Monetary practicality for the utilization of microfinance bank loan on improvement of aquaculture in Nigeria

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Abstract

This study examined the economic viability of the use of microfinance bank loan on aquaculture development in Ogun state, Nigeria. The simple random sampling technique was used in selecting eighty aquaculturists that provided the primary data used in this study. The primary data were collected with the aid of well-structured, validated and pre-tested sets of interview schedules, administered through personal interviews and observations, so as to elicit the required information from the targeted loan users and were analyzed using descriptive, budgetary analyses and profitability ratios. Results showed a mean age of 47 and 43 years for beneficiaries of microfinance bank loan and non-beneficiaries respectively, while 57.5 and 42.5% had secondary education and an average household size of 5 persons, their vast experience in fish farming (13 and 12 years) has been a facilitating factor in productivity improvement in the localities. Gross margin of N27,461.48 and N59,030.31; benefit cost ratio of 1.58:1 and 6.9:1 shows that, aquaculture was profitable and viable. Findings concluded that, aquaculture is a profitable business with a high return on investment; therefore adequate policies should be made to ensure that the interest rate is subsidized for increase in the supply of animal protein source.

Keywords: Economic viability, microfinance bank loan, aquaculture development, Nigeria.

INTRODUCTION

Nigeria, like many other developing countries of the world is faced with the task of meeting the protein demands of her ever- increasing human population (Tijani, 2004). According to the Food and Agricultural Organization of the United Nations, Nigeria is a protein-deficient country. The protein deficiency in the diets can be primarily remedied through the consumption of either protein-rich plant or animal sources. Protein from animal source is in short supply in Nigeria just as increases in livestock population is being limited by several factors such as; virus diseases, drought, scarcity, ban on importation of animal product and high cost of feeds. Other factors include low genetic potentials and short supply of domestic breeds, as well as increase in human population. These factors combined, have raised the cost

of animal protein to a level almost beyond the reach of the low income group. This situation therefore has given rise to a considerable increase in the demand for fish to supplement animal protein source (CBN/NISER, 1992).

Fish is therefore a major source of animal protein and an essential food item in the Nigerian diet. The failure of domestic fish production to keep pace with domestic consumption had in the past led to massive importation, to bridge the supply gap with a resultant foreign exchange drain on the economy. However, the long-term solution to the domestic supply gap lies in boosting domestic production through aquaculture practices (Aihonsu, 2001). Beyond the domestic consumption, developing the domestic production could enable the country to explore the huge international market for fish and fish products. The contribution of the aquaculture

sector to the Nigerian economy is quite significant. Fish is said to supply 40% of the total dietary protein consumption in Nigeria (Areola, 2007). It occupies a strategic position in the nation's food security, income and employment generation, foreign exchange earning, poverty alleviation and manpower development (Dada, 2004; Areola, 2007).

Aihonsu (2001) stressed further that in developed countries, credit has been used as a means to improve farmer's efficiency and accelerating aquacultural productions. To this end, inadequate flow of funds (loans) into aquaculture has been identified, as a critical factor in accelerating incremental fish production in Nigeria (Olieh, 1980). While to Kherallah et al. (2000) lack of access to loan and adequate working capital is a significant barrier to further expansion of aquaculture development. Although, economic analysis of aquaculture practices in Ogun state has revealed fish production to be generally profitable (Aihonsu, 2001) the profit cannot be maximized if there are no adequate loan or capital for the effective monitoring of the lucrative aquaculture business. Loan has been established to affect farmers' investment behaviour and productivity. However, there is presently no adequate basis to suggest that, credit or loan use has positive or negative influence on farm productivity in Nigeria. Most of the credit studies in the country were concentrated at understanding society demographic and economic factors that influence the supply and demand for credit in the economy (Okoruwa and Oni, 2001; Okunade, 2007).

To bridge this gap in knowledge, this paper empirically accesses the cost and returns of microfinance loan on fish raising. It is against this backdrop that, this study aims to examine the productivity, output, profit level, and benefit cost ratio of the beneficiaries and non-beneficiaries of microfinance bank loan in Ogun State, Nigeria.

Objectives of the study

The broad objective is to access the economic viability for the use of microfinance bank loan on fish farming in the study area. The specific objectives are to:

1. Describe the socio-economic characteristics of the fish farmers;
2. Compare the profit level and other parameters of non-beneficiaries to the beneficiaries of microfinance banks loans using the profitability ratios;
3. Determine the constraint faced by fish farmers in securing the microfinance bank loan.

The study hypothesized that there is no significant difference between the profit level of the beneficiaries and non-beneficiaries of microfinance banks loan users and there is no significant relationship between constraint faced by farmers in the demand for microfinance banks loan and aquaculture development.

METHODOLOGY

Study area

The study was conducted in Ogun State with Abeokuta as the state capital and consists of twenty local government areas. The state covers an area of about 16,409.265 Km^2 (Ayinde et al., 2002) with an estimated population of over 3 million people (NPC, 2006). The study covered the whole four agricultural extension zones as classified by the Ogun State Agricultural Development Programme (OGADEP) based on ecological views for effective, adequate and complete improved technologies dissemination (Olaoye et al., 2007).

The four zones are Ikenne, Ilaro, Ijebu-ode and Abeokuta zone located in southwestern Nigeria, that are well known as best ecological suitable areas for fish production and hence, the state is referred to as the basket of fish for the nation because of abundance of wetland with annual growth rate of 3% per annum. As at 2008, farmed fish produced by 6,664 productive fish farmers was found to be synchronous with the growth trend of aquaculture and the resources in Ogun State within the same period (OGADEP, 2008; Olaoye, 2010).

Data collection and sampling technique

Clustered sampling method was used by selecting blocks and circles in each zone based on higher number of microfinance loan beneficiaries. Productive fish farmers that benefited from microfinance bank loan were purposively selected from all the zones to give a total of 40 beneficiaries. 40 non-beneficiaries respondents were also selected using simple random sampling technique.

Method of data analysis

Data collected were analyzed with the use of descriptive analysis, budgetary technique and profitability ratios. Frequency and percentages, tables, mean and mode were used to describe the data collected on the socio-economic characteristics of the respondents. The budgetary technique (economic indicator) was used to determine the gross margin income of farmed fish by aquaculturist cultured by both beneficiaries and non-beneficiaries of the project using t-test for two sample assuming unequal variances. Model used in estimating the gross margin is:

$$GMI = \sum TR - \sum TVC \text{ --- (i)}$$

$$TR = Py. Yi \text{ -- (ii)}$$

$$TVC = Px.X \text{ --- (iii)}$$

$$TC = TVC + TFC \text{ -- (iv)}$$

$$NFI = GM – TFC \text{ -- (v)}$$

Where, GMI = Gross Margin Income (N)
TR = Total Revenue (N)
TVC = Total Variable Cost ((N)
TC = Total Cost (N)
NFI = Net Farm Income (N)
Py = Unit Price of Output Produced (N)
Y = Quantity of Output (Kg)
Pxi = Unit Price of Variable input used (N)

Xi = Quantity of Variable Input (Kg).

RESULTS AND DISCUSSION

Socio-economic characteristics of fish raisers in Ogun State, Nigeria

Results in Table 1 show that, majority of all the beneficiaries and non-beneficiaries sampled, were between the age of 41 and 50 years. Thus, the average age was 46.8 and 43.4 years which implies they were highly productive and active to undertake strenuous task associated with farm work (Olaoye, 2010). This is in line with the assertion of Bello (2000) that age has positive correlation with acceptance of innovations and risk taking as implicit in the credit borrowing for agricultural production. The ratio of the male to female for beneficiaries and non-beneficiaries were 28:12, 27:13. This is a throwback to the traditional belief on women access to productive resources of which credit is one; this is however contrary to Lahai et al. (2000), which seem to suggest that women participate more than men in most farming activities.

Most (75 and 80%) of beneficiaries and non-beneficiaries, respectively were married. The implication was that these figures were expected to enhance the use of more family labour in the fish farming operations, thereby leading to reduction in the use of hired labour among in the study area. Education is an important factor which can influence farm productivity and determine farmer's access to loan and repayment, level of education according to the study showed that, over 95 and 90% of beneficiaries and non-beneficiaries, respectively have one form of education or the other. This is contrary to the general opinion that, most farmers are illiterates or semi-illiterates; most of whom have dropped out of the formal school system, as evidence from the studies of Ozor (1998) and Okwoche et al. (1998).

From the results, one can also infer that Christianity was mostly practiced than any other religion as a majority [62.5, 55%] of the benefiting and non-benefiting fish farmers respectively were Christians. The average household size in the locality was found to be 5 persons for both beneficiaries and non-beneficiaries. The implication is that, the relatively small household size may increase the number of labour needed as against the findings of Adegbite and Oluwalana (2004) and Adegbite et al. (2008); that the larger the household size, the more the likelihood of sustainable labour efficiency on farmer's farm given the constant labour. The respondents' mean fish farming experience showed 13 and 12 years for beneficiaries and non-beneficiaries respectively. Fish farming as the major occupation is a function of the importance attached to it as a source of livelihood. 65% of the beneficiaries and 52.5% of the non-beneficiaries, had fish farming as their major occupation and thus, likely to commit more number of hours, efforts

and loans towards the success of the farm enterprises.

The cooperative society helps farmers to pool their resources, to have access to fisheries inputs and to have insights in their fishing issues. Membership of cooperatives is therefore a factor which influences the adoption of improved fisheries technologies and poverty alleviation. 87.5% of the beneficiaries were cooperators while 62.5% of the non-beneficiaries were not in any cooperative society, which may be the reason for not benefiting from any source of loan. This was in line with the position of Akinbile (1998) that groups ensure that members derive benefits from the groups such that they will not have derived individually, if they were acting alone.

Fisheries credit package

Entries in Table 2 and Figure 1, shows the loan benefited from the microfinance banks in Ogun State, Nigeria by sampled fish farmers' beneficiaries. The kinds of loans disbursed to fish farmers' shows that 27.5% were in kind, only 7.5% were in cash while the remaining 65% were both in cash and kind, this may be a means of monitoring the use of the released loan. Forty percent (40%) were granted loan of between N100,001 and N150,000, while 20 and 15% received between N150,001 and N200,000 and N50,001 and N100,000, respectively. The availability of credit facility to farmers is expected to boost fish productivity, if it is utilized judiciously. One of the set back in the loan is the relatively high interest rate complained by the beneficiaries, 75% said they paid well over N10,000 on the granted loan.

Cost and return analysis

The farm budget analyses carried out to assess the profitability of the fish farming enterprise were shown in Table 3. The table revealed that the proportion of variable cost was higher than that of fixed cost, the variable cost accounted for 96.18 and 79.26% of the total cost, while fixed cost was found to be 3.82 and 20.7% for the beneficiaries and non-beneficiaries, respectively. The cost items include, cost of fertilizer, purchase or rent of land, construction of ponds or tanks among others.

Furthermore, the variable cost indicate that feed had the highest operating expenses (73.45 and 29. 21%), this was followed by expenses on purchase of fish seeds (6.4 and 16.6%), transportation (2.8 and 8.7%), labour (3.6 and 0.48%) and land preparation (0.5 and 6.97%) for the beneficiaries and non-beneficiaries, respectively in decreasing order. The relatively high cost of feeding was based on the fact that, fish farming emphasizes on bringing a fish to table size at the shortest possible time. From the foregoing, fish farming was found to be a productive and lucrative enterprise in Ogun State, there was on average a profit margin of 57,080.64 and

Table 1. Percentage distribution of fish farmers' socio-economic characteristics.

Parameters	Beneficiaries		Non-beneficiaries	
Age (Years)	Frequency	Percentages	Frequency	Percentages
21-30	0	0.0	4	10.0
31-40	6	15.0	9	22.5
41-50	25	62.5	18	45.0
51 and above	9	22.5	9	22.5
Mean		46.8		43.4
Total	40	100.0	40	100.0
Marital status				
Single	4	10.0	6	15.0
Married	30	75.0	32	80.0
Divorced	4	10.0	1	2.5
Widow	2	5.0	1	2.5
Total	40	100.0	40	100.0
Sex				
Male	28	70.0	27	67.5
Female	12	30.0	13	32.5
Educational level				
Primary school completed	1	2.5	3	7.5
Primary school uncompleted	1	2.5	1	2.5
Secondary school completed	23	57.5	17	42.5
Secondary school uncompleted	2	5.0	4	10.0
Tertiary school completed	11	27.5	9	22.5
Tertiary school uncompleted	2	5.0	6	15.0
Total	40	100.0	40	100.0
Religion				
Christianity	25	62.5	22	55.0
Islam	14	35.0	16	40.0
Tradition	1	2.5	2	5.0
Total	40	100.0	40	100.0
Household size				
0-3	8	20.0	8	20.0
4-6	26	65.0	24	60.0
7-9	5	12.5	8	20.0
10 and above	1	2.5	0	0.0
Mean		5.0		5.0
Total	40	100.0	40	100.0
Fish farming experience				
0-5	3	7.5	14	35.0
6-10	16	40.0	7	17.5
11-15	11	27.5	13	32.5
16-20	3	7.5	4	10.0
21-25	5	12.5	2	5.0
26-30	1	2.5	0	0.0
31 and above	1	2.5	0	0.0
Mean		13.0		12.0
Total	40	100.0	40	100.0

Source: Field survey, 2009.

Table 2. Percentage distribution of the fish farmers' demand of micro-finance bank loan.

	Beneficiaries		
	Freq	%	Mode
Timely release of loan			
Yes	28	70	
No	12	30	
Total	40	100	
Form of loan			
Kind	11	27.5	
Cash	3	7.5	
Both	26	65.0	
Total	40	100	
Grace period			
Yes	9	22.5	
No	31	77.5	
Total	40	100	
Amount approved (N)			
< 50,000	4	10.0	
50,001-100,000	6	15.0	
100,001-150,000	16	40.0	
150,001-200,000	8	20.0	
200,001-250,000	4	10.0	
250,001 and above	2	5.0	
Total	40	100	150,000.00
Interest rate			
<4,999	2	5.0	
5,000-9,999	1	2.5	
10,000-14,999	11	27.5	
15,000-19,999	11	27.5	
20,000-24,999	8	20.0	
25,000 and above	7	17.5	18,000:00

Source: Field survey, 2009.
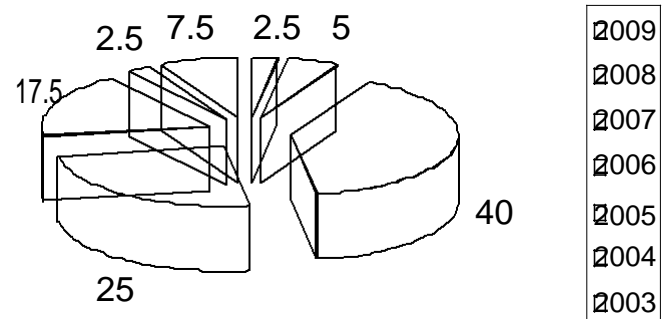
When loan was taken

Figure 1. Pie chart representation of the fish farmers' year of loan obtained

Production efficiency per respondents = Total Revenue/Total Cost

N (70,000/44,227.50) (65,594.80/9,499.17)
   1.58: 1   7: 1

This was a very high efficiency of production, since it was far above 1: 1 which was the break-even point where profit was zero for both beneficiaries and non-beneficiaries.

Profitability ratio

Benefit Cost Ratio = TR/TC   TR/TC
       70,000/44,227.50 65,594.80/9,499.20
             1.58   6.9

Rate of Return (ROR) = NR/TC   NR/TC
       25,772.50/44,227.50 56,145.60/9,499.20
             0.58   5.9

Expense Structure Ratio (ESR) = FC/TC   FC/TC
       1,689.50/44,227.50 1,969.70/9,499.20
             0.038   0.208

Net Profit Margin (NPM) = NR/TR   NR/TR
       25,772.50/70,000 56,145.60/65,594.80
             0.37   0.86

The BCR of 1.58:1 and 6.9:1 shows that fish farming was profitable, rate of return to capital investment was also found to be high, the ROR to investment was 58 and 600 % (that is on every N1 invested, 58K and N6.90 is being returned) for the beneficiaries and non-beneficiaries respectively, this was found to be as a result of high

N25,763.48 for the non-beneficiaries and beneficiaries of microfinance bank loan per fish farmer respectively, this was explained by the result of net return and profit calculated (Table 5). The rate of return per sampled fish farmers was found to be 58 and 60% which was very high; this very high rate of return for the non-beneficiaries compared to the beneficiaries may be due to relatively high interest rate associated with the obtained loan.

The gross margin explains the concept of consumable income, thus 27,461.98 and N59,050.31 for the beneficiaries and non-beneficiaries was the consumable income of producers after each production cycle, which was the net difference between input and output. The cost and return was further analyzed, through the measure of efficiency as indicated below:

Table 3. The cost element of the fish farmers'.

Items	Beneficiaries		Non-beneficiaries	
	Amount N	% of total cost	Amount N	% of total cost
Variable cost				
Lime	1,780.00	0.10	4,186.70	1.10
Fertilizer/manure	5,266.87	0.30	1,342.31	0.35
Land preparation	8,871.43	0.50	26,500.00	6.97
Transportation charges	49,625	2.80	33,071.05	8.70
Fish feeds	1,299,364.00	73.45	111,000.00	29.21
Fish seeds	113,333.00	6.40	63,017.26	16.6
Labour	63,725.00	3.602	1,812.50	0.48
Others	159,556.00	9.019	66,250.00	15.90
TVC	1,701,521.00	96.18	301,179.80	79.26
Fixed cost				
Land rent	3,570.34	0.20	3,850.21	1.01
Water pump	5,969.19	0.34	2,392.53	0.63
Tank construction	6,000.64	0.34	9,162.21	2.41
Pond construction	4,879.11	0.28	6,616.68	1.74
Plumbing	2,641.07	0.15	3,707.15	0.97
Deep well	8,200.98	0.46	7,071.79	1.86
Water component	5,053.82	0.29	6,352.52	1.67
Shed	17,121.71	0.96	20,975.00	5.62
Drag net	2,332.81	0.13	2,136.55	0.51
Cutlass and file	466.78	0.03	810.20	0.30
Weighing scale	2,217.79	0.13	1,771.80	0.47
Generator and fuel	5,973.51	0.34	11,947.26	3.14
Net fencing	1,935.96	0.11	1,100.68	0.29
Bowls /bucket	1,214.04	0.07	893.26	0.24
TFC	67,579.70	3.82	78,786.90	20.7
Total cost	1,769,100	100	379,966.70	100
Total income	2,800,000		2,623,792.00	
Gross margin	1,098,479.00		2,322,612.20	
NFI	1,030,899.30		2,243,825.30	
BCR	1.58:1		6.9:1	
ROR	0.58		5.9	
ESR	0.038		0.208	
NPM	0.37		0.86	

Source: Field survey, 2009.

management and personal labour, that is employed in the business. The expense structure ratio of 0.038 and 0.208 for the beneficiaries and non-beneficiaries implies that, about 3.8 and 20.8% of the total cost of production is made up of the fixed cost; this was in line with Table 2. 0.37 and 0.86 values of the net profit margin implies profit margin of 37 and 86% for the beneficiaries and non-beneficiaries for producers after each production cycle.

Constraint to procurement of microfinance bank loan among fish farmers

The fish farmers were facing certain problems in the study area that are adversely affecting this highly productive business, some of the constraints facing aquaculture industry hindering its developments include; lack of sufficient fund, majority of the farmers still depend on money lenders or micro lending from several financial institutions in the study area (Table 4).

CONCLUSION AND RECOMMENDATION

From the findings of the study, it may be concluded that aquaculture is a profitable business with a high return on investment; therefore adequate policies should be made

Table 4. Constraint to procurement of loan by fish farmers.

	Beneficiaries					
	Very serious		Serious		Not a problem	
	Freq	%	Freq	%	Freq	%
High interest rate	36	90.0	4	10.0	0	0.0
Inadequate credit	33	82.5	6	15.0	1	2.5
Repayment time	26	65.0	14	35.0	0	0.0
Amount of loan obtained	27	67.5	13	32.5	0	0.0
Late approval	15	37.5	19	47.5	6	15.0
Distance of agency	1	2.5	21	52.5	18	45.0
Bottleneck	2	5.0	22	55.0	16	40.0
Guarantor	13	32.5	21	52.5	6	15.0

Source: Field survey, 2009.

Table 5. Profitability indicators.

	Beneficiaries	Non-beneficiaries
The Gross income/fish farmer	N70,000	N65,594.80
Net Return (NR) fish farmer	N(70,000 – 44,227.50)	N(66,594.80 – 9,499.17)
NR	N 25,772.50	N57.095.63
Gross Margin (GM)/respondents	TR–VC N(70,000 – 42,538.03) N27,461.98	TR -VC 66,594.80 – 7,544.50 59,050.31
Profit/respondent	GM–FC N (27,461.98 – 1,698.50) N25,763.48	GM-FC N59,050.31– 1,969.67 N57,080.64

to ensure that the interest rate is subsidized for increase in the supply of animal protein source. From the study,the following are recommended:

1. Government should increase the amount of loan that is allocated to the agricultural sector and invariably the fisheries sector.
2. Credit should be made available from other sources and even the non-governmental organization, at a very low interest rate and the bank should package a reasonable amount to be disbursed to farmers for increased production.

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