADP zone. The third stage was the purposive selection of ten catfish farmers who were registered with the Akwa Ibom State Agricultural Development Project (AKADEP) in each of the selected villages, resulting in a total sample size of 120

Data collection was through primary sources using a validated questionnaire. Data for the study were

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obtained from November 2010 to April 2011- the period of active fishing and marketing activities in the State. Analysis of data was done using descriptive statistics (such as frequency counts, percentages, means and ranks) and the budgeting technique. The budgeting technique employed was the net farm income. The difference between the Gross Revenue (GR) and the Total Cost (TC) gives the Net Revenue (NR). Net farm income is expressed as:

NFI = GR – TC

Where:

NFI = Net farm income

TC = (TVC + TFC) = Px. X

GR = Gross Revenue = Py. Y

Py = Unit price of output

Y = Quantity of output

Px = Unit price of input

X = Quantity/Quality of input

TC = Total Cost (N)

TFC = Total Fixed Cost (N)

TVC = Total Variable Cost (N)

In order to ascertain the constraints to catfish farming faced by the respondents, 14 major constraints were identified through focus group discussions (FGDs), interviews and literature search. Respondents were requested to indicate the severity of each constraint item. This was done with the aid a 3-point Likert-type scale, with nominal values assigned to the points in the scale as follows: Not a Constraint = 0, Mild Constraint = 1, and Severe Constraint = 2. A mean score was computed for each constraint item, and the mean score was used to rank the constraints in order of severity.

III. Results and Discussion

Socio-economic characteristics: Table 1 shows the socio-economic characteristics of catfish farmers in Akwa Ibom State, Nigeria. The Table reveals that 72.0% of the respondents were males while 20.8% were females. The findings agree with Esu et al (2009) who reported that fish production is dominated by males in Akwa Ibom State. About 35.8% of the respondents were within the age range of 31-40 years while those within the age range of 61-70 years constituted 0.8% of the respondents. The mean age of the respondents was 42 years implying that catfish production is a livelihood activity dominated by youths in the study area. About 25.0% of the respondents had primary education while 17.5% had acquired tertiary education. The Table reveals that majority (80.0%) of the respondents were functionally literate. Over eighty five percent of the respondents (85.8%) were married while only 0.8% were divorced/separated. Asa et al (2012) noted that marriage is a highly cherished social value among fish farmers in Akwa Ibom State and this finding corroborates that. About 45.0% of the respondents lived in household sizes of 4-6 persons while 2.5% of them lived in household sizes of 10-12 persons. The average household size of the respondents comprised of five persons. This suggests a relatively low household size among the respondents. Over fifty five percent (55.8%) of the respondents had 1-3 years of catfish farming experience while 5.8% had 10-12 years of fishing experience. The average years of experience in catfish farming by the respondents was four years. This is low, and may be attributed to the fact that commercial catfish production is a relatively new idea in the study area.

Majority of the respondents (64.2%) used concrete pond as their management system while 10.8% used both earthen and concrete ponds. The findings agree with Asa et al (2012) which stated that majority of fish farmers in Akwa Ibom State use concrete ponds for fish production. About 46.7% of the respondents depend on hired labour for their catfish production activities while 11.7% rely on family labour.

Table 1 : Socio-Economic Characteristic of Respondents

Variable	Category	Frequency	Percentage
Sex	Male	95	79.2
	Female	25	20.8
Age	21 – 30 years	14	11.7
	31 – 40 years	43	35.8
	41 – 50 years	44	36.7
	51 – 60 years	18	15.0
	61 – 70 years	1	0.8
Educational status	No formal education	24	20.0
	Primary education	30	25.0
	Secondary education	45	37.0
	Tertiary education	21	17.5
Marital status	Single	13	10.8
	Married	103	85.8
	Divorced/Separated	1	0.8
	Widowed	4	2.5

Household size	1 – 3 person(s)	28	23.5
	4 – 6 persons	54	45.0
	7 – 9 persons	35	29.2
	10 – 12 persons	3	2.5
Fishing experience	1 – 3 year(s)	67	55.8
	4 – 6 years	38	31.7
	7 – 9 years	8	6.7
	10 – 12 years	7	5.8
Management system	Earthern pond	30	25.0
	Concrete pond	77	64.2
	Both earthern and concrete pond	13	10.8
Type of labour	Family labour	14	11.7
	Hired labour	56	46.7
	Both family and hired labour	50	41.7

Profitability of catfish farming in Akwa Ibom State: The profitability of catfish production, ascertained using costs and returns analysis, is shown in Table 2. The Table reveals that fixed cost constituted 65.37% of the total cost of catfish production while the variable cost constituted 34.63%. The costs of concrete pond construction (27.99%), buildings/structures (19.77%), earthern pond construction (16.66%), and land (11.75%) were major fixed costs incurred by the respondents while the costs of management/staff salaries (25.12%) and feeds (24.60%) constituted the major variable costs. The total quantity of catfish sold by the respondents in the production period (2010/2011) was 62,650 and the average price per catfish at market prices in 2011 was N900.00. Table 2 indicates that the total cost of catfish production was N37, 845,240.00 and the total revenue of N56, 385,000.00 was realized from sales of catfish, making a net income of N18, 539,760.00. The costs and results analysis showed that catfish production is profitable in the study area. The findings agree with Asa et al (2012) who reported that fish production is profitable in Akwa Ibom State, Nigeria. Ohen and Abang (2009) also reported that catfish farming is profitable in Rivers State, Nigeria. Rivers State and Akwa Ibom State are in the same Niger Delta Region of Nigeria.

Table 2 : Costs and Returns of Catfish Production Akwa Ibom State

Item	Total cost for the production period (₦)	Average cost (₦)	Percentage
A. Fixed cost			
Land (ha)*	2, 907, 000. 00	24, 225.00	11.75
Water	1, 054, 050.00	8, 783.75	4.26
Concrete pond construction	6, 924, 000.00	57, 700. 00	27.99
Earthern pond construction	4, 121, 300.00	34, 344.16	16.66
Insurance/tax	1, 265, 650.00	10, 547.08	5.12
Facilities	1, 719, 000.00	14, 325.00	6.95
Wheel barrow	1, 857, 900.00	15, 482.50	7.51
Buildings/structures	4, 892, 000.00	40, 766.67	19.77
Total Fixed Cost (TFC)	24, 740, 900.00	206, 174.17	100
B. Variable Cost			
Labour (mandays)	205, 900.00	1, 715.83	1.57
Transportation	665, 900.00	5, 549.17	5.08
Feed (kg)	3, 224, 100.00	26, 867.50	24.60
Fingerlings (kg)	2, 098, 000.00	17, 485.00	16.01
Cost of water	708, 200.00	5, 901.67	5.40
Management/staff salaries	3, 291, 500.00	27, 429.17	25.12
Storage	1, 126, 000.00	9, 383.33	8.59
Medication	1, 254, 300.00	10, 452.50	9.57
Maintenance	530, 240.00	4, 418.67	4.05
Total Variable Cost (TVC)	1 3, 104, 340.00	109, 202.83	100
Total Cost = TFC + TVC	37, 845, 240.00	315, 377.00	
C. Total Revenue (T			
Sales of catfish	56, 385, 000.00	469, 875.00	
D. Net farm income (NFI)			
NFI = TR – (TFC + TVC)	18, 539, 760.00	154, 498.00	

*Note: * = Cost of land is not depreciated as it is leased for only one production period; N = Naira (the Nigerian currency) and 1.00 Nigerian Naira is equal to 0.00609942 US Dollar as at April, 2014.*

Constraints to catfish farming in Akwa Ibom State: Table 3 shows the constraints to catfish production in the study area. The Table reveals that the most severe constraints to catfish farming in the State were: high cost of feeds (=1.52), high cost of pond construction (=1.73), lack of capital/finance (=1.62), erratic electric power supply (=1.58), and inadequate feeds supply (=1.52). The findings corroborate Ohen and Abang (2009) who reported that high cost of feeds is a major constraint to catfish farming in Nigeria. Ugwumba and Chukwuji (2010) posited that the importation of most commercial feeds into the country and the problems associated with importation and distribution could be the main reasons for the hike in feeds prices in the country. Catfish farming requires a huge capital outlay especially for pond construction, according to Ohen and Abang (2009), and the findings of the study agree with this position. Kudi et al (2008) reported that lack of capital is a major problem encountered in fish production in Nigeria, and the findings of this study agree with Kudi et al (2008). Erratic electric power supply is common in most states in Nigeria and this problem affects the rate of water supply to fish ponds in the study area. Hence, it is considered a major constraint to catfish production by the respondents since water is an important input in fish farming. Inadequate feeds supply, according to Assiah (1997), is a major problem of fish farming. The findings of this study corroborate Assiah (1997). The least severe constraints to catfish production in the study area, on the other hand, as revealed in Table 3 were: poor/unorganized market structure for catfish (=0.57), diseases (=0.51) and poor extension services on catfish production (=0.33).

Table 3 : Constraints to Catfish Farming in Akwa Ibom State, Nigeria

Constraint	Mean	Rank*
1. Lack of capital/finance	1.62	3
2. High cost of feeds	1.82	1
3. Diseases	0.51	13
4. Mortality of fish	0.73	11
5. Inadequate water supply	0.98	9
6. Inadequate feeds supply	1.52	5
7. Lack of quality fingerlings	1.03	8
8. High cost of transportation	1.25	6
9. High cost of pond construction	1.73	2
10. High cost of labour	0.82	10
11. Erratic electric power supply	1.58	4
12. Lack of modern technologies	1.21	7
13. Poor extension services on catfish Production	0.33	14
14. Poor/unorganized market structure for catfish	0.57	12

Note: = Rank 1 is considered the most severe constraint to catfish production while rank 14 is the least severe constraint

IV. Conclusion and Recommendations

The total revenue realized from total cost of catfish production in Akwa Ibom State, Nigeria of N37,845, 200.00 was N56,385,000.00, making a net income of N18,537,760.00. Catfish farming in the study area was therefore profitable. It is recommended that prices of feeds and access to feeds by catfish farmers be regulated by the State Government in order to ameliorate the problems of high cost of feeds/inadequate supply of feeds to catfish farmers in the State. The Government of Akwa Ibom State, Nigeria should also subsidize the cost of feeds in the State in order to reduce the cost of catfish production. This will encourage more farmers in the State to be engaged in commercial catfish production. Catfish farmers should be encouraged to form viable co-operatives to help them easily access low interest loans from the Government, banks and other development agencies in the State who prefer giving such loans/assistance to co-operatives/associations of farmers instead of individual farmers.

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