Journal of Animal and Veternairy Advances 4 (6): 598-602, 2005

Profitability of Homestead Fish Farming in Ondo State, Nigeria

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Abstract: The study aimed at the economic analysis of homestead fish farming in Ondo state to determine the profitability or otherwise of the venture. Results were obtained from the analysis using percentages, frequency distribution and descriptive statistics. All the variables; household size, educational status, years of experience, initial capital, age, type of labour used and sex, had positive influence on revenue from this enterprise. The Gross margin analysis indicated that homestead fish farming is profitable. This includes monetary profit and availability of fish in more homes. However, some problems are militating against the productivity, this includes poor feeding culture, lack of good quality fish seeds, inexperience and inability of farmers to reach the Extension workers for adequate fishing education.

Key words: Profitability, homestead, economic analysis, productivity, efficiency

Introduction

The protein need of man and the animals in the building and repair of tissues cannot be overemphasized. Increasing the total dietary intake of animal protein by man has been of great concern to both the Government and International agencies especially in the developing countries where a wide gap exist between food production and human population (FAO, 1999). Fish happen to be the cheapest source of protein available to man.

The implication of increasing fish production means increasing the protein intake of man and its availability for animal feed. This increase can only have a meaningful impact if individuals, Government and International bodies are involved. Homestead fish farming is the rearing of fish in a small scale, meant for subsistence use in a controlled water body at home or backyard. This is an individual effort at increasing protein need of man, primarily his family and as a source of income.

In Nigeria, the annual demand for fish is put at 1.5million metric tones, unfortunately, local production is not more than 0.4million metric tones. This represents only about 26% of the annual demand as produced from all the sectors. These sectors include artisanal fishery, commercial fishery and the homestead fishery, (FAO., 1999). Estimated production of fish is put at 1 tone/hectare/year from small ponds, 3 tone/hectare/year from commercial farms and 32 kg/32 m^2/6 months cycle in a homestead pond (Ezenwa and Uzukwu, 1989).

Small-scale farms comprise a large proportion of aquaculture ventures in Nigeria that range from homestead concrete ponds (25-40 m^2) operated by individual farmer or family to small earthen ponds (0.02-0.2 ha) operated as part-time or off-season occupation by communities, institutions, associations or cooperative societies (Anyanwu *et al*., 1989). Both indigenous and introduced species are cultivated in ponds, reservoirs and cages. Tilapias (*Oreochromis, Sarotherodon*), Clariid catfishes (*Clarias* and *Heterobranchus* and their reciprocal hybrids) and the common/mirror carp (*Cyprinus carpio*) are the most widely cultured fish in Nigeria (Satia, 1990) and are suited to low technology farming systems. This is because of their fast growth rate, omnivorous food habits, resistance to diseases and handling, ease of reproduction in captivity and tolerance to wide range of environmental conditions, (Fagbenro, 1987).

Homestead fish farmers in Akure South Local Government Area sourced their water mainly from rivers and streams, with about 89.1% of them having problems getting enough water for their ponds. Majority of them depended on a combination of both hired labour and family labour to carry out the farming operations. An average of about N8, 000 and N20, 000 was expended as initial capital and the quantity of fish produced per farm ranges from 4 to 400 kg per annum. A majority of them (60%) sourced for fingerlings from the Government hatchery that has been subsidized for and the feed used ranged from kitchen waste to pelleted feeds of commercial source.

This paper aims at studying the level of involvement of the people of Akure South Local Government Area in the management and profitability of homestead fish farming.

Study Area: The study was carried out in Akure South Local Government Area (LGA) of Ondo State. This LGA was carved out of the defunct Akure LGA. Ifedore, Idanre, Owo and Akure North Local Government Areas surround the LGA. It has an area of 2,303 k m^2. It is situated 205km east of Ibadan, the capital of Oyo state, 346km northeast of Lagos state, which is the commercial capital of the Federal Republic of Nigeria. With a population of 283,300 people from the 1991 census, the Local Government has the following major towns- Akure and Oda. Other villages are Aponmu, Awule, Olokuta, Iwoye, Ipinsa, Ijoka, Emiloro, Ifekun, Isagba and a host of others.

The Local Government Area is situated almost at the center of the state making it easily assessable to all people of the state and the headquarters, Akure doubles as the state capital. The markets in Akure metropolis are on daily basis while that of other towns and villages are periodic.

Sampling Technique: Multistage sampling technique was used, which deals with the selection of the sample on a combination of two or more sampling methods. This multistage sampling technique consists of non-probability and probability sampling techniques. The non-probability method used was the purposive sampling method and the probability sampling method used was the simple random sampling method. For this study, 80 homestead fish farms were selected and sampled.

Data Collection: Data used in this study were collected from two main sources, primary and secondary. The primary data were collected through the use of structured questionnaire. Personal visit/contact with the fishpond owners helped not only in getting the questionnaire administered but also in obtaining relevant information. Only 55 copies of questionnaire were retrieved for processing. Secondary data were obtained from fisheries extension workers of the Ondo State Ministry of Agriculture and Natural Resources, Akure. Relevant data and information were obtained from the results of summary of fish ponds/farms in Ondo State as compiled by the State Department of Fisheries.
After the interviews, completed copies of questionnaire were checked and answer codes verified.

Materials and Methods

The study used both qualitative and quantitative techniques to analyze the data collected. The qualitative method included the use of frequency tables, means, standard deviation, percentages, minimum and maximum values. The quantitative method included the budgeting analysis and the regression frontier model.
The Gross Margin (GM) was employed to estimate the profitability of homestead fish farming in the study area. The GM is the difference between the Total Revenue (TR) and the Total Variable cost (TVC). It is expressed mathematically thus:

$$GM = TR - TVC$$

A GM greater than zero indicates a profitable enterprise.
The econometric model specification used in this study was the regression model, which was used to estimate the technical efficiency of the homestead fishpond farmers. The model was specified to determine the relationship between output level and other variables and its production function is defined as:

$$\text{Log } Y = b_0 + b_1 \text{log} x_1 + b_2 \text{log} x_2 + b_3 \text{log} x_3 \ldots\ldots\ldots B_6 \text{log} x_6 + E$$

Where:
Y = dependent variable (quantity)
$b_1 - b_6$ = regression coefficients
b_0 = constant term
X_1 = age
X_2 = sex
X_3 = household size
X_4 = education
X_5 = occupation
X_6 = years of experience
E = error term

Results

This will be presented in two sections.
Section 1 presents factors contributing to efficiency of fish farmers.

Table 1: Sex distribution of respondents

Sex	Frequency	Percentage
Male	46	83.6
Female	9	16.4
Total	55	100.0

Source: Field Survey, 2004

Table 2: Age distribution of the respondents

Age (years)	Frequency	Percentage
21-30	4	7.3
31-40	19	34.5
41-50	15	27.3
51 and above	17	30.0
Total	55	100.0

Source: Field Survey, 2004

Table 3: Household size

Household size	Frequency	Percentage
1-5	5	9.1
6-10	35	63.6
11-15	8	14.5
16-20	4	7.3
20 and above	3	5.5
Total	55	100.0

Source: Field Survey, 2004

Table 4: Educational Background

Educational Level	Frequency	Percentage
No formal education	0	0.0
Primary	2	3.6
Secondary	24	43.6
Post Secondary	10	18.2
Adult	5	9.1
Others (specify)	14	25.5
Total	55	100.0

Source: Field Survey, 2004

Table 5: Occupational distribution

Occupation	Frequency	Percentage
Crop farming	14	25.5
Civil servant	17	30.9
Business	14	25.5
Others (specify)	10	18.2
Total	55	100.0

Source: Field Survey, 2004

Table 1 presents the sex distribution of respondents. It was observed that 83.6% of them were males while the remaining 16.4% were females. This shows that males are more involved in homestead fish farming than females, which might be due to the fact that fish farming is both labour and capital intensive.

From Table 2, it was observed that there were more respondents in the age bracket of 31-40 years (34.5%) and on the whole, 69.1% of them were below the age of 51. This implies that majority of the respondents were young and of average age, which would enhance their efficiency in that they are active and agile to work on the farms themselves. They also will accept new technologies readily to enhance their productivity.

Table 3 presents the household size of respondents showing that 63.6% of them had household size of between six and ten people. This family size would ensure more hands on fishpond and the necessity of having the fishpond in the first instance, to augment protein supply as well as cash at hand.

The study revealed that the level of education of the respondents was high as shown in Table 4. About 96.4% of them had minimum of secondary school education. The literacy level of the sampled farmers in the study area had positive impact on the receptiveness of the farmers to the adoption of new technology. Therefore, the higher the level of a farmer's education, the better his decision making ability, especially, in the adoption of new innovations.

An analysis of the major occupational distribution of the fish farmers in the study area is given in Table 5. The table shows that 30.9% of them were civil servants while 51% of them were either crop farmers or into business. Another 18.2% of the respondents were into produce buying, brick layering and other forms of enterprises. The respondents were part-time fish farmers, which had negative effect on their productivity, because they were not always there to

Table 6: Regression analysis

Descriptive statistics	Mean	Standard deviation	Frequency
Qty of fish produced kg	139.11	126.69	55
Age	3.82	0.96	55
Sex	1.16	0.37	55
Household size	2.36	0.95	55
Education	10.64	4.88	55
Years of experience	112.56	7.28	55

Source: Field Survey, 2004

monitor their fish and the ponds.

Section 2: presents the regression analysis of homestead fish farming.
The descriptive statistics of respondents is shown in Table 6. It gives a breakdown of the quantity of fish produced and the major factors that support homestead fish farming.
All the above variables have perfect correlation with the quantity of fish produced, that is, they all had value less than unity but greater than zero.
Model Summary i.e. R^2. Table 7 presents the R^2 of the study. The dependent variable (Y) is partly explained by the independent variables X_1 - X_6.

Table 7: Pearson Correlation

Pearson Correlation	Qty of fish produced (kg)
Qty of fish produced (kg)	1.000
Age	0.189
Sex	0.269
Household size	0.321
Education	0.175
Occupation	0.043
Years of experience	0.197

Source: Field Survey, 2004

Y = Dependent variables
$b_1 – b_6$ = regression coefficient
b_0 = constant term
$X_1 – X_6$ are the independent variables. This ranged from age to years of experience.
E = error term
$Y = 155.356 + 1.079X_1 + 75.425X_2 + 35.732X_3 + 0.110X_4 + 5.383X_5 + 0.594X_6$
The significant level of this expression is greater than 0.05. Since the R^2 is 0.715, it means that 71.5% of the variation in Y is jointly explained by $X_1 – X_6$. The goodness of fit is quite high as the value of R^2 is above average. This is presented in Table 8.

Table 8: Model Summary

Model	R	R^2	Adjusted	Error
1	0.839[a]	0.715	0.705	123.62

Predictors:(Constant), Years of experience, Occupation, Household size, Sex, Education, Age
Source: Field Survey, 2004

Profitability of the Enterprise: Gross margin of the enterprise determine the profit margin of homestead fish farm holders, this is the difference between the total revenue and total variable cost.
Gross margin (GM) = TR – TVC
TR = Total revenue
Where TR = PQ and
P = product price/kg
Q = quantity of fish sold

TVC = Total variable cost
TR/producer = TR/N
N = Number of respondents
TVC = 1,001,750
N = 55
Therefore, TVC/producer = TVC/N

$$= \frac{1,001,750}{55}$$

= N18, 213.64

Total sale of fish/producer = $\frac{3,470,550}{55}$

= N63, 100.91

GM/producer = TR – TVC
= 63,100.91 – 18,213.64
GM = N44, 887.27 per annum.

GM/month = $\frac{44,887.27}{12}$

GM = N3, 740.61 per month.

Conclusion

It is evident from the above that homestead fish farming is profitable, both in terms of protein availability and cash at hand from sale of excess cropped fish, which has a ready market.
Homestead fish farmers should source their fingerlings from reputable hatcheries.
Fish farmers could utilize the re-circulatory system, which though more expensive, reduces the amount of space and employs more stocking rate than the old pond system.
Government should encourage fish farmers by the provision of fingerlings at subsidized rates and provision of extension services.

References

Anyanwu, P.B., B. Ezenwa and P. Uzukwu, 1987. Studies on homestead pond programme in Lagos State. In NIOMR, Annual Report, pp: 19-20
Ezenwa, B. and P. Uzukwu, 1989. Fish farmers' guide.
Fagbenro, O.A., 1987. A review of biological and economic principles underlying commercial fish culture in Nigeria. J. West African Fisheries, pp: 171-177
FAO., 1999. Fisheries statistics, 1998
Satia, B.P., 1990. National Review for Aquaculture Development in Africa, Nigeria. FAO Fisheries Circular No 770.29 FAO, Rome, pp: 193