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Economics of Catfish Farming in Selected Local Government Areas of Taraba State, Nigeria

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Abstract

The study analysed the economics of fish farming in selected local government areas of Taraba state, Nigeria. The specific objectives were to: describe the socio-economic characteristics of fish farmers in the study area; estimate the cost and returns of fish farming in the study area; determine the relationship between input and output in fish farming in the study area; and identify the constraints faced by fish farmers in the study area. It utilized mainly primary data. For the purpose of this study, well-structured questionnaires were used to collect information from 80 fish farmers in the study area. Descriptive statistics as well as inferential statistics such as multiple regression and budgetary analysis were used to analyse collected data. It was observed that average output of fish was 992.15 kilograms. The double-log functional form of regression was chosen as the lead equation, showing that the output of fish farming is positively associated with pond size and educational level while it is negatively related to contact with extension agent. The t-ratio for pond size and educational level were significant at 5 percent level while that of contact with extension was significant at 10 percent level. Furthermore, results indicate that fish farming is a viable and profitable enterprise capable of providing employment opportunities in the rural communities. Based on the findings it was recommended among others that training and posting of more Agriculture Extension Officers (AEO) with aquaculture background to train the farmers and assist them in testing new technologies, advising fish farmers to properly cost all the resource inputs used in the fish farming activities including family labour with the view to genuinely assess the economic worth of fishing enterprises as well as educating the farmers on proper record keeping so as to assess the economic growth or profit status of the farm.

Keywords: Economics; Catfish; Fish farming

Introduction

Fish farming in Nigeria is a business enterprise with many uncertainties and risks because of the management of the fingerlings to maturity and most people have fears of not making profit in an event of disease outbreak or death of the fingerlings. Many Nigerians view

the enterprise as a non-profitable one and do not venture into it. Fish farming in Nigeria till date remains an untapped goldmine based on the fact that Nigeria is a maritime nation blessed with a coastline measuring approximately 853 kilometers. According to Tunde., *et al*. (2015), fish farming in Nigeria helps in the achievement of self-sufficiency in aquatic products supplies, contributing to the improvement of human nutrition, generating new source of employment in rural earning foreign exchange through export or saving foreign exchange through import substitution, promoting agro-industrial development which could include processing and marketing of fishery products, feeds and equipment for fish farming, and seaweed culture for the production of marine colloids, pearl oyster culture. Olaoye., *et al*. (2013) carried out a research on assessment of socio-economic analysis of fish farming in Oyo State, Nigeria, Joshua., *et al*. (2012) studied economic viability of catfish farming in Nasarawa State and Olawumi., *et al*. (2010) researched economic analysis of homestead fish production in Ogun State Nigeria but there was no research into the economics of catfish farming in Taraba State which has hindered the vast opportunities that exist in this enterprise in the state waiting to be exploited, which will in all ways improve the profit margin of the farmers, create more job opportunities, increase the quality of catfish delivered to the consumers also ensuring the availability all year round. Undeniably, there is a crucial gap in the economic analysis in catfish farming in Taraba State. Due to the aforementioned scenario, this study therefore intends to bridge the research gap by analyzing the economics of catfish farming in Taraba State, Nigeria.

Materials and Methods

Snowball sampling technique, which involves using the contacted respondents to identify subsequent respondents, was used to contact 80 respondents for this study. The data were collected from across the state, comprising of responses from catfish farmers from six local government areas (Zone 1: Ardo-Kola and Jalingo, Zone 2: Ibi and Wukari, Zone 3: Donga and Kurmi) of the four agricultural zones of Taraba State. Data for this study were collected mainly from primary source using questionnaires. The population for this study was made up of all the catfish farmers in the study area. Data on socio-economic characteristics, inputs cost, revenue from output, constraints and variables for the relationship between input and output were obtained from the responses of catfish farmers. Simple descriptive statistics such as frequency, percentages and mean were used to describe and identify the socioeconomic characteristics of catfish farmers and also constraints faced by catfish farmers. Profitability analysis was employed to determine the profitability of catfish farming while the multiple regression model (with the four functional forms) was employed to determine the influence of inputs on the catfish output level.

The model for the multiple regression is specified as follows:

$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, e_i)$

Where:
Y = Catish output (Kg)
X_1 = Pond size (m3)
X_2 = Fingerlings (number)
X_3 = Labour in mandays
X_4 = Feeds (Kg)
X_5 = Drugs (Kg)
X_6 = Water (L)
X_7 = Age of farmer (years)
X_8 = Household size in number
X_9 = Formal education (years)
X_{10} = Experience (years)
X_{11} = Number of contact with extension workers

Results and Discussion

Socioeconomic characteristics of the respondents

Socioeconomic characteristics of respondents are presented in table 1. Majority (60%) were males, this is consistent with earlier studies of Banjo., *et al.* (2009), who noted that the dominance of males in fish farming enterprise conforms to the fact that fish farming, is highly laborious and technically demanding. Also in concordance to this is the report of Agboola (2011) who stated that the higher number of male participation in fish farming indicated the extent of gender sensitivity on occupation like farming, which could be attributed to the fact that agricultural production is faced with a lot of risk and uncertainties and women are risk averse, result of drudgery that aquaculture business is involved in. It was observed that 43.8% of the fish farmers fall within the age of 42-51 years. This is in agreement with the observations of Banjo., *et al.* (2009) who found out that the farmers' ages falls within the economically active age (below 60 years). With the current high rate of unemployment in the country, most young people have been reported to resort to fish farming. 91.3% of the respondents were married. This could be attributed to the western culture and tradition of this area where people are encouraged to marry at an early stage in life. The married were more involved in fish farming could be as a result of the family responsibilities of the respondents.

This is also in agreement with an earlier research by Filli (2015) who found out that those that are married were more than those of other marital status. Majority of the catfish farmers owned a farm holding of 1.0 hectares (45%), closely followed by farmers with holdings of 2.0 hectares (42.5%). This agrees with PIND (2011) who observed that a considerable large population of the fish farmers are small farmer holders and are fragmented despite the vast opportunities in this enterprise. On the average, there existed an average household size of 6.5, which is in agreement with the observations of Onemolease and Oriakhi (2011). They implied that fish farmers have large household which is believed to constitute an important labour source for them. Sixty three percent of the respondents were civil servants, traders 15%, business owners were 11.3% and farmers were 10%. This could be attributed to the fact that most catfish farmers in the study area were engaged in other occupation in order to augment their income to enable them cater for their dependents needs. Civil servants also correlate with those that had higher level of education showing a positive relationship between education and civil service and also catfish farming was not as time demanding as other agricultural activities which enabled civil servants to engage in it. This was in agreement with Filli (2015); Yusuf et al. which stated that an indication of high literacy level is required for effective management of catfish farms. Also, the positive influence of education on farmers' acceptance of improved farm practices has been established by several studies (Onemolease and Oriakhi, 2011). Majority (62%) who are civil servants as reflected on the major occupation of catfish farmers used personal savings for fish farming business. It was observed that an average experience age of 6.3 years exists among the catfish farmers in this area. This is in line with opinion of Onemolease and Oriakhi (2011) who noted that experience is highly needed in the enterprise of fish farming.

Table 1: *Descriptive statistics of respondents.*

Socioeconomic characteristics	Frequency	Percentage
Sex	Frequency	Percent
Male	48	60.0
Female	32	40.0
Age	Frequency	Percent
32-41	21	26.2
42-51	35	43.8
52-61	22	27.5
62-71	2	2.5
Marital Status	Frequency	Percent
Married	73	91.3

Single	5	6.3
Widowed	2	2.5
Farm Size (ha)	**Frequency**	**Percent**
1	36	45.0
2	34	42.5
3	2	2.5
4	8	10.0
Household Size	**Frequency**	**Percent**
1-5	45	56.2
6-10	31	38.8
11-15	4	5.0
Major Occupation	**Frequency**	**Percent**
Civil Servant	51	63.8
Trader	12	15.0
Business Owner	9	11.3
Farmer	8	10.0
Educational Level	**Frequency**	**Percent**
No Formal Education	4	5.0
Secondary School Education	20	25.0
Tertiary Education	56	70.0
Source of Income	**Frequency**	**Percent**
Personal Savings	62	77.5
Borrowed	18	22.5
Experience (Years)	**Frequency**	**Percent**
0-5	30	37.5
6-10	50	62.5

Table 2 below shows the profitability of fish farming in the study area. The mean profit of the respondents was ₦165,663.95. Therefore, the return per Naira invested was ₦0.47. This therefore, established that fish farming was profitable in the study area. Thus being in concord with the work of Filli, (2011), Olagunju., *et al.* (2007), Kudi., *et al.* (2008) and Emokaro., *et al.* (2010) who reported positive profit margins associated with fish farming. However, the business is capital intensive especially the running cost that needs proper planning and implementation.

The regression result shows that, the independent variables combined are responsible for 99% of the variation in the output of fish in the study area due to pond size, fingerlings, labour, feed, drugs, water, age, household size, education level, farming experience and number of contacts with extension agents. The remaining 1% was caused by miscellaneous cost. The entire equation measured by the F ratio (2540.396) was significant at 1% probability level. The result further shows that to pond size, fingerlings, labour, feed, drugs, water, household size, education level and number of contacts with extension agents important determinants of quantity of fish output. Age and farming experience did not have effect on the output of fish in the study area.

Table 2: *Profitability of fish farming.*

	Items	Mean Value (₦)	
A	Variable Cost (Naira)		Percentage of Variable Cost (%)
	Fingerlings	38,976.25	41.19
	Feed	29,625.00	31.31
	Water	1,092.50	1.15
	Fuel	3,003.12	3.17
	Drugs	6,430.00	6.80
	Labour	9,897.50	10.46
	Transportation	1,322.38	1.40
	Veterinary Services	4,281.25	4.52
	Total Variable Cost (TVC)	94,628.00	100 %
B	Fixed Cost		Percentage of Fixed Cost (%)
	i. Land	226,375.00	88.97
	ii. Depreciation on Capital	3,391.43	1.33
	iii. Interest	24,687.50	9.70
	Total Fixed Cost	254,454.93	100
C	Total Cost		
	Total Variable Cost	94,628.00	
	Total Fixed Cost	254,454.93	
	Total Cost	349,082.93	
D	Return		
	Total Revenue	514,746.88	
E	Profit (D – C)	165,663.95	
	Return/naira invested (Profit/TC)	0.47	

Source: Field Survey (2017)

Table 3: *Regression results of relationship between input and output.*

Variables	Coefficient	t-value
Constant	1.260	(7.774)*
Pond Size	0.070	(2.181)**
Fingerlings	0.663	(29.007)*
Labour	0.107	(3.305)*
Feed	0.136	(3.147)*
Drugs	0.058	(4.223)*
Water	0.026	(2.515)*
Age	0.027	0.673
Household Size	0.059	(3.501)*
Education Level	0.047	(2.347)**
Farming Experience	-0.011	-0.391

Number of Contacts	-0.038	(-1.773)**
R^2	0.992 (99%)	
F	(2540.396)*	

Source: Field Survey (2017)

Constraints faced by fish farmers in the study area are presented in Table 4 below. It shows that flood tops the problems faced by fish farmers in the study area, unavailability of good breeds was the second among the problems followed by lack of records, No market outlet and inadequate drugs were ranked third, fourth and fifth respectively.

Table 4: *Constraints faced by fish farmers in Taraba State.*

Constraint	Mean	Ranking
Flood	2.1750	1st
No good breeds	2.0625	2nd
No records	2.0625	2nd
No market outlet	2.0500	4th
Inadequate drugs	2.0375	5th

Source: Field Survey (2017)

Conclusion

Based on the findings, the study concludes that catfish farming is profitable with a positive profit of ₦165,663.95 and several constraints militating against fish farming include flood, no good breeds, no records, no market outlets, and inadequate drugs. It also concludes that fish farming is positively associated with to pond size, fingerlings, labour, feed, drugs, water, household size, education level and number of contacts with extension agents

Based on the above findings in this study, the following recommendations were made.

- Training and posting of more Agriculture Extension Officers (AEO) with aquaculture background to train the farmers and assist them in testing new technologies as well as advising fish farmers to properly cost all the resource inputs used in the fish farming activities including family labour with the view to genuinely assess the economic worth of fishing enterprises. More extension services should also educate the farmers on proper record keeping so as to assess the economic growth or profit status of the farm.
- Awareness should be made to educate farmers on the site suitable for pond construction in order to avoid flood.
- There is need for research into the development of good breeds that can survive certain environmental stress.
- Fish farmers should organize themselves into forming cooperative societies that would enhance procurement of credit facilities and attraction of both government and non-governmental agencies which would bring along essential inputs required for fish farming as well opening marketing channels for their output.
- The veterinary centres should include drugs that have to do with fish in their enterprise so as to make the drugs readily available to fish farmers as well as eliminate their traveling to far distances to purchase drugs

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