Assessment of Constraints and Prospects of Small-Scale Fish Farming in Jega LGA Area of Kebbi State, Nigeria

[1]Wade M. N., [1]Chitte I. U., [1]D. Y. Bawa and [2]Abdulrahman, A.
[1]Department of Forestry and Fisheries,
[2]Kebbi state University of Science and Technology, Aliero
[1]Department of Agricultural Technology,
[2]College of Agriculture and Technology, Bakura.
Corresponding author: Abdulrahman Aminu
aasarki@gmail.com

D.O.I: 10.56201/ijaes.v10.no3.2024.pg109.121

Abstract

The survey was conducted to assess the constraints and prospects of small scale fish farming in Jega Local Government Area of kebbi State. Out of the eleven districts in the local government, four were purposively selected based on major dominance of fish farming practice. simple random sampling was used in the distribution of forty-one questionnaires, viz: Magaji A (10), Magaji B (16), Firchin (7), and Kokani (8). Results (table 4.1) shows the distribution of small scale fish farmers across the districts based on their locations in the study area and indicated Magaji B with 39.0%, Magaji A with 24.4%, and then Kokani having 19.5%, while the least was Firchin with 17.0%. It may be assumed that people who are fishermen by tradition and close to a perennial river may find it easier to adopt fish farming. In this case magaji B district has a greater number of small scale fish farmers 39.02%. The problems faced by fish farmers include lack of visitation by fisheries agencies, high cost of feeds, low product prices, high cost of various input, lack of marketing facilities, occurrence of some fish disease and lack of capital or credit facilities. As a recommendation, the local authorities may consider providing loan facilities to fish farmers with low interest rate.

Keywords: *Fish farming, Respondents, Constraints, Fingerlings, Feed*

INTRODUCTION

Fish is a low-fat high quality protein source of food and also contain omega-3 fatty acids and vitamins such as vitamin D and B2. Fish is rich in calcium and phosphorus and a great source of minerals, such as iron, zinc, iodine, magnesium, and potassium (Masifundise | Jul 27,2016) . The major animal protein sources in Nigeria include cattle, goats, sheep, poultry and fish. Out of these sources fish and fish products provide more than 60% of the total protein intake in adults especially in the rural areas (Adekoya and Miller, 2004). Inoni(2007) cited that Nigerian fishing industry comprises of three major sub sectors namely the artisanal, industrial and aquaculture. The aquaculture sub sector contributes between 0.5% and 1% to Nigeria's domestic fish production. Fish culture is done in enclosures such as tanks as explained by Adewuyi et al. (2010); although fishing started over 40 years ago, aquaculture contribution to domestic fish production is minimal/ not significant. Regrettably, the supply has been on the decline (Ugumba and Chukwuji, 2010).

The industry now contributes only 2.0% of the Gross domestic product (GDP) and accounts for 0.2% of the total global fish production (Federal Department of Fisheries, 2006: Nigeria fish import and value 1993-2004). Nigeria is one of the largest importers of fish with a per capita consumption of 7.52kg and a total consumption of 1.2 million metric tons with imports making up about 2/3 of the total consumption global fishery production in 1990 (FAO report. FAO, Rome). The shortfall is said to be bridged by the importation of 680,000 metric tons annually consuming about N 50 billion in foreign exchange (Odukwe, 2007).This indicates the large deficit in fish supply in Nigeria Olopade and Olaokun (2005). Equally estimated was the possible creation of 30000 jobs and generation of revenue of US$160 million per annum by the aquaculture industry (Ugumba and Chukwuji, 2010). These prompted the Federal Government of Nigeria to package the Presidential Initiative on fisheries and aquaculture development in 2003 to provide financial and technical assistance to government programmes and projects encouraging fish production. Despites these efforts by the Government, fish production remained low in the country .Ugumba and Chukwuji (2010) reported that awareness on the potential of aquaculture to contribute to domestic fish production has continued to increase in the country. This stems from the need to meet the much needed fish for domestic production and export. Therefore, the importance of the fishing industry to the sustainability of animal protein supply in the country cannot be over-emphasized. The development of the fish industry will increase local production of fish and save much of the foreign exchange being used for fish importation. Specifically, it has a special role of ensuring food security, alleviating poverty and provision of animal protein. The practice of rearing, raising, producing or growing fish in a water managed system (pond) is called fish farming or aquaculture. The world's fastest growing food production sub-sector, increasing at a yearly rate of about 8.9% since 1970 is fish farming (World Fish Center, 2009). Fish is a vital source of income for many developing countries in which Nigeria is one (Williams et al., 2010). Apart from animal source of protein other usefulness of fish includes employment generation, poverty reduction and saving foreign exchange by stimulating local production at various rural areas (Yunusa and Maidala, 2008). The cheapest source of animal protein in Nigeria consumed is fish according to federal department of fisheries (FDF, 2009). Alexander (2000), reported that "fish is a high quality protein rich in micronutrients that are not present in staple foods". Fish is superior to other sources of animal protein as it contains most of the essential amino acid particularly leucine, lysine, tryptophan and methionine, hence fish protein is regarded as first class protein (Ekelemu et al., 2000). Fish farming is a profitable enterprise and it is rapidly expanding and it will continue to be viable if its management and planning are well implemented (Runfu et al., 2009). Small scale aquaculture represents the backbone of many rural communities in many countries and it forms the basis that provides livelihoods of many people living in the areas.

Fish production or aquaculture is generally constrained by lack of production knowledge and skills, suboptimal stocking and/or overstocking, shortage of fingerlings, type of fish species supply while, limited conducive market access, constitutes majority and envisaged problems.

There is an open limitation of knowledge in fisheries science in general and aquaculture in particular in the whole of Africa, particularly Nigeria. This necessitates primary research on areas like the knowledge of indigenous fish species and their culture potentials regarding the culture species and conducive culture locations. This would go a long way in boosting the immature aquaculture industry in a country with vast water resources, huge aquaculture land and immense

human population. With lots of aquaculture entrepreneurial potentials in areas of fish production, fish seeds production, fish feed production, fish processing and marketing, apparent research in these apertures becomes essential to uncover the areas of varied investments by both the nationals and the international communities. The floodplains of Jega river in Jega local Government which are presently used for rice production are prone to fish production but consists only of limited farms. Findings into the limitation on fish farming prompted this research.

The main aim of this study is to assess the constraints and prospects of small scale fish farming in Jega Local Government Area of kebbi State.

The Specific Objectives are:

-to describe the socio economic status of the respondents.

-to determine the types of culture systems practiced in the area.

-to examine the quality of fish seeds used by the farmers.

-to assess the challenges faced by fish farmers in the area.

The scope of this study only covers fish farmers in Jega Local Government Area of Kebbi State.

MATERIALS AND METHOD

Study area

Jega has a latitude of 12^0 $13^{'}$ 19.88'' N and longitude: 4^0 22' 46.67" E Jega is a local government area in kebbi state with headquaters in jega. The districts that make up jega LGA include, Magaji (A), Magaji (B), Kokani, Kimba, Akalawa, Maza goma, Gindi, Dumbegu, Sarkin fada, Firchin and Basaura. Jega is among the 21 local government area of kebbi state having the estimated population of 193,352 (2006 census) inhabitants with the area mostly populated by people from hausa and Fulani ethnic divisions. The hausa language is commonly spoken in the area while islam is the most practiced religion in the area. Jega LGA occupies a total area of 891 km^2 and witnesses two major seasons in a year, which are dry and the rainy seasons. The LGA has an average humidity level of 29 percent with the average wind speed in the area put at 11 km/h.

Sampling procedure.

Jega Local Government Area has eleven (11) districts out of the eleven districts listed, four has being purposively selected based on major dominance of fish farming practice. From the four (4) selected districts, simple random sampling was used to distribute questionnaires to each of the four (4) districts based on the number of the respondents available such as, Magaji A (10), Magaji B (16), Firchin (7), and Kokani (8) making a total sample size of forty one (41) respondents.

Data collection.

Forty one (41) well-structured questionnaires were used for administration; data were collected based on demographic characteristics of the respondents, management practices and challenges to enable assessment of the constraints and prospects of fish farming and benefits derived from fish in the study area.

Analytical technique

The analytical tool used for data analysis included descriptive statistics such as frequency tables and percentages by means of the statistical package for social science (SPSS) version 23 to achieve the objectives.

RESULTS

The result in table 1 shows the distribution of small scale fish farmers across the districts based on their locations in the study area and indicated Magaji B (39.0%) with highest concentration while the least was Firchin with 17.0%.

TABLE 1: Distribution of small scale fish farmers according to localities

Localities	Frequency	Percentage
Dis. 1 (Magaji A)	10	24.39%
Dis. 2 (Magji B)	16	39.02%
Dis. 3 (Firchin)	7	17.07%
Dis. 4 (Kokani)	8	19.51%
Total	**41**	**100**

Results in table 2 shows that all 100.0% of the respondents are males. The marital status indicated that most (56.1%) of the respondents are married, 41.5% are single, while the least percentage (2.4%) of the respondents emerged under widows. Most of the respondents (41.5%) are at age range of 31-40 and some 39.0% are at the age range of 21-30, the age above 40 covered 17%, while the least 2.4% of the respondents are at the age range of 10-20. Majority of the respondents (41.%) obtained educational level of OND/NCE those with B.sc/ M.sc covered 34.1%, and secondary leavers have 22.0 %, while those with no formal education at all had the least percentage (2.4%). Main occupation of respondents indicated that, business men have 36.6 %, coverage, followed by fish farmers having 29.3%, and civil servants have 29.3%, while others have 4.9%. The same table have shown that most of the respondents are not involved in any association (85.4%), while the least 14.6%, of the respondents belongs to some associations.

TABLE 3: Distribution of respondents according to socio-economic status.

Variable	Specification	Frequency	Percent
Sex	Male	41	100.0
Marital status			
	Married	23	56.1
	Single	17	41.5
	Widow	1	2.4
Total		**41**	**100.0**
Age			

	10-20	1	2.4
	21-30	16	39.0
	31-40	17	41.5
	Above	7	17.1
Total		**41**	**100.0**
Education level			
	Secondary	9	22.0
	OND/NCE	17	41.5
	B.Sc./M.Sc.	14	34.1
	No formal education	1	2.4
Total	**Total**	**41**	**100.0**
Occupation			
	Civil servant	12	29.3
	Fish farmer	12	29.3
	Business men	15	36.6
	Others	2	4.9
Total		**41**	**100.0**
Do you belong to any association			
	Yes	6	14.6
	No	35	85.41
Total		**41**	**100.0**
If yes state the name of the association			
	Fisheries society of Nigeria	1	2.4
	MSSN	15	36.6
	Almeria charity	1	4.9
	First aid	15	36.6
	Teaching	9	22.0
Total		**41**	**100.0**

Results in table 3 have shown the duration in fish farming practice, majority of the respondents in fish farming practice in the area covers 43.9% with period range of 2-5 years, those who started longer (31.7%) with years range of 6-10 years, while the least percentage (2.4%) are those with longest practice period (11-20 years). The table indicated the land ownership, where majority of those who purchase land covered 43.9%, those who rent their land portion (34.1%), and those who inherited their lands (1.5%). The table have also shown the types of facilities used, where almost all respondents are using concrete ponds in the study area (100.0%). The table indicated the culture species in the area where Clarians / Heterobrancus dominated (92.7%) ,and others which mainly consist of tilapia have 7.3%. The result indicated the major source of fish seeds, to be the National Institute for Fresh water Fisheries Research (NIFFR) New Bussa Niger State having 80.5%. Another source shown are private fish farms having 17.1%. The last source of fish seeds as

indicated is Kebbi State Ministry of Agriculture/State ADP having 2.4%. The table indicated culture water source, mainly as borehole water with 78.0%, while the least is deep well water having 22.0%. On the choice of fish production type by the respondents, majority of them (78.0%) culture table size fish. Some 7.3% produce fish fingerlings while 9.8% culture both. The table also have indicated the frequency of visit by fisheries agents in the study area, others who are not visited by any agents occupy 68.3%, those visited once a year have 26.8%, while the least are those visited once per month covering 4.9%. The table also indicated normal harvest span by respondents, those that harvest within 6-7 months period dominates with 80.5%, followed by those that harvest within the period 11-12 months span having 14.6%, and then the least are those that harvest within the range of 3-4 months having 4.9%. Table 3 finally indicated the marketing of fish where the respondents that sells fish in their farms dominate the percentage (80.5%), those who process the fish and sell in the market having 17.1%, and the least are those who supply harvests to the restaurants having 2.4%. Result have shown that most of fish farmers started their business with personal savings capital (65.9%), those that obtained loans covered 22.0%, and few of them (12.2%) started through cooperatives union source of capital.

TABLE 4: Distribution of respondents according to management practices of fish farming.

Variable	Specification	Frequency	Percent
How long have you been in fish farming	Just started	13	31.7
	2-5years	18	43.9
	6-10years	9	22.0
	11-20years	1	2.4
Total		**41**	**100.0**
Source of land ownership			
	Heritage	8	19.5
	Rent age	14	34.1
	Purchase	18	43.9
	Others	1	2.4
Total		**41**	**100.0**
Indicate type of facilities used			
	Concrete pond	**41**	**100.0**
Tick fish species cultured			
	Tilapia	3	7.3
	Clarias/Hterobracus	38	92.7
Total		**41**	**100.0**
Indicate the source of fish seeds			

	Kebbi State Ministry of Agriculture/State ADP	1	2.4
	National Institute of Fresh water Fisheries Research (NIFFR), New Bussa, Niger State	33	80.5
	Private Fish Farm	7	17.1
Total		**41**	**100.0**
If private farm, state name of the farm			
	Labana Farms Aleiro	4	9.8
	Ummi Hadiza Farm	2	4.9
	Ni'ima Farms	35	85.4
Total		**41**	**100.0**
Indicate culture water source			
	Deep well water	9	22.0
	Borehole water	32	78.0
Total		**41**	**100.0**
Which of the following do you engage in culture			
	fish fingerling productic	3	7.3
	Table size fish production	34	82.9
	Both	4	9.8
Total		**41**	**100.0**
How often does fisheries agents visit your farm			
	Once/month	2	4.9

	Once/year	11	26.8
	Others	28	68.3
Total		**41**	**100.0**
Indicate your normal harvest span			
	3-4 months	2	4.9
	6-7 months	33	80.5
	11-12 months	6	14.6
Total		**41**	**100.0**
Fish marketing			
	On farm sales	33	80.5
	Supply harvest to the restaurants	1	2.4
	Process fish and sale in the main market	7	17.1
Total		**41**	**100.0**
Source of capital			
	Cooperative	5	12.2
	Personal saving	27	65.9
	Loan	9	22.0
Total		41	100.0

Results in table 4.4 indicate how challenges and constraints affect the level of fish production in the study area. Low prices for instance appeared least serious (29.3%). Problem of floods as well appeared not a serious issue (90.2%). Poaching also understood summarily as not serious (78.0%). Lack of quality fingerlings appeared not serious (36.6%). However, higher cost of feeds appeared very serious with 53.7% confirmation. Lack of capital had a serious rating of 43.9%. Disease as problem appeared least serious (41.5%). On contaminated water, results showed not serious with a rating of 85.4%.

TABLE 5: Indicates challenges faced by fish farmers in every day culture

Variable	Specification	Frequency	Percent
Low prices	Very serious	4	9.8
	Serious	5	12.2
	Moderate serious	10	24.4
	Least serious	12	29.3
	Not serious	10	24.4
Total		**41**	**100.0**
Floods			
	Moderate serious	1	2.4
	Least serious	3	7.3
	Not serious	37	90.2
Total		**41**	**100.0**
Poaching			
	Serious	6	14.6
	Moderate serious	2	4.9
	Least serious	1	2.4
	Not serious	32	78.0
Total		**41**	**100.0**
Lack of quality fingerlings			
	Very serious	2	4.9
	Moderate serious	12	29.3
	Least serious	12	29.3
	Not serious	15	36.6
Total		**41**	**100.0**
High cost of feed			
	Very serious	22	53.7
	Serious	10	24.4
	Moderate serious	6	14.6
	Least serious	1	2.4
	Not serious	2	4.9
Total		**41**	**100.0**
Lack of capital			
	Very serious	2	4.9
	Serious	18	43.9
	Moderate serious	8	19.5
	Least serious	7	17.1
	Not serious	6	14.6
Total		**41**	**100.0**
Disease			
	Very serious	1	2.4
	Serious	1	2.4
	Moderate serious	9	22.0
	Least serious	17	41.5

	Not serious	13	31.7
Total		**41**	**100.0**
Contaminated water source			
	Serious	1	2.4
	Moderate serious	1	2.4
	Least serious	4	9.8
	Not serious	35	85.4
Total		**41**	**100.0**
What number do you stock last harvest.			

Discussion and Conclusion.

From the survey it was found that only males were engaged in fish farming in the study area. Majority are married as the major age range was 31-40 years. Although the study was on small scale fish farming, the level of education of participants is dominated by OND/NCE and B.sc/M.sc degree holders. It was as well found that most respondents are from other business groups than aquaculture. Sharif et al., (2005) found similar result with the present study when he reported his work on income source of farm owners. Apart from Agriculture and aquaculture, farmers were found to engage in other income generating activities including their own business, services and other activities.

The survey also found a decreasing trend in enrolment into fish farming probably due to prevailing challenges. It was also observed that over three quarters of fish farmers started their farming business with personal savings. This assertion is in agreement with kudiet et al., (2008) who discovered that most fish farmers in Nigeria depends on their personal savings to finance their production activities. Land ownership was found to be through purchase. Types of facilities are dominated by concrete tanks for aquaculture while the choice of culture species were found to be Clarias/Heterobracus in the majority. Fisheries extension agents were found not to have established their visits to the study area for guiding fish farmers. The source of fish seeds for the farmers is mainly NIFFR, New bussa. However, most of the farmers in the study area embark on table-size fish production and majority culture their fish for six months. On fish sales, majority prefer on-farm fish sales due to poor market-chain set-up. Sharif et al., (2005) on similar studies found comparatively close results to the present findings where he reported that farmers had to collect fish fry from different hatcheries from bagra and Mymensingh due to high prices of fry and fingerlings in sadar upazila.

One important factor that was of serious complain by the respondents was the cost of fish feed and lack of capital. Another complain that may attract concern was of disease such as fin rot, tail rot and Hemorrhagic lesions over body surface (personal experience). Similar findings are also reported by Faruk et al.,(2008) who mentioned that the common disease of freshwater fishes of Bangladesh were tail and fin rot, Bacterial gill rot, dropsy, and various types of fungal disease etc.

Conclusion

The problems faced by fish farmers include lack of visitation by fisheries agencies, high cost of feeds, low products prices, high cost of various input, lack of marketing facilities, and some fish disease as well as lack of credit facilities.

Recommendation

- Government should try to provide loan facilities to fish farmers with low interest rate.
- With great potentials in fish production in the study area training programs on fish farming entrepreneurship should be organized in these communities.
- Government should try to provide fish feed formulating facilities and proper training on fish feed formulation in the study area to ensure availability of fish feed supply which may decrease cost of feed.
- Government should also employ fisheries agencies that will assist and encourage fish farmers in solving common problems and challenges.
- Government should also fix a standard fish market with facilities for preservation.

References

ADB, (2005). An evaluation of small-scale fresh water rural aquaculture development for poverty reduction. Operation Evaluation Department, Asian Development Bank, Asian Development Bank publications, ISBN 071-560-3, Manila, 164.

Adewuyi SA, (2010). Analysis of profitability of fish farming in ogun state, Nigeria. J. Human Ecol..31(3):179-184. Agric. 3(2); 86-911: 47-5 (52004).43b. African Journal of Livestock. Agricultural Economics and Rural Development 2 (1): 2009 Pp 0 14

Ahmed, M., Rab, M.A., and bimbao, M.P (1994). Sustainable aquaculture in small water bodies: Experiences from Bangladesh. Integrated fish farming, CRC.

Akintunde , N.A (2009) : Freshwater fish seed resources in Nigeria . Fishnetwork , Vol.5 (4) Pp . 26-3 7.2009 Alimosh Local Government Area of Lagos State.

Ayinla , O.A .(1988) : Nutrition and reproductive performance of the African catfish (Burchell (1822) . Ph.D Thesis , University of Ibadan , Nigeria Beverage R. O. and Phillips N. (1990) : The fishing industry in Nigeria . Status and potential for self-sufficiency in fish production . NIOMR Tech . Paper

Beverage R.O and Phillips N. (1990): The fishing industry in Nigeria. Status and potential for self-sufficiency in fish production.NIOMR Tech. Paper No.

Conquer , J. and Holub , B.J. (2002) : Human Health Effects of Decosahexanaenoic acid , Pp.311-329 .Determinants of yield performance in small scale fish farming.

Falaye , A. E. (1988) : Utilization of Cocoa husk in the nutrition of Tilapia (*O. niloticus*) (Trewavas) . Ph.D Thesis , University of Ibadan , Nigeria . Cassava peel. Nigerian Journal of Applied Fisheries and Hydrobiology.

FAO (1995b). Review of the State of World Fisheries Resources: Aquaculture; Fisheries Circular No. 886.

Faturoti, E. 0. (1999): Fisheries potentials and investment opportunities.

Federal Department of Fisheries (2005): Fisheries statistics of Nigeria.

Federal Department of Fisheries (2006): Nigeria fish import and value (1992)in the diets of African catfish (*Clarias gariepinus* (Burchell. 1822) PhD.

International finance cooperation IFC (2004): Use of the fish comities to assess environment impacts in South Carolina coastal plain streams. T. Am. Fish. Soc. 125, 633- 644.Investors workshop held at NIOMR. Lagos. April 22nd1999 Kaduna State. Nigeria. ARPN Journal of Agriculture and Biology (Science. Vol. 3. No. 5 and 6, Pp. 17-21).

Inoni O. E (2007). Allocatine Efficiency in pond Fish Production in Delta State, Nigeria: A Production Function Approach. Journal of Agriculture Tropica Et Subtropica. 40(2): 127-134.

Kudiet I.R. Bako, F. P. and Atala T. K, (2008) Economics of fish production in Nigeria. Paper presented at the Fisheries Society of Nigeria (FISON).

Masifundise (Jul 27,2016) Discussion papers, latest News, policy process, Small scale fishing| 12 comments.

Noman, M.R.F. (2012). Constraints and Scope for Practicing Sandbar

Norman D. W. (1972.): An economic study of three villages

Olukunle, A. O and Falaye, A. E. (1998): Use of Sesame seed cake as province,Samani miscellaneous paper 38,institute ibr. Agriculture.

Odukwe A(2007). Fish Farming in the Tropics: A Functional Approach. Maxiprints, Awka, Nigeria.Book Reviw.

Olapade A. O, (2005). Fisheries Extension services in Ogun State. Afri.J. Livestock Extens., 3: 78-81.

Omitoyin, B.O. (2007): Introduction of Fish Farming in Nigeria. Ibadan University press.pp.1-9

Omitoyin. B.O.(1995): Utilization of poultry by-products (Feather and oflalin the diets African catfish(*Clarias gariepinus*)(Burchell.1822).PhD Thesis,University of Ibadan,Nigeria.

Raufu, M. O..Adepoju, A. A., Salau, A. S. and Adebivi O. A..(2009) replacement for fish meal in diets of catfish (*Clarias gariepinus*) Thesis, University of Ibadan, Nigeria.University Press. Pp. 1-9.

Raufu,M. O..Adepoju,A.A,salau,A.S. and AdebiviO.A.(2009)determination of yield performance in small scale fish farming in Alimoshe Local Government Area of lagos State. Journal Agricultural Economics and Rural Development 2-1: 2009 Pp 0-14..