Contribution of fish farming to the socio-economic status of fish farmers in Oyo State, Nigeria

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ABSTRACT

This study determined the contribution of fish farming to the socio-economic status of fish farmers in Oyo State. A multistage sampling procedure was used to select the respondents resulting in a total number of 120 fish farmers used for this study. The primary data for this study was collected using an interview schedule which was analyzed using descriptive and inferential statistics. Results revealed that the major constraint to fish farming was lack of access to credit facilities and the contribution of fish farming to the socio-economic status of fish farmers was high. At 0.05 level of significance, significant relationships exist between the respondents age (r=0.389, p=0.004), household size (r=0.286, p=0.002), years of experience (r=0.298, p=0.001), benefits (r=0.279, p=0.002) and their socio-economic status. Chi-square analysis of the result shows that there was significant relationship between marital status (χ^2=5.835, p=0.023) and socio-economic status. Based on these findings, the study recommended that credit facilities should be made available to fish farmers and conventional feeds should be available to users at a reduced rate.

Introduction

There is increasing demand for fish products worldwide which has resulted in the growth of fish farms to meet a substantial part of the world's food requirement (FAO, 2007). Fish farming is predominantly an extensive land-based system practiced majorly at the small-scale subsistent level in Africa (Anyawu, 2005). Fagbenro (2005) also reported that in Nigeria, large-scale commercial fish farming is yet to become widespread with most fish farmers operating small-scale fish farm enterprises ranging from homestead concrete ponds (25 to 40 m) to small earthen ponds (0.02 to 0.2 ha). Jagger and Pender (2001) also opined that fish farming is uniquely placed to reverse the declines in supplies experienced from capture fisheries and has notable potentials for new livelihood opportunities, providing a mechanism for lower-priced fish,

enhanced nutritional security and employment for poor communities. Nwafili and Tianxiang (2007) also reported that out of the estimated 120 million people in Nigeria in 2000, about one percent engages in fishing and over 24 million Nigerians depend on fisheries for their livelihood.

Fish farming has the potential to help expand the resource base for food production and reduce the pressure on conventional sources of fish which are harvested faster than they can be regenerated, for developing countries like Nigeria where the economy is largely agrarian, fish farming can generate significant employment and enhance the socio-economic status of the farmer as well as generate foreign exchange (Oluwasola & Ajayi, 2013). Goswami and Sathiadhas (2000) stated that community fish farming played a significant role in the socio-economic status of villagers. It is against this background that the contribution of fish farming to the socio-economic status of fish farmers in Oyo state was embarked upon.

The general objective of the study was to determine the contribution of fish farming to the socio-economic status of fish farmers in Oyo state while the specific objectives of the study were to;

1. describe the socio-economic characteristics of fish farmers.
2. determine the enterprise characteristics of fish farming.
3. examine fish farmers' involvement in fish farming activities
4. ascertain the benefits fish farmers derived from their involvement in fish farming.
5. determine the contributions of fish farming to the socio-economic status of fish farmers.
6. identify the respondents' constraints to fish farming.

Materials and Methods

The study was carried out in Oyo state which covered approximately an area of 28,454 square kilometers and is ranked 14th by size. The landscape consists of old hard rocks and dome-shaped hills, which rise gently from about 500 meters in the southern part and reaching a height of about 1,219 meters above sea level in the northern part. The climate is equatorial, notably with dry and wet seasons with relatively high humidity. The dry season lasts from November to March while the wet season starts from April and ends in October, average daily temperature ranges between 25°C (77.0°F) and 35°C (95.0 °F), almost throughout the year. Multistage sampling procedures were used to select the sample size for this study. The first stage involved a simple random selection of 20% of 33 local government areas of Oyo state while the second stage involved the disaggregation of fish farmers into registered fish farmers and unregistered in the selected local government areas in another stage which involved a simple random selection of 40% of the 150 registered fish farmers in the selected local government areas obtained from the zonal office of the Oyo state agricultural development programme. Also, the list of the equivalent unregistered fish farmers in selected local government areas was generated using the snowball technique and 40% of the unregistered fish farmers were randomly selected which made up 60 respondents. Therefore, the total sample size used for the study was 120 respondents.

Data collection, analysis and measurement of variables

Data for the study were obtained through the use of interview schedule. Descriptive and inferential statistics were used to analyze the data. The descriptive statistics involved the

use of frequency, percentage while inferential statistics involved the use of chi-square and PPMC (Pearson Product Moment Correlation).

The independent variables for this study include socio-economic characteristics, enterprise characteristics, fish farmer's involvement in fish farming, benefits of fish farming, constraints to fish farming while the dependent variable is socio-economic status. Socio-economic characteristics were ascertained by asking the respondents to indicate their age, sex, marital status, level of education attained and income. Enterprise characteristics of the respondents were elicited by asking them to indicate their source of labour, source of finance, years of farming experience, training on fish farming, types of pond used, pond stocking capacity, numbers of pond own, fish varieties, method of land acquisition. Fish farmers' involvement in fish farming activities was measured by asking the respondents to indicate their degree of involvement in fish farming activities such as always involved, occasionally involved and not involved with the assigned numbers of 1, 2, 0 respectively. The benefits fish farmers derived from fish farming were measured by asking them to indicate the level of benefits from information provided whether it is high, slight and not a benefit with the assigned numbers of 1, 2, 0. With regards to constraints to fish farming, the respondents were asked to indicate their constraints and its degree whether it is major, minor and not a constraint on the basis of information provided.

Socio-economic status (dependent variable) was measured by using the scale constructed by Ovwigho (2000). This was measured based on the possession of items and quantity for continuous items as a result of fish farmer involvement in fish farming, however, there is an indication of "YES" for possession of items and "NO" for non possession of items that are categorical among the respondents.
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Results and Discussion
Respondents' socio-economic characteristics
Age distribution as presented in Table 1 shows that 46.7% of the respondents were between the ages of 31 and 40 years and 23.3% of them were between the ages of 41 and 50 years. The implication of this result indicated that most of the respondents (46.7%) were in their productive years with the hope to better or improve their socio-economic condition. This result is consistent with Adewuyi *et al.* (2010) from their studies on the analysis of profitability of fish farming in Ogun state. Also, the majority of the respondents (80.8%) were male while 19.2% of the respondents were female. This means that males were more involved in fish farming than females which is in agreement with the findings of Adewuyi *et al* (2010). Available data in Table 1 also revealed that 77.5% of the respondents were married, 20.0% of them were single and 2.5% of them divorced. This implies that majority of the respondents were married. On the respondents' religious affiliation, the result also showed that 72.5% of the respondents were Christians, 25.8% of the respondents were Muslims while only 1.7% of them practiced traditional religion. This means that the Christian religion is a popular religion among the respondents. Findings also revealed that 51.7% of the respondents had between 4 and 6 persons in their families and 25.8% of them had between 1 and 3 persons in their families. From these findings, it could be deduced that most of the respondents had significant household size which is likely to have influenced fish farming activities. According to Sule *et al.* (2002), household size has a great role to play in family

labour provision in the agricultural sector. On the level of education of the respondents, 39.2% of them had secondary education and 36.7% of them had tertiary education. This implies that most of the respondents attained level of education that qualified them as literate farmers and as such will improve their knowledge and performance in fish farming activities. This outcome of this finding is consistent with the report of Aromolaran (2000). Further result from the finding in Table 1 also shows the major occupation of the respondents, 35.0% of the respondents were into civil service and 28.3% of them were into teaching. These results signified that most of the respondents took fish farming as part-time jobs which were quite similar to that of the study carried out by Ara (2005). In terms of income realization, 57.5% of the respondents realized between ₦200,001 and ₦300,000 per cropping season.

Level of education		
No formal education	15	12.5
Tertiary education	44	36.7
Primary education	14	11.6
Secondary education	47	39.2
Major Occupation		
Teaching	34	28.3
Trading	23	19.2
Civil service	42	35.0
Artisan	11	9.2
Fishing	10	8.3
Income (₦)/cropping season		
1,000-100,000	1	0.8
100,001-200,000	21	17.5
200,001-300,000	69	57.5
300,001-400,000	23	19.2
400,001-500,000	6	5.0

TABLE 1

Distribution of the respondents according to their socio-economic characteristics

Variables	Frequency	Percentage	Mean
Age	12	10.0	
21-30	56	46.7	1.95
31-40	28	23.3	
41-50	18	15.0	
51-60	6	5.0	
61-70			
Sex	97	80.8	
Male	23	19.2	
Female			
Religion	31	25.8	
Islam	87	72.5	
Christianity	2	1.7	
Traditional			
tHousehold size			
1-3			
4-6	31	25.8	
7-9	62	51.7	1.96
10-11	22	18.3	
	5	4.2	

Enterprise Characteristics of the Respondents

The result of the findings presented in table 2 shows that 53.3% of the respondents used paid labour as the major source of labour in fish farming enterprise with 58.3% of them financing the business through personal saving. On the respondents' years of experience, 56.7% of the respondents had between 1 and 5 years of experience with 77.5% of the respondents had no formal training on fish farming. A substantial proportion of the respondents (65.8%) used earthen pond for their production of fishes which is similar to the finding of Oluwasola and Ajayi (2013) in socio-economic and policy issues determining sustainable fish farming in Nigeria. Also, 41.7% of the respondents had the highest stocking capacity of 600 and above with 63.3% of them owned between 3 and 4 ponds. The commonest variety of fish the

respondents reared was catfish with 89.2% of them engaged in its production while 46.7% of the respondents purchased the land they used for fish farming enterprise.

TABLE 2
Enterprise characteristics of the respondents

Variables	Frequency	Percentage	Mean
Sources of Labour			
Family member	21	17.5	
Paid labour	64	53.3	
Friends	6	5.0	
Self	29	24.2	
Source of Finance			
Personal saving	70	58.3	
Family members	16	13.3	
Friends	3	2.5	
Fish Farmers Association	26	21.7	
Micro finance bank	5	4.2	
Years of experience			
1-5	68	56.7	23.47
6-10	36	30.0	
11-15	7	5.8	
16-20	9	7.5	
Types of pond used			
Earthen	79	65.8	
Concrete	39	32.5	
Tank	2	1.7	
Pond stocking capacity			
200-300	2	1.7	
301-400	14	11.7	
401-500	25	20.8	
501-600	29	24.1	
600 and above	50	41.7	
Number of pond own			
1-2	14	11.7	21.25
3-4	76	63.3	
5-6	30	25.0	
Fish varieties			
Cat fish	107	89.2	
Tilapia	9	7.5	
Common carp	4	3.3	
Method of land acquisition			
Inheritance	12	10.0	
Purchase	56	46.7	
Rent or lease	49	40.8	
Gift	3	2.5	

Fish farmers' involvement in fish farming activities

Available statistics in Table 3 shows the respondents involvement in fish farming activities such as feeding of fish (mean value = 1.875), procurement of feed (mean value = 1.442), collection of matured fish (mean value = 1.358), stocking of fingerlings (mean value = 1.293) and sorting (mean value = 1.18). Conversely, respondents were not mainly involved in checking temperature, spawning, and use of chemicals with mean values of 0.666, 0.725 and 0.816 respectively.

TABLE 3
Fish farmers' involvement in fish farming activities

Variable	Never		Occasionally		Always		Weighted scores	Mean	Rank
	F	%	F	%	F	%			
Spawning	49	40.8	55	45.8	16	13.3	87	0.725	10TH
Sorting	10	8.3	78	65.0	32	26.7	142	1.183	5TH
Procurement of feeds	8	6.7	51	42.5	61	50.8	173	1.442	2ND
Stocking of fingerlings	9	7.5	67	55.8	44	36.7	155	1.293	4TH
Treatment of water	22	18.3	69	57.5	29	24.2	127	1.058	8TH
Checking of temperature	57	47.5	46	38.3	17	14.2	80	0.666	11TH
Feeding of fish	3	2.5	9	7.5	108	90.0	225	1.875	1ST
Use of chemical to control diseases	34	28.3	74	61.7	12	10.0	98	0.816	9TH
Removal of waste matter	19	15.8	70	58.3	31	25.8	132	1.100	7TH
Collection of matured fish from pond	8	6.7	61	50.8	51	42.5	163	1.358	3RD
Changing of water	22	18.3	58	48.3	40	33.3	138	1.150	6TH

Benefits fish farmers derived from fish farming
Table 4 showed that the majority of the respondents with the mean value of 1.80, 1.59, 1.58 and 1.56 benefitted highly from fish farming in terms of provision of income, source of employment, improvement in health status, improvement in social life and improvement in materials possession. The implication of this finding indicated that fish farming brings an improvement in the socio-economic status of the respondents. This finding is corroborated by Edwards (2000) and Engle (2008) who posited that an improvement in the socio-economic status of fish farmers was consequent upon the benefits derived from fish farming.

TABLE 4
Benefit farmers derived from fish farming

Variables	High	Slight	Not a benefit	Mean	Rank
Improve protein in take	69(57.5)	46(38.3)	5(4.2)	1.53	6th
Provide income	99(82.5)	18(15.0)	3(2.5)	1.80	1st
Improve the knowledge of fish rearing	54(45.0)	62(51.7)	4(3.3)	1.41	7th
Serves as source of employment	71(69.2)	49(40.8)	-	1.59	2nd
Food security increase	56(46.7)	37(30.8)	27(22.5)	1.24	8th

Use as collateral for credit	3(2.5)	-	117(97.5)	0.05	10th
Improve materials possession	72(60.0)	44(36.7)	4(3.3)	1.56	5th
Improve health status	79(65.8)	32(26.7)	9(7.5)	1.58	3rd
Improve social life	79(65.8)	32(26.7)	9(7.5)	1.58	3rd
Alternative income source	52(43.3)	5(4.2)	63(52.5)	0.90	9th

Contribution of fish farming to the socio-economic status of the respondents

The socio-economic status of farmers was measured according to the scale developed by Ovwigho (2000). In doing this, the socio-economic status of the fish farmers was measured in terms of the number of items possessed for continuous items and "YES" or "NO" for items that are categorical.

An assigned value of 0 and 1 for possession of items and non possession of items that are continuous and categorical were given and the result of the analysis based on the possession and non possession of items with respect to the quantity for continuous items among the respondents showed that the socio-economic status is high among the respondents with 59.2% and low level of socio-economic status with 40.8% among the respondents with the mean value of 21.88.

Table 5
Contribution of fish farming to socio-economic status

Level of contribution of fish farming to socio economic status	Frequency	Percentage	Mean	Standard deviation	Min	Max
High	71	59.2	21.88	7.77	0.00	32.00
Low	49	40.8				

Constraints to Fish Farming

The study identified the constraints faced by fish farmers. The result in table 6 shows that considered lack of access to credit, (68.3%), high price of conventional feed (52.5%), land acquisition (51.7%) and poor extension services (50.0%), as major constraints. Lack of access to credit as a major constraint in this study is in line with the report of Oluwasola and Ajayi (2013).

TABLE 6
Distribution of respondents according to their constraints

Constraints	Major constraints	Minor constraints	Not a constraints	Weighted score	Mean	Rank
Lack of access to credit	82(68.3)	30(25.0)	8(6.7)	194	1.61	1st
Poor extension services	60(50.0)	45(37.5)	15(12.5)	165	1.37	3rd
Theft	57(47.5)	42(35.0)	21(17.5)	156	1.30	5th
Pollution of water sources	35(29.2)	18(15.0)	67(55.8)	88	0.73	6th
Land acquisition	62(51.7)	39(32.5)	19(15.8)	163	1.35	4th
High price of conventional feed	63(52.5)	40(33.3)	17(14.2)	166	1.38	2nd
Insufficient fingerlings	15(12.5)	43(35.8)	62(51.7)	73	0.60	7th
Inadequate water supply	15(12.5)	17(14.2)	88(73.3)	47	0.39	9th
Disease attack	17(14.2)	24(20.0)	79(65.8)	58	0.48	8th
Mortality of fish	12(10.0)	22(18.3)	86(71.7)	46	0.38	10th

Relationship between respondents socio-economic characteristics and their socio-economic status

The result of chi-square and correlation analysis as shown in table 7 shows that sex (χ^2 =1.515, p=0.220); religion (χ^2= 1.463, p=0.481) were not related to socio-economic status. However, there was a significant relationship between marital status (χ^2=5.835, p=0.023) and socio-economic status. This implies that respondents that are married will have family labour that will serve as support in fish activities.

With regards to the result of correlation analysis, number of ponds owned (r=0.011, p=0.902); pond stocking (r=-0.006,p=0.951) were not significantly related to socio-economic status but household size (r=0.286,p=0.002);years of experience (r=0.298,p=0.001); age (r=0.389,p=0.004) were related to socio-economic status. The implication of household size on the socio-economic status of fish farmers is that the cost that will involve in the use of hired labour will be reduced which may likely increase the income of farmers, however, years of experience will enhance the respondents' practical knowledge of rearing fish which may likely bring about increased in fish productivity. On the respondents' age, as the age increases, years of experience of the respondents increases which will have positive effects on the decision making of the venture that will result in business expansion and consequently have a positive effect on fish productivity and income of the fish farmers.

TABLE 7

Result of chi-square and correlation analysis of the relationship between socio-economic characteristics of the respondents and their socio-economic status

Variables	χ^2	Df	r-value	Cc	p-value	Decision
Sex	1.515	1		0.112	0.220	NS
Marital Status	5.835	2		0.215	0.023	S
Religion	1.463	2		0.110	0.481	NS
Household size			0.286		0.002	S
Years of experience			0.298		0.001	S
Number of pond own			0.011		0.902	NS
Pond stocking			-0.006		0.951	NS
Age			0.389		0.004	S

Result of correlation analysis of the benefits respondents derived from fish farming and their socio-economic status

The result of the analysis in Table 8 shows that there is a significant relationship between the benefits respondents derived from fish farming and their socio-economic status (r=0.279; p=0.002). It implies that the benefits the respondents gained in ventures into the fish farming business led to an improvement in their socio-economic status. Hence as benefits accrued from the business increase, there is a commensurate increase in the socio-economic status of the respondents.

TABLE 8

Result of correlation analysis of the relationship between the benefits respondents derived from fish farming and their socio-economic status

Variable	r-value	p-value	Decision
Benefits	0.279	0.002	S

Result of correlation analysis of the respondents' constraints to fish farming and their socio-economic status

The result of the analysis in Table 9 shows that there is no significant relationship between the respondents' constraints to fish farming and their socio-economic status (r=0.286;p=0.535). The implication of it is that the constraints to fish farming do not have negative effects on the level of socio-economic status of the respondents.

TABLE 9

Result of correlation analysis of the respondents constraints to fish farming and their socio-economic status

Variable	r-value	p-value	Decision
Constraints	0.286	0.535	NS

Conclusion and Recommendation

Based on the empirical finding of the study, it can be concluded that the fish farmers in Oyo state were in their productive age, however, majority of them were male and most of the respondents had 4-6 persons in their family with an average income of ₦250,000.00k per cropping season. The major variety of the fish reared by the farmers was catfish which provide an alternative source of income to them and the activity they engaged mostly in fish rearing was the feeding of fish. The contribution of fish farming to the socio-economic status of fish farmers was high, however, the major constraint of fish farming was lack of access to credit facilities. A significant relationship existed between the respondents' age, years of experience, household size, benefits and socio-economic status. The study, therefore,

recommends that; Extension services towards fish farming activities should be improved through credits facilities that should be made available to fish farmers at flexible guidelines, promoting relevant policies towards enhancing the availability and affordability of conventional feeds, adoption of appropriate measures to ensure the safety of fishes by the fish farmers.

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