Profit Analysis of Fish Farming Enterprises in Ikenne Local Government Area of Ogun State, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Author AOJ designed the study, performed the statistical analysis and wrote the first draft. Authors AOE, CGO and NOLC sourced and managed the literature searches. Authors SB and AOA went to the field for data collection, while Author ABTA interpreted and managed the analyzed data of the study. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Understanding the role of fish culture enterprises in our economy is critical for designing agricultural policies to increase productivity and enhance economic growth and to reduce poverty. The research investigated profit analysis of culture fish enterprises in Ikenne Local Area of Ogun State, Nigeria. This was achieved through random selection of 100 respondents. The method of analysis

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used was descriptive analysis to determine the socio economic characteristics of the fish farmers; budgetary analysis and profitability ratios was applied to examine profit level of the fish farmers. The results showed that 46% were men and 54% were women. Majority of the respondents (52%) were married and 48% were in the single category. It also revealed that farmers had at least primary education. 62% of the respondents had about less than 5 years experiences in the business, majority of farmers started their business with their own personal savings. The budgetary analysis shows that the gross margin of N50, 153,780 (125,384.45. Dollars) of the farmers and a net farm income of N49, 632, 580 (124,081.45. Dollars) of the respondents, which indicates that fish farming is profitable to the farmers in the study area. It was concluded that the venture is profitable to farmers, and it was recommended that young people mostly male should be encouraged to practice fish farming, and also involve in carrying out research on fish farming as this may help in solving the problem of food security and food sufficiency.

1. INTRODUCTION

Fish farming is an age long livelihood practice in the world. Although fish culture has long existed in Africa, it first started in Nigeria in 1942 [1]. Nigeria with a long coastline of 853/Kilometres has wide potential for fishery enterprise [2]. Nigeria has a strong fish culture supported by natural catch, which accounted for less than 20% of fish supply in Nigeria in 2007 [3]. follow this pattern with all references.

Fisheries occupy a unique position in the agricultural sector of the Nigerian economy. In terms of Gross Domestic Product (GDP), the fishery sub-sector has recorded the fastest growth rate in agriculture to the GDP. The contribution of the fishery sub-sector to GDP at 2001 current factor cost rose from N 76.76 billion to N 162.61 billion in 2005 [4]. Fish constitutes about 41% of the total animal protein intake by average Nigerian hence there is great demand for fish in the country. According to [5], Nigeria requires about 2.66 million metric tons of fish annually to satisfy the dietary requirement of its citizens (150 million). Nigeria has to import about 0.7 million tons of fish valued at about $500 million annually to argument the shortfall. This massive importation of frozen fish in the country has ranked Nigeria the largest importer of frozen fish in African [6]. It is projected that the per capital consumption of fish would be 13.5 kg from 2010 to 2015, while projected demand for fish would have increase from 1,430,000 tons in 2000 to 2,175,000 tons in 2015,with supply gap deficit of 1,444,752 tons [6]. [7] opined that fish industry remains the most untapped investment potential in Nigeria.In Nigeria, aquaculture is predominantly an extensive land based system, practiced at subsistence levels in fresh waters [8]. Commercial farming has yet to become widespread [9]. The local supply consists of productions from the artisanal (85.5% - 89.5%), industrial (2.5% - 5%), and aquaculture (5.5% - 12.0%) sub-sectors [10]. However, it has been shown that Nigeria can substitutes fish importation with domestic production to create jobs, reduce poverty in rural and peri-urban areas where 70% of the population live and ease the balance of payment deficits ([10,11]). At present, most fish farmers operate small-scale farms ranging from homestead concrete ponds (25 – 40 meters) to small earthen ponds (0.02 - 0.2 hectares) [9]. With all these great potentials of fish, the small scale farmers who produce this fish still remain in poor state. Therefore, this work will concentrate on the following:

1. The socio-economic characteristics of the farmers
2. To ascertain the Profitability level of the venture in the study area
3. To identify the challenges faced by the fish farmers in the study area

2. MATERIALS AND METHODS

2.1 Study Area

The study was conducted in Ikenne Local Government Area (LGA) of Ogun State, which has its headquarter at Ikenne Remo. The Local Government Area is bounded 4 km to the East by Odogbolu Local Government Area (LGA), 5 km to the South by Ayepe, 10 km to the North east by Irolu, 4 km to the North by Ilara, 2 km to the East by Ilishan and 7 km to the West by Sagamu. The local government is located along the transitional forest zone of southern Nigeria and Guinea savannah. It is situated 235.2 meters above sea level, has an annual rainfall of 1200 mm, 65% mean relative humidity and 21.4° mean temperature. Fig. 1 shows the map of Ikenne local Government Area in Ogun state, Nigeria.
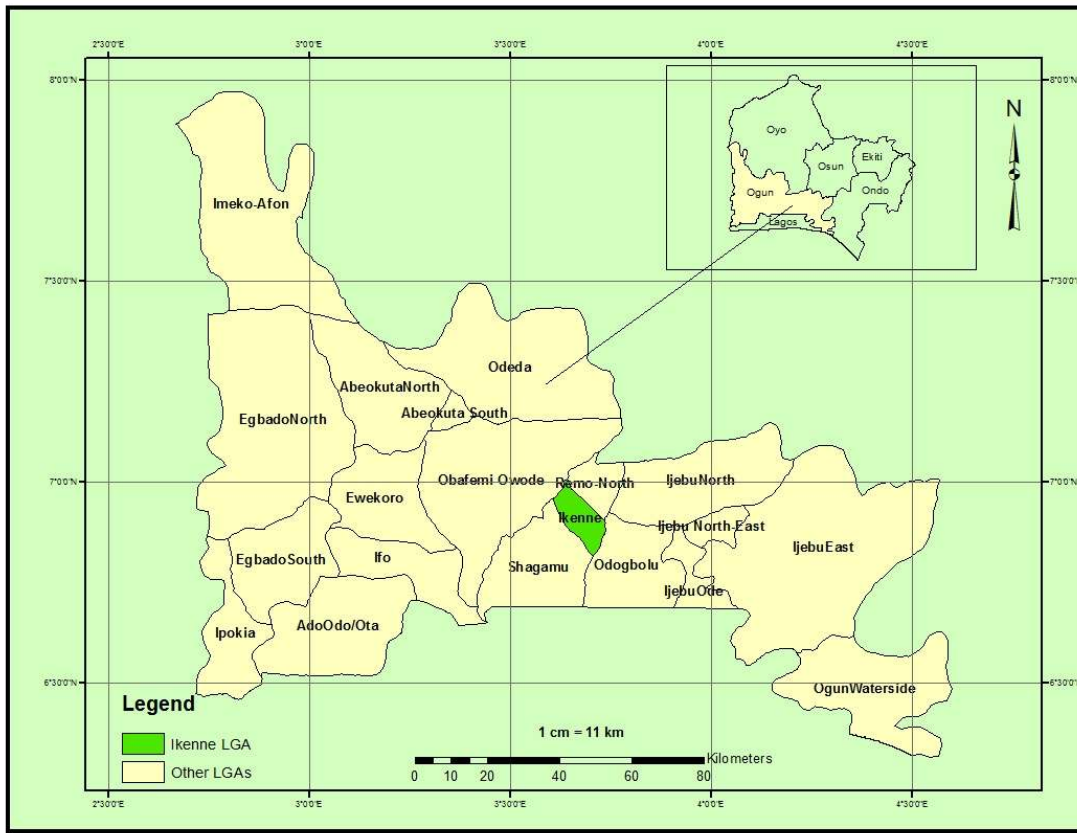
Fig. 1. Map of Ogun state showing Ikenne local Government Area

2.2 Sampling Procedure

Data for this study were mainly primary data which were collected with the aid of questionnaires applied to fish farmers in the study area. A two stage random sampling technique was adopted for this study. At the first stage five towns were randomly selected from the Local Government Area (LGA). The next stage of the sampling involved the random selection of 20 fish farmers from each of the selected towns in the Local Government Area (LGA), to give a total of 100 fish farmers which were used for the analysis.

2.3 Sources of Data

Cross sectional data, which was used in this paper were obtained through random sampling technique. Information sourced for include socioeconomic characteristics of the farmers, quantities and price of inputs used, and that of output.

2.4 Sampling Techniques

A two stage sampling techniques was employed in this study. First, purposive sampling procedure was adopted in the selection of Ikenne Local Government Area for the study. This is because of the predominant fish farming activities. A stratification of fish farmers was made from the list of registered farmers in the area. This was followed by the selection of 70% of the fish farmers in the list using a stratified random sampling. This account for a true representation of the population since they do not have equal numbers of farmers in the area.

2.5 Analytical Tool

Various analytical tools were used to achieve the objectives of the study. These include: descriptive statistics, and profitability ratio. Objective 1 was analysed using descriptive statistics such as mean and relative frequency. For objective 2 budgetary analysis was

employed. Objective 3 was analysed using descriptive statistics.

2.6 Profitability Ratios

Profitability ratio is a class of financial metrics that helps investors assess a business's ability to generate earning compared with its expenses and other relevant costs incurred during a specific period. Some examples of profitability ratios are listed and explained below:

Expense structure ratio (ESR) = FC/VC

Where, FC = Fixed cost and VC = Variable cost

Rate of Return on Capital Invested (RORCI) = π/TC

Where, π = Profit (TR - TC)

Gross Ratio (GR) = TFE/GI

Where, TFE = Total farm expenses and GI = Gross income, TC = Total Cost, TR = Total Revenue

3. RESULTS AND DISCUSSION

3.1 Gender of Respondents

Out of the respondents, 46.0% were male while 54.0% were female (Table 1.). This shows that women are more involved in fishery production in the study area, this is not in line with [12] who investigated gender analysis of culture fish enterprise in Epe local Area, Lagos State, Nigeria. This result shows that female are more involved in fishing activities than their male counterpart in the study area. This result may be adduced to the fact that there are more women than men in Ogun state [13].

Table 1. Distribution of farmers by gender

	Frequency	Percent
Male	46	46.0
Female	54	54.0
Total	100	100.0

3.2 Age of Respondents

Age is an important factor in traditional Agriculture. It determines farmer's productive ability and consequently his output. This is because farming is still labour intensive in this part of the world and traditional agriculture production system relying on rudiments implements powered by human muscle. Therefore, beyond certain age, farmer's productivity begins to decline. The Table 2. below shows the analysis of age, the modal age of the farmers was 31-40 years, which means that majority of the fishery farmers interviewed were in their middle age and some old. This has effect on productivity. [14] and [15] submitted that farming population is ageing thus reducing the effective labour force from agricultural productivity. Result shows that younger people who are supposed to be engaged in farming activities are not but rather they migrated to urban areas for non-farming occupation.

Table 2. Distribution of farmers by age

	Frequency	Percent
< 30 years	36	36.0
31 -40 years	55	55.0
41 - 50 years	9	9.0
Total	100	100.0

3.3 Marital Status of Respondents

This shows the number of dependents, which fishery farmers have to cater for as part of his responsibility. From the Table 3, majority of the sampled farmers were married (52.0%) while the singles were 40.0%, while others were 8.0% The result shows that most of the farmers interviewed have one or more people to cater for and who can also serve as source of family labour. This is in line with [15].

Table 3. Distribution of farmers by marital status

	Frequency	Percent
Single	40	40.0
Married	52	52.0
Others	8	8.0
Total	100	100.0

3.4 Household Size of Respondents

The average household size is between 2 and 4 which is slightly below national average which is about 4 - 5 [13].

3.5 Educational Status of Respondents

Table 5 shows that 18% of the no formal education, 25% of the respondents earned primary education, that of the secondary

education of the respondents was 34%. For Tertiary education was 23%. This implies that education plays a significant role in skill acquisition and knowledge transfer. It enhances technology adoption as well as the ability to plan and take risks. The distributions of the educational attainment of the respondents show that most of the fish farmers had secondary education as the highest educational attainment. This result is in conformity with [16] who asserted that educated fisher folks have greater likelihood to understand the working mechanism of the motorized engines and therefore should be able to use it more than the illiterate class of fisher folks.

Table 4. Distribution of farmers by household size

	Frequency	Percent
2-4	45	45.0
5-7	41	41.0
> 7	14	14.0
Total	100	100.0

Table 5. Distribution of farmers by educational status

	Frequency	Percent
NFE	18	18.0
Primary	25	25.0
Secondary	34	34.0
Tertiary	23	23.0
Total	100	100.0

3.6 Farming Experience of Respondents

The number of years of farming of fish farmers will determine how he will organized his resources in order to achieve level of production. [17] asserted that more experienced and educated farmers realize a high productive efficiency and this output. The years of farming experience of farmers affect the level of productivity and efficiency. Majority of the sampled framers have been in farming operation for a long time. Table 6 show that 62% of the respondents had less than 5 years of farming experience. About 18% of the farmers had been in the business for between 6 and 10, while 10% of the farmers had between 11 – 15 years of experience.

3.7 Distribution of Respondents According to Sources of Credit

Table 7 shows that majority of the respondents (56%) got their capital from personal savings to finance the business. 11.0% of the respondents reported that they received capital from informal sources (Money Lenders) This might be as a result of the bureaucracy in obtaining loan from the financial institutions or it could be as a result of high rate of interest which discouraged farmers. While a huge percent (20.0% and 13.0%) received loans from family and relatives, and from cooperatives respectively. Capital is very important because of its ability to engage or motivate other factors of production. It acts as a catalyst or elixir that activates the engine of growth, enables it to mobilize its inherent potentials and to advance in the planned or expected direction [18]. If farmers possess credit, he could overcome his destruction by applying credit to purchase needed equipment goods and services to attain a more efficient use. From the table, the lending sources of credit is personal savings because of these institutional source cannot be easily access by the farmers. Also, it shown from the table that as the sources of capital of the fishery farmers increases, their efficiency level also increases.

Table 6. Distribution of farmers by farming experience

	Frequency	Percent
< 5 years	62	62.0
6- 10 years	18	18.0
11-15 years	10	10.0
Total	100	100.0

Table 7. Distribution of farmers by source of credit

	Frequency	Percent
Personal savings	56	56.0
Bank Loan	11	11.0
Friends and Relatives	20	20.0
Cooperatives	13	13.0
Total	100	100.0

3.8 Farm Size

Farm size is a factor that affects the level of output. Nigeria agriculture is characterized by small farm holdings. Therefore small size invariably leads to small output. The table shows that majority of the farmers are involved in the cultivation of small and medium size farmland.

3.9 Pond Type

Table 9 shows that 60% of the respondents used concrete ponds for their business. This revealed

that the concrete type of pond is the most popular system used in the study area compared to the earthen pond which was used by 13% of respondents while 27% of the respondents used other types of pond like tanks and plank ponds. The use of concrete pond might be due to its convenience, easy to clean and manage, and ease of harvesting and draining [19].

Table 8. Distribution of farmers by farm size

	Frequency	Percent
Small	36	36.0
Medium	50	50.0
Large	14	14.0
Total	100	100.0

Table 9. Distribution of farmers by type of pond

	Frequency	Percent
Net cage	27	27.0
Concrete	60	60.0
Earthen	13	13.0
Total	100	100.0

Table 10 shows that majority (95%) of the farmers cultivated clarias specie commonly known as cat-fish, while only 5% of the farmers cultivated other tilapia. This finding is in line with [19]. The reason might be due to the species commands a large market, hence, most preferred and more income to fish farmers. It is tasty in whatever form prepared and has high nutritional values.

Table 10. Distribution of farmers by fish species cultivated

	Frequency	Percent
Clarias	95	95.0
Tilapia	5	5.0
Total	100	100.0

Table 11 shows that Majority of the farmers (45%) made use of imported feeds, 36% made use of locally made feed, while 19% used other sources of feed for their fish.

Table 11. Distribution of farmers by type of feed

	Frequency	Percent
Locally made	36	36.0
Imported	45	45.0
Others	19	19.0
Total	100	100.0

The budgetary table showed the cost and return analysis where the total fixed cost and total variable cost represents 18.0 percent and 82.0 percent of the total cost of production respectively for e fish farmers. This is contrary to [20], where the fixed cost was having a higher percent than the total variable cost. The higher value for variable cost may be due to the high cost of feed. The gross margin of N50,153,780 of the farmers and a net farm income of N49, 632, 580 of the respondents, which indicates that fish farming is profitable to the farmers in the study area. This is in line with [15].

Table 12. Budgetary analysis

Item	Amount (N)
Total revenue (TR)	52,500,000
Total fixed cost (TFC)	521200
Total variablecost (TVC)	2346220
Total cost (TC)	2867420
Gross margin (TR - TVC)	50153780
Net farm income (TR - TC)	49632580

The analysis of ratios in Table 13. shows that the expense structure ratio 0.22 shows that 22 percent of the total cost of the fish farming enterprise was made up of fixed cost items. The rate of returns 17.31of the fish farmers. This implies that for every one naira invested, N17.31 kobo was gained. This huge profit margin could be due to the ban of importation on some of the agricultural produce, fish products inclusive. The gross revenue ratio of 0.057 indicates that for every N1.00 returns to fish farming enterprise, N0.057is being spent. The gross margin ratio of 0.057 further confirm that the business is profitable to the fish farmers

Table 13. Profitability ratio

Expense structure ratio (ESR) = FC/VC	0.22
Rate of Return on Capital Invested (RORCI) = π/TC	17.31
Gross Ratio (GR) = TFE/GI	0.057

From the table below, the most prevalent problem faced by farmers was lack of finance, according to [18], says that if farmers possess credit, he could overcome his destruction by applying credit to purchase needed equipment goods and services to attain a more efficient use. While lack of extension visit was ranked least with 85% of the respondents disagreed that that was not a problem, which signifies that the farmers can still remain in production with or without extension agencies.

Table 14. Challenges faced by the fish farmers

	Highly important problem	Important problem	Less important problem	Not a problem	Total
Limited finance	77 (77%)	23 (23%)			100 (100%)
High cost of inputs	58 (58%)	38 (38%)		4 (4%)	100 (100%)
Poor quality fingerlings	42 (42%)	35 (35%)	2 (2%)	23 (23%)	100 (100%)
Scarcity of raw materials	23 (23%)	39 (39%)	------	38 (38%)	100 (100%)
Lack of storage facility	20 (20%)	40 (40%)	20 (20%)	20 (20%)	100 (100%)
Marketing of produce	24 (24%)	76 (76%)			100 (100%)
Lack of ext. Service	12 (12%)	3 (3%)	55 (55%)	30 (30%)	100 (100%)

4. RECOMMENDATIONS

Based on the outcome of this study, the following recommendations were needed: -

1) Extension agent should play active role in disseminates useful information's practices that will increase farmer's efficiency of fish production.
2) Adequate farm inputs like feed, fingerings should be made available and affordable to farmers in the study area on time.
3) Young people should be encouraged to practice fish farming, and also involve in carrying out research on fish farming as this may help in solving the problem of food security and food sufficiency.

5. CONCLUSION

The study examined the profitability ratio of fish enterprise in ikenne local government area of Ogun State, Nigeria.

Majority of the fish farmers were married with age between 31 to 40 years.

The farmers were educated with household size 2 - 4 persons. Few of the farmers had access to extension agent and most of them had been in fish production business for less than 5 years. The results the budgetary analysis showed the cost and return analysis where the total fixed cost and total variable cost represents 18.0 percent and 82.0 percent of the total cost of production respectively for the fish farmers. The gross margin of N50, 153, 780 of the farmers and a net farm income of N49, 632, 580 of the respondents, which indicates that fish farming is profitable to the farmers in the study area.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Federal Ministry of Agriculture and Natural Resources; 2007.
2. Food and Agricultural Organization. Nutritional Benefit of Fish; 2005a. Available:www.fao.org/docip//68 (Retrieved, 11.11.2006)
3. Federal Office Statistics; 2008.
4. Central Bank of Nigeria Report; 2005.
5. Food and Agricultural Organization. Small Scale Aquaculture in Sub-Saharan African. Revisiting the Aquaculture Target Group Paradigm. Rome: FAO Fisheries; 2005b.
6. Federal Ministry of Agriculture and Rural Development; 2011.
7. Ndu NR. Fish farm layout, pond construction, management and maintenance-hatchery techniques. A paper presented at the National Workshop on the Principles and Techniques of Fish Farming organized by Nigerian Agricultural, Cooperative and Rural Development Bank Kaduna with collaboration of Life Riches Consulting; 2006.
8. Anyawu-Akeredolu B. Urban Aquaculture in Nigeria. World Society Annual Report; 2005. Available:www.was.org/meetings/abstractdata (Retrieved 02.10.2000)
9. Fagbenro OA. Evaluation of cotton seed cake as fish feed and pond fertilizer in the production of noncichildfishes. Journal of Applied Fisheries and Hydrobiology. 2005; 3:9-14.
10. Federal Department of Fisheries (FDF). Nigeria National Aquaculture Strategy. Assisted by FAO. Formally approved; 2009.
11. Olaoye Olalekan Jacob, Odebiyi Oluwaseun Christianah. International Journal of Fisheries and Aquaculture. 2010;3(4):71-78.

12. Afodu Osagie John, Makinde Yetunde Olawunmi, Bello Ayodeji Taofeek, Ndubuisi-ogbonna Lois Chidima, Akinboye Olufunso Emmanuel. Gender analysis of culture fish enterprises in Epe Local Area of Lagos State, Nigeria. International Journal of Sciences: Basic and Applied Research (IJSBAR); 2016.
ISSN: 2307-4531

13. NBS. Nigeria bureau of statistics annual abstract of statistics. 2006 Population Cencus. 2007;5-34.

14. Olayide SO, Heady EO. Introduction to agricultural production economics. Ibadan: Ibadan University Press; 1982.

15. Makinde Yetunde O, Afodu Osagie J, Balogun Olubunmi L, Awoyinka Iyabo R, Bello Taofeek A. Budgetary analysis and factors influencing profit level of culture fish enterprises by gender in Epe Local Government Area of Lagos State, Nigeria. International Journal of Agriculture Innovations and Research. 2015;3(6).
ISSN: (Online) 2319-1473.

16. Kareem RO, Ayinde IA, Badmus MA, Bakare AH, Alawode OO. Technical efficiency of artisanal fisheries in Ijebu waterside of Ogun State, Nigeria'. Journal of Agricultural Economics and Development. 2013;2(1):035-043.

17. Munir Ahmad, Rafiq M, Ali A. An analysis of technical efficiency of rice farmers in Pakistani Punjab. The Bangladesh Journal of Agricultural Economics. 1999;XXII(2), 1999;79-86.

18. Ijere MO. Agricultural credit and economic development. In: Ijere MO; Okorie, A (eds) Readings in Agricultural finance, Longman, Lagos. 1998;4–9.

19. Kareem RO, Dipeolu AO, Aromolaran AB, Akegbejo Samson. Analysis of technical allocative and economic efficiency of different pond system in Ogun State, Nigeria. African Jounal of Agricultural Research. 2008;3(4):246-254.

20. Raufu MO, Adepoju MO, Salau AS, Adebiyi OA. Determinants of yield performance in small scale fish farming in Alimosho Local Government Area of Lagos state. International Journal of Agricultural Economics and Rural Development 2.1. 2009;9-14.