

Profitable Fish Farming Towards the Attainment of the Millennium Development Goals (MDG): A Case of Catfish Farmers in ABA Agricultural Zone of Abia State, Nigeria

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ABSTRACT

The study examined fish farming towards the attainment of the Millennium Development Goals (MDGs): A case of catfish farmers in Aba North LGA, Abia State, Nigeria. A multi-stage random sample of 60 farmers were used and interviewed with validated and structured questionnaire. Data were analyzed using descriptive statistical tools such as frequency distribution, averages, tables and multiple regression analysis. Results of the regression analysis showed that level of education, farming experience, pond size and credit were determinants of a profitable fish farming. Farmers should be given credit assistance such that they can embark on large scale farming to enhance food security. This will enhance the attainment of Millennium Development Goals (MDGs) especially in the study area.

Keywords: *Millennium Development Goals, Fish Farming, Profit*

1. INTRODUCTION

One of the goals of Millennium Development Project (MDG) is halving of hunger and poverty by the year 2015 (FAO, 2004). This largely depends on agriculture. The attainment of this goal has been a mirage as evident in the dwindling contribution of agriculture to gross domestic product over the years. This is not befitting to the country as agriculture is the bane of Nigerian economy. However, Nigeria is blessed with abundant land and water resources and with favorable atmosphere which supports plant growth (Bamigboye et.al., 2010). This implies large to scale fish farming can ensure adequate food supplies. These potentials of fish farming lies in the fact that Nigeria is capable of producing fish that can meet the standard protein requirement of her people. Moreso, when compared with livestock, fish requires less space, time, and money and has a high feed conversion rate (FAO, 2001). This will enhance the food security of the nation thereby leading to the attainment of the first goal of the MDG – halving of hunger and poverty by half by the year 2015. Hence, the place of agriculture in economic development and food security partly depends on the viability of the fishery sub-sector. This is because fish farming is a profitable venture (Williams et.al. 2010), which provides 40-50% of protein intake from animal sources (Adeniji, 1987), source of food (Yunusa and Dantata, 2010) and generates employment as well as foreign exchange (Yunusa and Maidala, 2008). Fish has many unique nutritional values when compared with other animal sources (Delgado et.al., 1997). Besides, it is the cheapest source of protein worldwide (Nzeka, 2011). In fact, fish farming is a means of poverty alleviation and hunger reduction, a guarantor of livelihood and means of food security (Edward and Damane, 1997). Fish farming is expanding rapidly and will continue to be profitable with planning and management (Runfu et .al., 2009). Regrettably, there is a wide gap between demand and supply of fish (Kester, et.al., 2007). This is evident in the

fact that out 35grams of animal protein per day per person recommended by FAO, less than 7grams is consumed in the average (FAO, 2006). This is an indication that Nigeria has not been able to provide animal protein sufficient enough to meet the per capita animal protein requirement of the people. This is a matter of serious concern as the demand for fish is currently 2,168,000 while total production of fish per annum is about 452,146 metric tons (FAO, 2002). Therefore there is a need for the country to turn to their underutilized inland water and improved fish production (Ezike, 2011).

2. MATERIALS AND METHODS

The study was carried out in Aba agricultural zone of Abia state. The zone is made up of 9 Local Government Areas. Multi-stage random sampling technique was used to select the respondents. In the first stage, 5 local government areas were selected from the study area. In the second stage, 2 communities were randomly selected from each LGA. Then finally, 6 fish farmers were also randomly selected from each community with the assistance of the list compiled by the ADP extension agent. This made a sample of 60 fish farmers.

Data were collected from both primary and secondary sources. Primary data were obtained with the aid of a well structured questionnaire and personal interview. Secondary data were obtained from relevant current literature. Data were collected on the socio-economic characteristics of respondents, output, input, prices etc. Data collection period covered the 2011 crop production year.

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Data were analyzed using simple descriptive statistical tools, net return model and ordinary least square multiple regression technique.

The net return model is expressed as:

$$\Pi = TR - TC$$

Where,

$$\Pi = \text{Profit (N)}$$

$$TR = \text{Total Revenue}$$

$$TC = \text{Total Cost}$$

$$TVC = \text{Total Variable Cost}$$

The multiple regression models are expressed as:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, e)$$

Where,

Y	=	Profit (naira)
X ₁	=	age of respondents (years)
X ₂	=	household size (number of persons)
X ₃	=	level of education (years)
X ₄	=	farm size (hectares)
X ₅	=	farming experience (years)
X ₆	=	membership of co-operative group (number)
X ₇	=	cost of maintenance of irrigation facilities (naira)
X ₈	=	cost of labor (naira)
e	=	error term

It is expected a priori that $X_2, X_3, X_4, X_5, X_6 > 0$; X_1, X_7 , and $X_8 < 0$

3. RESULTS AND DISCUSSION

Table 1: Socio-economic characteristics of the farmers

Variable	Frequency	Percentage
Age (years)		
21 – 30	7	11.67
31 – 40	13	21.67
41 – 50	19	31.67
51 – 60	15	25.00
61 – 70	6	10.00
Mean	42.5years	
Marital Status		
Married	50	83.30
Single	10	16.70
Sex		
Male	44	73.33
Female	16	26.69
Household Size		
1 – 5	38	63.33
6 – 10	18	30.00
11 – 13	4	6.67
14 and above	2	5.00
Mean	5persons	
Level of Education		
0	2	3.33
1 – 6	8	13.33
6 – 12	14	23.34
13 and above	25	60.00
Mean	5years	
Farming Experience		
1 – 10	40	66.67
11 – 20	11	18.33
21 – 30	6	10.00
31 and above	3	5.00

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Mean	9.8 years	
Farm Size (ha)		
100-500	5	8.33
501 - 1000	8	13.33
1001 - 1500	12	20.00
15001 – 2000	13	55.00
2001 and above	2	3.33
Mean	1371 fishes	
Access to Credit		
Yes	22	36.67
No	38	63.33
Total	60	100.00

Source: Field Survey data, 2011

Table 1 showed that the mean age of the farmers was 42.5 years. This suggests the considerable involvement of youths in the enterprise. This agrees with the findings of (Orebiyi et.al.). The mean level of education of 5years suggests that fish farming is in the hands of enlightened people in the area. This is an indication that the fish farmers are reasonably educated. Level of education influence farmer's adoption rate which agrees with Alene et. al., (2000) who reported the relationship between education and farmer's rate of adoption of improved practices. The farmers are reasonably experienced in fish farming, this is evident in

their 9.8 mean years of experience as fish farmers. This is consistent with Maidala and Dentate (2010) who observed that most of the farmers have less than ten years of experience. This could be due to the presence of such projects as FADAMA. High farming experience enables the farmers face production constraints (Henri-Ukoha et.al. 2011). The mean pond size of 1371 fishes show that fish farming is dominated by small scale farmers in the area. This limits the ideals of the Millennium Development Goals. Moreover, the mean household size of 5 persons indicates that the farmers had reasonable family labor that could help in farming activities.

Table 2: Net Returns of Fish farming

Variables	Unit	Value (N/tonne)
Revenue		
Fish	135kg @ N600/kg	810000
Variable Cost		
Fingerlings		34275
Feed		320580
Labor	180md @ N800/man-day	162000
Transportation		12000
Storage		1000
Medication		5200
Total Variable Cost		535055
Fixed Cost		
Water rate		6730
Depreciation (pond and equipment)		3173
Insurance, tax and commission		1152
Total Fixed Cost		11055
Total Cost		546110
NFI		263890
GM		274945
Returns		1.48

Source: Field Survey data, 2011

*1US Dollar = N155

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Table 2 show the analysis of profitability of fish farming enterprise per hectare. The total variable cost was ₦535,055. The revenue was ₦810,000. The gross margin was ₦274945 , 000/pond. Meanwhile, the net

farm income was ₦263,890. However, the rate of return on the business was as 1:48. This implies that for every one naira spent in the fish farming business 48k was returned. Hence fish farming in the area is profitable.

Table 3: Results of the multiple regression analysis of the factors affecting Net Returns from Fish Farming

Variable	Linear	Semi-Log	Double-Log	Exponential
Age X_1	-13.0942	-1.4465	0.0826	-0.0046
	-1.0913	-1.1288*	-1.1522	-1.1795
Water X_2	-12.0806	-3.8861	0.0743	-0.0074
	-2.9232	-1.2744	-3.4398**	-2.6429*
Credit X_3	10.8861	2.9217	0.0395	0.0073
	1.1628	1.2421	3.3491*	2.6071
Education X_4	19.2214	3.9012	0.0882	0.0066
	1.0654	1.2427	4.0274**	3.1429*
Experience X_5	17.4304	1.8614	0.0882	0.0092
	3.4295*	1.5304	4.0274**	-0.0575
Fingerlings X_6	-11.0389	-3.4413	-0.0389	-0.0037
	1.0925	-1.1078	-3.7767**	-1.3361
Pond Size X_7	14.3667	3.8176	0.0689	0.0068
	2.3542*	1.2803	3.0352**	3.5789*
Labor X_8	17.0813	1.6604	-0.0824	0.0091
	1.0601	2.3333*	3.9426**	1.0364
Household Size X_9	-13.3614	-4.3911	0.0552	-0.0083
	-1.1229	1.4146	-1.3206	0.0071
R^2	0.4839	0.4022	0.7164	0.5826
F-ratio	5.2201	3.7554	13.9649	7.7992

Source: Field Survey data, 2011

Figures in parenthesis are t – values; *= significant at 10%, ** = significant at 5%

From table 3, the double-log was chosen as the lead equation based on having the highest value of the coefficient of multiple determinations (R^2) as well as highest number of significant variables. The results show that the coefficients of education (X_4), experience (X_5), pond size (X_7) and labor (X_8) were positive and significant at 5% while credit (X_3) was significant at 10%, implying that the higher they are, the higher would be the profit. Moreso, the coefficients of age (X_1), water (X_2), fingerlings (X_6), and household size (X_9) showed negative relationship implying that the higher they are, the less would be the profit ceteris paribus. This suggests that fish farming can enhance food security hence facilitate the attainment of the MDGs.

The coefficient of multiple determinations (R^2) is 0.7164; this indicates that 71% of the variation in profitability of fish farming could be explained by the independent variables. The F-ratio of 13.9649 is an indication that the variables are significant.

4. CONCLUSION

Fish farming is profitable in the area though is practiced on a small scale. The determinants of profitability of fish farming in the area include level of education, experience, pond size, labor and credit. As fish farming enterprise is profitable, it implies that it has the potentials of meeting the first goal of the Millennium Development Goals.

5. RECOMMENDATION

Policy should be aimed at boosting the level of education and provision of credit facilities. Farmers should form co-operatives such that their resources can be pooled together. This will enhance large scale farming towards the attainment of the millennium development goals.

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