The Analysis of Cost and Returns of Fish Farming in Kontagora Local Government Area of Niger State, Nigeria

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Abstract

The study examined analysis of costs and return of fish farming in Kontagora Local Government Area (LGA) of Niger State, Nigeria. A purposively sampling technique was used to select thirty five (35) active fish farmers from the study area, structured questionnaire was administered to sampled respondents. Data collected were analyzed using descriptive statistics frequency and percentages, while budgetary and gross margin was used to determine net farm income (NFI). The study indicates that variable cost accounted for (98.27%) of the total cost while fixed cost of production accounted for 1.73%. The result shows that average total cost (TC) of ₦274,664.28 was incurred by the respondent per production cycle while average total revenue (TR) of ₦427,685.00 was realized with a returning gross margin (GM) of ₦157,761.23 and a net farm income (NFI) of ₦152,930.75 per production cycle, implying that fish farming is profitable in the study area. The study recommends capacity building for fish farmers in technical areas such as self-feed formulation and government should try to address the insecurity challenges affecting the study area.

Keywords

Costs, Return, Fish Farming, Socio-Economic, Constraints, Study area

1. Introduction

Aquaculture is the rearing of growing fin fish and shell fish under controlled condition [1] and also the rearing of aquatic organisms under controlled or semi-controlled condition such as (Gold fish, Shrimps, topminnows, aquatic plants like algae) stocked in ponds, streams reservoirs and oceans grown for economic and social benefits. Fish farming which is also known as fish culture is the rearing of fish in an enclosed environment, such as fish ponds cages, plastic tanks and wooden environment. It is a form of controlling of the environment or intervention in the rearing process to enhance production such as regular stocking, feeding, protection from diseases and predators as well as good husbandry practices [2].

Fish farming accounts for about one-fifth of the world supply of animal protein and this has rising five-folds over the recent years from 20 metric tones to 98 million metric tones from the past decades [3]. This profitable achievement was recorded as a result of increase in awareness in recent years the readiness of fish marketing, economic benefits and gained in fish farming. Single species of fish can be reared in pond or multiple species may grown in the same pond depending on the stocking density. The best fish farming, one that does not reach sexual maturity until after reaching market size, it is obvious that fish farming has the potential of expand the resources base and reduce the pressure on conventional.

The exorbitant cost of inputs especially that of feeds is among the constraints in fish farming. Cost of fish feed rose

above the reach of most small scale farmers and drastically reduced the profit margin of fish farming. Given the above, fish farmers are faced with the problem of deciding which enterprises to embark on or to continue with fish farming. The farmers' concerns in this regard are the cost implications and returns from their choice of enterprise. Researchers in the study area have not adequately addressed the economics of fish farming enterprise with the aim of determining its profitability and benefit. Also, because of the increasing need for animal protein consumption in the local government area and the state at large, the threat of fish farmers leaving the business will be addressed by this investigation to enable the farmers make more informed decisions towards production. The specific objectives of this study are therefore to determine the effects of socioeconomic characteristics of fish farmers on output and to estimate the cost and returns in small scale fish farming enterprise.

2. Methodology

2.1 Study Area

This study was conducted in Kontagora Local Government Area of Niger State. The local government lies in the Northern Guinea Savannah zone between Latitude $3^{\circ}20'$ and $7^{\circ}40'$ East and Longitude 8° and $11^{\circ}3'$ North. The climate is characterized by distinct dry and rainy season [4]. The major occupation of the people of the local government area is farming and livestock production, they are predominantly practicing subsistence agriculture. The main agricultural products include Groundnut, Sorghum, Maize and Cowpea. Livestock production activities like poultry, cattle, sheep and goats in fairly large scale mostly on free range. This study focused on fish farmers in the local government area of the state.

Primary data were collected with the aid of structured questionnaires and interview schedules between September 2020 and February, 2021. A purposive sampling method was used to select 35 active fish farmers within the local government area from the list of fish farmers obtained from Niger state Agricultural Mechanize and Development Authority (NAMDA) zone iii. Information was gathered on the socio-economic characteristics of the respondents and their fish production operation or activities. The data were analyzed using descriptive statistics, gross margin analysis was used to ascertain the profitability of fish farmers in the study area. The gross margin is the difference between the gross farm income (GFI) and total variable cost (TVC). It is a useful planning tool in situation where fixed capital is negligible portion of the farming enterprises in the case of small-scale subsistence agriculture [5]. They further stated that gross margin analysis enables the estimation of the total expenses (costs) as well as various receipts (revenue or returns) within a production period. It is expressed as: $GM = GFI - TVC$ $NFI = TGM - TFC$ Where: GM = Gross Margin, GFI = Gross Farm Income, TVC = Total Variable Costs, TFC = Total Fixed Costs, NFI = Net Farm Income.

3. Results

3.1 Socioeconomic characteristics of the fish farmers in the study area

Socioeconomic characteristics of the fish farmers which could be relevant in influencing output were examined. These include age of respondents, gender, marital status farming experience and level of education.

3.2 Cost and return analysis of fish farmers in the study area

The analysis of cost and return result of fish farming in the study area is shown in Table 2.

3.3 Constraints faced by fish farmers in the study area

Fish farmers were confronted with a number of problems in fish farming enterprise in the study area:

4. Discussion

Base on the results in Table 1, it shows that majority of the respondents fall in the active age bracket of 31-50 years with 65.71 percent, economically farmers generally including fish farmers in developing countries has been reported to be in the middle age, that is 30-50 years, this age range is considered as an active productive age in the production process [6]. Majority of the fish farmers in study area 94.29% are males and only (5.71%) were females showing fish farming in the study area is dominated by the males which 63% were married while (28.57%) were single, (5.71%) widow and (2.86) were separated. Table 1 also revealed high proportion of 62.86 percent had fish farming experience of 6-20 years and above, showing that the respondents had quiet reasonable years of farming experience, high proportion (88.57%) of the fish farmers had one form of education or the other. The farmers can therefore be said to be literate since only small proportion of them had no formal education. The results compares favorably with [7].

Table 2 shows an average total cost outlay of ₦274,663.85 was recorded out of which ₦269,923.77 was incurred as total variable cost of fish farming in the study area, the result shows average cost of feed to be the highest cost incurred

₦128,310.67 with (47%) cost of production, followed by cost of fingerlings ₦67,315.70 (24.51%), these two accounted for bulk of the variable cost, [8] recorded similar result on profitability and technical efficiency of cultured fish farming in Kainji lake basin, Niger State Nigeria. The lowest variable cost was found on medication which indicates proper water quality parameter management that may not render the fish susceptible to disease. The result in Table 2 further indicated total fixed cost stood at ₦4,740.51, consists of cost of fixed assets such as pond/equipment, septic tanks, water facilities, harvesting nets, weighing scales and generator, While the total average revenue obtained from all the respondents was ₦427,685.00. The estimated net farm income (NFI) was 152,930.75 and gross margin was 157,761.23. This implies that fish farming in the study area was a profitable enterprise and has contributed positively to the income of the respondents. This result agrees with the findings of [9] that reported fish farming is a profitable venture in the state as a result of positive net returns and high rate of incomes in their study of profitability analysis of fish farming in Niger state.

The results presented in Table 3 revealed all the respondent (100%) indicated high cost of feeds as their major problem in the business and was ranked first. Similarly 100 percent of the respondents considered high cost of fish feed as a problem facing fish production in Oyo state as reported by [10], “of the assessment of socio-economic analysis of fish farming in Oyo State, Nigeria”. Second ranked problem associated to fish farming was lacking of quality fingerlings 94.28 percent which may be due to distance of the study area to professional fish hatchery considering the dilapidating nature of Nigerian roads network. The problems of insecurity and poor marketing strategies were both ranked third with (88.57%) each, this signifies the negative effect of social-ills (Banditry and Kidnapping) affecting the study area. Other constraints faced by fish farmers in the study area include Water scarcity, inadequate funds, poor road condition, Poor power supply and Lack of extension contact.

Table 1. Socio-economic characteristics of fish farmers

Variable	Frequency	Percentage
Age<21	3	8.57
21-30	5	14.2
31-40	14	40.00
41-50	9	25.71
>50	4	11.43
Total Gender	35	100
Male	33	94.29
Female	2	5.71
Total Marital Status	35	100
Married	22	62.86
Single	10	28.57
Widow	2	5.71
Separated	1	2.86
Total Fish farming Experience	35	100
1-5	13	37.14
6-10	12	34.29
11-15	5	14.29
16-20	3	8.57
>20	2	5.71
Total Educational Level	35	100
Adult Education	4	11.43
Primary	6	17.14
Secondary	11	31.43
Tertiary	14	40.00
Total	35	100

Source: field survey, 2021.

Table 2. Average costs and returns of fish production in the study area

Item	Amount (₦)
Revenue	427,685.00
Variable cost	
Fingerlings	67,315.70
Feeds	128,310.67
Labour	35,513.00
Fertilizer	8,754.00
Liming	4,665.00
Pond maintenance	8,050.00
Transport	13,450.00
Medications	3,865.40
Total Variable Cost (TVC)	269,923.77 (98.27%)
Fixed cost	
Pond/equipment (depreciation)	1,545.00
Septic tanks (depreciation)	628.43
Water facilities (depreciation)	1,057.00
Harvesting Nets (depreciation)	335.08
Weighing Scales (depreciation)	250.00
Generator (depreciation)	925.00
Total Fixed Cost (TFC)	4,740.51 (1.73%)
Total Cost (TC)	274,664.28
Gross Margin (GM)	157,761.23
Net Farm income (NFI)	152,930.75

Source: field survey, 2021.

Table 3. Constraints faced by fish farmers in the study Area

Category	Frequency	Percentage	Ranked
High cost of feeds	35	100	1 st
Lack of quality fingerlings	33	94.28	2 nd
Poor marketing strategies	31	88.57	3 rd
Insecurity	31	88.57	3 rd
Water scarcity	29	82.85	4 th
Inadequate funds	26	74.28	6 th
Poor road condition	25	71.42	7 th
Poor power supply	21	60.00	8 th
Lack of extension contact	19	4.28	9 th

Source: field survey, 2021.

5. Conclusion and Recommendations

The study analyzed the cost and returns of fish farming in Kontagora local government area of Niger State, Nigeria. Socioeconomic characteristics of the fish farmers revealed 65.71 percent of the respondents fall in the active age bracket of 31-50 years and majority of them were male with (94.29%). The Gross Margin (GM) and Net Farm Income (NFI) were employed for the analysis, the empirical results showed that the GM of ₦157,761.23 and NFI ₦152,930.75 were

obtained from the study. This indicates that fish farming was highly profitable in the study area. The study therefore recommended that capacity building for fish farmers in technical areas such as self-feed formulation be organized so that the knowledge of self feed formulation will be taught to them to reduce the cost of fish feed. Farmers need to be educated on importance of organizing and participating in fish farmers' co-operative society and government should try to address the insecurity challenges affecting the study area.

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