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## ANALYSIS OF PROFITABILITY OF CATFISH PRODUCTION IN IBADAN METROPOLIS, OYO STATE, NIGERIA

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### ABSTRACT

Profit is an essential part of a business. It is a measure of success of a business that is determine at the end of production cycle. That is the reason many fish farmers are disappointed with little or no profit from catfish farming. But this does not negate the fact that the business is profitable. Therefore, the profitability of catfish farming business is analyzed investigated in this study. Structured questionnaire were designed and randomly administered among 150 catfish farmers in three selected local government areas in Ibadan Metropolis. The result shows that average total cost was ₦792,696.13 while the average total revenue was ₦1,382,700.00. The gross margin (GM) was ₦645,076.64 and average profit (net returns) earned from the enterprise was ₦590,003.81. The expense structure ratio (ESR) is 0.07; benefit cost ratio (BCR) value was 1.74 and the gross ratio (GR) was 0.57. Therefore, the results obtained in this showed that catfish farming is a profitable business. However, catfish farmers should reduce their cost of production and ensure efficient use of input resources especially feeds

**Keywords:** Profitability, catfish, biological, financial, marketing

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### Introduction

The objective of commercial fish farming is to produce fish to markets at a competitive price and make profit. Profit is the motivation and engine that drives any enterprise (Ajagbe, 2018). It is the life of a business. Profit is the positive margin or difference between the economic or monetary value of input resources and output goods and services. Fish farming business has short turnover period (maximum of six months) and it is highly profitable (Mohammed *et al.* 2015; Alawode and Jinad, 2014; Olasunkanmi, 2012). Every individual entrepreneur will want to invest in a viable and profitable enterprise. Small-scale aquaculture enterprise, like any other small-scale enterprise, is fragile and can be short-lived with lack of profit. Therefore, efficient use of farm resources is very important because

efficient management of farm resources can make a difference between profit and loss in the business (Engle, 2010).

Majority of fish farming businesses in Nigeria can be classified as small-scale enterprises and sole proprietorships. This is in agreement with Engle and Stone (2014) definition of small-scale catfish production as a farm of fewer than 20 water acres. The analysis of small-scale fish farming business is divided into three major interdependent analyses; biological performance analysis, financial analysis and marketing analysis (Ajagbe, 2018). Among these three analyses, fish farmers focus mainly on the biological performance analysis of catfish production, while being less concerned about the financial and marketing analysis. Many individuals who wish to start fish farming business are captivated by the fish they wish to raise and will spend many



hours talking about their biology and growing requirements (Engle, 2010). Farmers put more premiums on biological analysis to the extent of attending seminars, training and workshops to update their knowledge on how to be good catfish farmers.

But, little did the catfish farmers know that the aggregated success in each of the mentioned categories of analysis is the profit expected. Failure in any of the three can make a great loss to the business. Engle and Stone (1997) explained that decisions regarding species, harvest size, or volume should be based on a comprehensive and specific market analysis for the fish business. Small-scale catfish producers especially, should carefully analyze market opportunities before beginning to produce fish. Likewise, careful financial management is very important for the success of catfish farming, it should be integrated catfish farming decision making (Engle, 2012). This will show the viability, profitability and liquidity of the business. Therefore, all these three analyses are equally important without any prejudice. None of them can stand alone to make a profitable venture, they must be worked together to make a good success of the enterprise.

Farm management involves more than just taking care of the biological processes involved; it includes paying close attention to the economic and financial analysis of the farm business. Catfish farming is capital intensive and thus requires big capital investment for reasonable profit to be made (Adebayo and Daramola, 2013). Financial analyses and management should be integrated into an overall business plan to provide the best guidance for farm decision making (Engle, 2010; 2012). Hanko and Polman (2003) confirmed that among the specific challenges need to be addressed in

any business venture including small-scale aquaculture, are management skills, accounting skills and marketing skills. It is rational for a fish farm manager or an investor to ask if the business will be profitable.

Profitability is the positive difference between the total revenue and total cost. Profitability of a business can be analyzed using by either of enterprise budgets and income statements. But income statements (profit and loss statements) are more suitable. A profit and loss statement has a bottom-line that indicates net farm income. The items use in profit and loss statement to analyze profitability includes business revenues, total variable costs or cash expenses and non-cash expenses such as depreciation for a production cycle. A positive value of net farm income indicates a profit while a negative value of net farm income indicates that fish production cycle is at lost (Engle, 2012). A series of financial ratios or analysis can be done from income statement. These include expense Structure ratio (ESR), benefit cost ratio (BCR), gross ratio (GR) and rate of return (ROR).

There are many challenges or risks that can limit the potential profitability of catfish farming business. High feed cost, flooding, poaching, diseases and marketing are some of the challenges that can limit farmers' expected profit (Tavares-Dias and Martins 2017; Kimathi *et al.* 2013; Olayiwola 2013). Many catfish farmers that start the business with high sense of positive expectation were disappointed with little or no profit because of challenges and risks involved. Non-profitability of individual catfish farmer does not negate the fact that the business is highly profitable as stated earlier. Therefore, there is need to evaluate and analyze profitability of catfish business among population of catfish farmers.



## Materials and Methods

### The Study Area

This study is carried out in Ibadan Metropolis of Oyo State, south-west Nigeria. It is the capital city of Oyo State. With a population of over 3 million, it is the third most populous city in Nigeria after Lagos and Kano; it is the country's largest city by geographical area. Ibadan metropolis has eleven Local Government Areas (World Population Review 2019).

### Sampling Procedure and Sampling Population

Small-scale fish farmers are widely distributed in Ibadan Metropolis. But the population of the study constitutes all small-scale fish farmers in Ibadan Metropolis, Oyo State. Purposive sampling technique was used in selection of respondents from three Local Areas with high population of fish farmers in Ibadan Metropolis. The selected Local Government Areas are Ido, Lagelu and Oluyole. In each selected Local Government Areas, four catfish farmer settlements were selected randomly. In Ido Local Government, the selected settlements

were *Aba* teacher, *Ido*, *Owode* and *Zartech* area. In Lagelu Local Government, the selected settlements were *Wofun*, *Olodo*, *Iyana-Church* and *Erunmu*. In Oluyole Local Government, the selected settlements were *Podo*, *Aba Onila*, *New Adeoyo Hospital* area (Fodasis College) and *Akala* way. The population of catfish farmers was not uniform in all the fish farm settlements; all four selected fish farm settlements in each LGA were taken as a unit. Therefore, 50 small-scale catfish farmers were randomly selected from each of the three selected Local Government Areas making 150 small-scale fish farmers were selected for this study.

### Analysis of Profitability

Income statement was prepared from the data collected from the questionnaire. Cost and returns analysis were used to determine the profitability of catfish production. The profitability analyses that were employed were Fixed cost (FC), Variable cost (VC), Total cost (TC), Total revenue (TR), Gross margin (GM) and profit. The farmer's profit is equal to total revenue (TR) minus total cost (TC) (Adebayo *et al.*, 2013)

$$\begin{aligned} \text{TC} &= \text{TVC} + \text{TFC} && (1) \\ \text{TR} &= \text{P} \times \text{Q} \text{ (P = Price and Q = Total output (kg))} && (2) \\ \text{GM} &= \text{TR} - \text{TVC} && (3) \\ \text{Profit} &= \text{GM} - \text{TFC} && \text{OR} && (4) \\ \text{Profit} &= \text{TR} - \text{TC} && && (5) \end{aligned}$$

In addition to the above illustrations, the profitability can also be determined with the use of ratio analysis such as:

$$\begin{aligned} \text{Expense Structure ratio} &= \text{Fixed cost/Total cost} && (6) \\ \text{Benefit cost ratio (BCR)} &= \text{Total revenue/ Total cost} && (7) \\ \text{Gross ratio} &= \text{Total Cost/ Total revenue} && (8) \\ \text{Rate of Return} &= \text{Net return/ Total cost} && (9) \end{aligned}$$



## Results and Discussion

Table 1 shows that the ages of the catfish farmers were between 28 and 67 years, from which 16.2% of catfish farmers were less than 30 years old; 27.7% were between the ages of 31 and 40 years; 41.9% were between the ages of 41 and 50 years while 14.2% of the catfish farmers were above 50 years old. From the analysis, 85.8% of catfish farmers were 50 years old and below with a mean age of  $44 \pm 1.65$  years. The implication of this is that majority of the population were in their prime age. This result corroborates the findings of Alawode and Jinaid (2014); Asa and Obinaju (2014); Akegbejo-Samsons and Adeoye (2012) and Awoyemi and Ajiboye (2011),

The results show that 88.5% of the catfish farmers were male while 11.5% were female. The implication of this is that male fish farmers are predominant in the study areas. This could be as a result of perception some people have about fish farming. Fish farming, especially pond management, is labour intensive and required some special skills. Women are involved in fish farming but are more concerned about marketing the products. Alawode *et al.* (2016), Asa and Obinaju (2014); Adebayo and Daramola (2013) and Ideba *et al.* (2013) also confirmed participation of more men than women in catfish farming.

Results show that 9.5% of fish farmers in the study areas were singles while 90.5% were married. This implies that majority of the fish farmers in the study area were married; an indication that fish farming enterprise is a viable business that can sustain family livelihood. Likewise, the result shows that the household size of fish farmers in the study areas was between 1 and 4. This shows the effect of family planning education on the fish farmers in the study area. This result is in agreement with the findings of Asa and Obinaju (2014), Adebayo and Daramola (2013); Awoyemi and Ajiboye (2011) and Adewuyi *et al.* (2010).

Results show that 5.4% of the respondents had no formal education, 16.2% had primary school education, 45.3% had secondary education while 33.1% had tertiary education. This shows that majority of catfish farmers in the study areas were literate. This is in corroborates the works of Alawode and Jinad (2014), and Ideba *et al.* (2013), who found that all (100%) of fish farmers were literate. The result shows that 65.5% of the catfish farmers were trained as catfish farmers while 34.5% of the respondents were not trained. But Awoyemi and Ajiboye (2011) recorded 45.2% women were trained as catfish farmers in Osun State.

**Table 1: Socio-economic Characteristics of Catfish Farmers**

Variables	Frequency	Percentages (%)
<b>Age Group</b>		
= 30	24	16.2
31 – 40	41	27.7
41 – 50	62	41.9
= 51	21	14.2
Mean: $44 \pm 1.25$		
Min: 28		
Max: 67		
<b>Sex</b>		
Male	131	88.5
Female	17	11.5



<b>Marital Status</b>		
Single	14	9.5
Married	134	90.5
<b>Household Size</b>		
1 – 4	148	100
<b>Level of Education</b>		
No formal education	8	5.4
Primary	24	16.2
Secondary	67	45.3
Tertiary	49	33.1
<b>Trained as fish farmer</b>		
Yes	97	65.5
No	51	34.5

Table 2 shows that the average total variable cost (TVC) that include cost of fish seed (fingerlings and juvenile catfish) stocked in the ponds, cost of feed, wages of labour, cost of medications, chemicals, pond maintenance and fuel is ₦737,623.36. Average total fixed cost (TFC) which includes cost of pond rented for the production, water source, scales, pipes and pumping machine is ₦55,072.77. Therefore, average total cost, which is the sum of average total variable cost and average total fixed cost per production cycle, is ₦792,696.13. The average total revenue generated from the sales of table size catfish in the study area is ₦1,382,700.00, the gross margin (GM) is ₦645,076.64 and average profit (net returns) earned from the enterprise is ₦590,003.81. This result corroborates with the findings of Adebayo and Daramola (2013).

The analysis of profitability ratios in Table 2 shows that expense structure ratio (ESR) is 0.07. This means that fixed cost accounted for 7% of the production total cost. Adebayo and Daramola (2013) reported ESR of 0.439. This implies that most of the input resources used for catfish production in the study area were variable resources that increase with increase in production. This would definitely increase

the revenue leaving fixed cost unchanged. The fish farmers rented most of the equipment or the materials used for catfish production.

The benefit cost ratio (BCR) value was 1.74. This implies that small-scale catfish enterprise is highly profitable in the study area and it is worth venturing into. The value of 1.74 simply means that every ₦1.00 invested in catfish enterprise will yield ₦0.74. Also, Alawode *et al.* (2016) reported BCR of 1.66 that indicated that catfish farming is profitable and feasible. Adebayo and Daramola (2013) reported a BCR of 1.62; Tunde *et al.* (2015) reported BCR of 1.9 while Akegbejo-Samsons and Adeoye (2012) reported BCR that was just greater than one.

The gross ratio (GR) was 0.57. This implies that from every ₦1.00 return to the enterprise, 57k is being spent. The simple rate of return is 0.74 or 74%. This shows that for every ₦1.00 invested, ₦0.74 is gained by the respondents. But, Adebayo and Daramola (2013) reported GR value of 0.619 and BCR value of 1.62 which shows a little difference from what was obtained from this study. Therefore, the result obtained in this study is in agreement with the works of Emokaro *et al.* (2010),



Alawode and Jinad, (2014) and Asa and Obinaju (2014), Issa *et al.* (2014) showing that catfish production is profitable.

**Table 2: Profitability Analysis of Catfish Farming Enterprise**

Items	Average Cost (₦)
Total Revenue (TR)	1,382,700.00
<b>Total Variable Cost (TVC):</b>	
Fish seed (Fingerlings and Juvenile), feeds, labour, chemicals, medication, maintenance and fuel	737,623.36
<b>Total Fixed Cost (TFC):</b>	
Ponds (Rented/Own), Water source, Scales, pipes, pumping machines	55,072.77
<b>Total Cost:</b>	
TFC + TVC	792,696.13
Gross Margin (TR - TVC)	645,076.64
Profit (TR - TC)	590,003.87
ESR	0.07
BCR	1.74
GR	0.57
ROR	0.74

Note: **ESR** – Expense Structure Ratio **BCR** – Benefit Cost Ratio **GR** – Gross Ratio **ROR** – Rate of Return

### Conclusion and Recommendations

The results obtained in this study re-emphasized that fish farming is a profitable and a viable enterprise. In catfish production, profit is the cumulative end result. Farmers must be conscious that profit in fish farming is achieved daily and increasing daily throughout the period of production. Therefore, to increase profitability of fish farming business, farmers must ensure that they keep their cost of production as low as possible. Also, they should ensure efficient use of input resources especially feeds.

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