

Survey of fish farm facilities and operation in old Ifedapo, Oyo State, Nigeria

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Abstract

Fish farming in Nigeria is a growing agricultural venture operated by individuals, communities, institutions and cooperative societies using various facilities. This study examined the socio-economic characteristics of fish farmers, type of fish farming facilities operation and personnel involved in fish farming, problems faced by fish farmers in the study area were also highlighted. Sixty farmers were randomly selected from the list of registered farmers and structured questionnaires were used to obtain primary data from the respondents. Descriptive statistical analysis was used to analyze the data obtained from the respondents. Results of the study revealed that 67.0% of farmers were within 30 - 40 years, 45.0% of farmers have been in operation between 5 and 10 years and 35.0% of farmers operate on 2 hectares of land. Common purpose of fish farming in the area is for commercial purpose. 47.0% of farmers have secondary education, 78.0% of farmers practice monoculture, 88.0% culture catfish (*Clarias gariepinus*) and 80.0% manage the farms alone. Major problems faced by farmers in the study area include shortage of water supply, paucity of fund, filia cannibalism, and high cost of feed and poor marketing of the product. The study showed that fish farmers started their business on personal savings which has limited the production facilities, quantity of fish they produce and prevent them from expanding their business. Therefore, all stake holders should rise to the aid of rural farmers in order to boost fish production and to bridge the gap between demand and supply of fish. This will improve the protein intake of the populace.

Key word: Earthen pond, Catfish, monoculture, polyculture, concrete tank

Introduction

Fish farming is the cultivation of selected varieties of fishes in captivity. Fish farming is useful in providing fishes for human consumption as well as for restocking natural aquatic bodies for the purpose of commercial and game fishing (Godwin, 2005). Aquaculture in Nigeria is dominated by the production of catfish (often reared in high-density tank systems). Catfish are predominately sold fresh in the Southern Nigeria along with smoked fish in the markets. Smoked catfish are also preferred in northern parts of the country (Cocker,

2014). Fish culture has been successfully practiced in different structures ranging natural water body, earthen ponds, concrete tanks, plastic tanks etc. The selection of facilities depends on the available materials and the level of expertise of the farm manager (Akinwole et al., 2014). Fish is known as a very important component of human diet because of its high nutrition and significance in improving human health (Ladu, 2001). In Nigeria, fish contributes, on the average 20-25% per caput animal intake and could be as high as 80% in coastline and riverside communities. The average annual demand for

fish in Nigeria by 2006 was estimated to be 2.66 million metric tonnes (FDF, 2007).

Fish farming is a major business venture that has witnessed a rapid growth in Nigeria. A lot of interest has been generated and leading to the involvement of all levels of governments as well as private sectors which have virtually taken over the industry in the past two decades with massive investment (Ajani *et. al.*, 2011). Tilapia and *Clarias* species are the most widely cultured species in Nigeria due to their fast growth rate, omnivorous feeding habit, production in captivity, resistance to diseases and tolerance to wide range of environmental conditions (Fagbenro, 1987). A large percentage of people in Saki and its environs engage in farming, such as, crop farming, poultry farming and cattle rearing but literature did not reveal any existence of aquaculture activities in the area. The objectives of the study are to determine the socio-economic characteristics of farmers, the type of fish farming facilities, operation and personnel involved in fish farming operations and to highlight problems faced by fish farmers in the study area.

Materials and Methods

Study Area: The study areas were Saki-East, Saki-West and Atisbo local government of Oyo State. Saki – East has five major communities which are Ogbooro, Sepeteri, Ago-Amodu, Oje-Owode and Agbonle. Saki-West has about 250 communities some of which are Ajegunle, Challenge, Moboluwaji, Kinnikinni, Sango, IdiAraba etc. Atisbo is an acronym formed from Ago-are, Tede, Irawo, Sabe, Basi, Ofiki and Owo communities.

Data Collection: A list of registered fish farmers was collected from the three local governments' headquarters and association of fish farmers in Saki town being the umbrella body of fish farmers. Then a random selection of 20 farmers in Saki East, 30 farmers in Saki-West and 10 farmers in Atisbo was taken comprising a total of 60 farmers. Structured questionnaires were used to obtain primary data from the selected respondents. Data were obtained on socio-economic characteristics of farmers, type of facilities operation and personnel involved in fish farming and problems faced by fish farmers. Data obtained from the study were analysed using descriptive statistics analysis.

Results

Result of demography of fish farmers in old Ifedapo is presented in Table 1. The results of types of holding facilities used by farmers, fish species cultured, operation practiced by farmers, feeding and water quality management and personnel management and problems faced by fish farmers in the study area are presented in Tables 2, 3, 4, 5 and 6 respectively.

Table 1: Demography of fish farmers in Saki and its environs

Variables	N	%
Years of operation		
<5 Years	13	22
5-10 years	27	45
>10 years	20	33
Total	60	100
Size of farm		
2 hectares	21	35
4 hectares	20	33
6 hectares	08	13
8 hectares	05	09
10 hectares	06	10
Total	60	100
Age of fish farmers		
<30 years	12	20
30-40	40	67
>40	8	13
Total	60	100
Purpose of farming		
Commercial	50	83
Family consumption	10	17
Total	60	100
Education level		
No formal education	04	07
Primary	08	13
Secondary	28	47
Tertiary	20	33
Total	60	100
Culture system		
Mono culture	47	78
Poly culture	09	15
Both	04	07
Total	60	100
Source of Finance		
Bank loan	13	22
Personal saving	27	45
Cooperative	17	28
Others	03	05
Total	60	100
Marital status		
Single	06	10
Married	52	86.7
Separated	02	3.3
Total	60	100
Gender		
Male	54	90
Female	06	10
Total	60	100

Table 2: Types of holding facilities used in the study area

Variables	N	%
Types of holding facilities		
Concrete tank	18	30
Earthen Pond	29	48
Plastic Tank	06	10
Earthen Ponds and Concrete Tank	07	12
Total	60	100
Method of Pond Construction		
Mechanical	15	25
Manual	45	75
Total	60	100
Horticulture crop around the pond		
Yes	36	60
No	24	40
Total	60	100

Table 3: Types of Fish Species Cultured in the study area

Variables	N	%
Species culture		
Clarias spp.	53	88
Tilapia spp.	02	03
Both	05	09
Total	60	100
Factors that Determines choice of fish		
Fast growth	36	60
High market price	19	32
Acceptability	05	08
Total	60	100
Means of transporting fish seed		
Plastic Keg	53	88.3
Open Container	07	11.7
Total	60	100
Sources of Fish seed		
Wild	02	03
Purchase from farm	52	87
Self-breed	06	10
Total	60	100
Time of stocking		
Early in the morning	17	28
Afternoon	10	17
Evening	33	55
Total	60	100

Table 4: Operation Practices by respondents in the study area

	N	%
Application of fertilizer		
Broad cast	26	43
Heap in pond	08	13
Sprinkle	26	43
Total	60	100
Operational Practice		
Extensive	17	28
Semi Intensive	10	17
Intensive	33	55
Total	60	100
Type of fertilizer		
Manure	44	73
Inorganic	07	12
Combination	09	15
Total	60	100
Liming of Pond		
Yes	42	70
No	18	30
Total	60	100
Number of stocking per year		
Once	08	13
Twice	39	65
Three time	13	22
Total	60	100

Table 5: Feeding and water quality management in the study area

	N	%
Source of water		
Tap	02	03
Borehole	11	18
River	12	20
Stream	20	33
Well	15	25
Total	60	100
Aquatic Weed Control		
Manual Control	32	53
Chemical Control	06	10
Biology Control	22	37
Total	60	100
Types of Feed		
Local Feed	05	09
Imported Feed	46	76
Both	09	15
Total	60	100

Table 6: Personnel Management and problems facing fish farming in the study area

	N	%
Management of facilities		
Self	48	80
Pond Manager	10	16.7
Paid Consultant	02	3.3
Total	60	100
Major problem faced by Farmer		
Water supply	28	47
Capital	22	36
Cannibalism	04	07
Marketing	06	10
Total	60	100
Government Intervention		
Provision of Capital	20	33.3
High breeding Stock	25	41.7
Cheap Input	14	23.3
Private Investors Involvement	01	1.7
Total	60	100

Discussion

Demography of fish farmers in Saki and its environs:

Data on age shows that 20.0% of respondents were less than 30yrs old, 67.0% of the respondents were within 30-40 years while 30% were above 40 years. This implies that some of the farmers interviewed were still in active working age. This result is in line with the findings of Olaoye *et. al.*, (2014) who investigated perception of small scale fish farmers on agricultural extension services delivery toward aquaculture development in Oyo state and found out that majority of fish farmers fell within the age bracket 41-50years. Olowosegun *et. al.*, (2004) also considered this age bracket as economically active age. This shows that very few young and old people are involved in fish farming. 45.0% of fish farmers operating in the region have been in operation between 5 and 10years, while 22.0% of them have been in operation for less than 5years and 33.0% started operation more than 5years ago. This shows that fish farming in this region is not new; the venture has been in existent for over 10 years. Akinwole *et. al.*, (2014) reported that 50% of fish farmers have been in operation between 5 and 10 years in Ibarapa region of Oyo State. Data on size of farm revealed that 35.0% of farmers operate on 2 hectares of land, 33.0% operate on 4 hectares, 13.0% of farmers operate on 6 hectares of land, 9.0% of farmers operate on 8 hectares of land while 10.0% of respondent operate on 10 hectares of land in the region. This gave the farmers opportunity to increase the business in large scale units in the region. The common purpose of fish farming practice in the region is for commercial purposes. The frequency table shows that production of fresh fish in the region is widely accepted as a business to venture into. This table also shows that 45.0% of respondents in the region derived their finance from personal saving, 28.0% of respondent got their own through cooperative loans, 22.0% got theirs through bank loans while only 5.0% of them could get their own from friends and other sources. This

shows that finance is limiting factor in small scale farming. It is then necessary that farmers in the region be given financial support by government through the provision of loan facilities to farmers in order to improve aquaculture ventures.

Response on educational level shows that 47.0% have secondary school certificate, 33.0% have tertiary certificate, 13.0% have primary school certificate while 7.0% have no formal education in the region. Data on culture practice shows that 78.0% of farmers in the region practiced monoculture system, 15.0% of farmers practiced polyculture system while 7.0% of farmers practiced both monoculture and polyculture systems. Sex is very important in agriculture especially in the area of property rights and land acquisition. Majority (90.0%) of the fish farmers in the study area are males while 10.0% are female. This result corroborates the findings of Brummett *et. al.*, (2010) and Olaoye *et. al.*, (2014) that fisheries activities are mostly dominated by men. The table also shows that 86.7% of the respondents were married, 10.0% were single while 3.3% divorced. The result is in agreement with Oladoja *et.al.*, (2008) and Fakoya (2000) that marriage confers some level of responsibility and commitment on individuals who are married. This revealed that majority of the respondents were matured enough to engage in fish production in order to take good care of their families.

Holding Facilities used in the study area:

Table 2 shows that 48.0% of respondents used earthen pond, 30.0% of the respondents used concrete tanks and 10.0% of the respondents used plastic tank for fish culture while 12% of respondent used both earthen pond and concrete tank. Findings show that majority of fish farmers preferred earthen pond for fish culture due to the abundance of natural food for fish and limited natural food in concrete tank. This result agrees with the findings of Akinwole *et. al.*, 2014 that most farmers in Ibarapa region used earthen ponds because of ease of management and little water requirement. Methods of pond construction adopted by farmers include: manual

method (75.0%) because of its cost effectiveness between 25000-35000 and mechanical method (25.0%) because of high price range between 50,000 and above.

Types of fish species cultured in the study area:

Table 3 shows that catfish is first choice of species of culture (88.0%) in Saki and its environs due to its economic benefits, hardy nature and high ability to adapt to environmental condition of the region while 9.0% of respondents culture both catfish and tilapia species and 3.0% culture mainly tilapia species. Reasons given by farmers for choice of species are: fast growth (60.0%), high market price (32.0%) and acceptability of fish species (8.0%). Olaoye et. al., (2014), Akinwole et. al., (2014) also reported that *Clarias* species was the preferred fish species cultured by fish farmers in Oyo State due to their hardy characteristics and tolerance to wide range of water quality requirement. Majority of the respondents (88.0%) culture catfish as major fish species being cultured in the study area. 87.0% of farmers bought fish seed from other farms, 10.0% of farmers produced seed from their own farm (self-breed) while 3% of farmer that got their own from wild. 88.0% of farmers used plastic kegs to transport the fish seed, while 12.0% of the farmers used open container to transport the fish seed. Explanation on introduction of fish into the facility revealed that 55.0% of farmers introduced the fish into the facility in the evening, 28.0% of the farmers introduced fish into facility early in the morning while 17.0% introduced their fish into facility in the afternoon.

Fish farm operations practiced by respondents:

Table 4 shows information on operation practices of farmers in the study area. Information on type of fertilizer used by the farmer shows that 73.0% of the farmer used manure, 15.0% of farmer used combination while 12.0% used inorganic fertilizer to fertilize their facility. Also 43.0% broadcast their fertilizer, 43.0% sprinkle while 13.0% of the farmer heaped their fertilizer in ponds. 30.0% of the respondent do not lime their facilities. They used lime to eradicate predators and for adequate conditioning of soil and water. The table also shows 55.0% of respondents practiced intensive fish farming, 28.0% practiced extensive fish farming while 17% practiced semi-extensive. 65.0% of respondents stocked their pond twice in a year, 22.0% of respondents stocked trice in a year while 13.0% of respondents stocked once in a year.

Feeding and Water quality management by respondents:

Table 5 shows data on feeding and water quality management in the study area. Water quality includes all the physical, chemical and biological factors that influence beneficial use of water. Water quality of the culture systems affects the success or failure of fish farming operation (Omitoyin, 2007). Fish farmers need to measure the quality of the culture medium throughout the growing period so as to prevent problems associated with poor water quality. Major source of water used by

respondents in the region is Stream water (33.0%) which is commonly used for cultured fish, 20.0% use river water, and 25.0% use well water 18.0% use borehole water while 3.0% use municipal water. Method of aquatic weed control by farmers in the region reported by field survey is that 53.0% of farmers used manual method due to the fact that this method does not have any negative impact on fish production, 37.0% of farmers used Biological control while 10.0% of farmers used chemical to control aquatic weeds. Examples of chemical used are herbicide, paraforce and this is not advisable for farmers because it has direct effect on fish production, while Biological is done by introduction of grazing animals on aquatic weed. The common types of feed used by the respondents are mostly imported floating feed (75.0%), 9.0% used locally compounded feed while 15.0% of respondents used both local and imported feed. This is common because imported feeds help the farmers make physical observation on the wellbeing of fish.

Personnel management and problems faced by farmers:

Table 6 shows personnel management and problems faced by fish farmers in the study area 80.0% of farmers in the study area practices sole ownership and manage the farm by themselves, 16.7% employed farm manager while 3.3% employ the services of a consultant. Data on problems facing farmers revealed that water supply (47.0%) is the major problem facing them followed by lack of capital or fund (36.0%), marketing (10.0%), and cannibalism (7.0%). The constraint of water supply has a direct impact on fish production in the region, because if the region has good water, the fish production could be increased. 33.3% of the respondents want government to help them by providing capital, 41.7% want government to help them by providing high breeding stock while 23.3% of respondents want cheap input and 1.7% of respondent want private investors' involvement.

Conclusion

This study revealed that fish farming is a growing business in Saki and its environs in Oyo state, Nigeria. Major problems faced by fish farmers are lack of natural source of water and finance. For aquaculture business to be developed in this area, government should intervene by providing soft loans to farmers and provide natural source of water supply like dams in the area.

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