

Problems and prospects of small-scale fish farming in Jos South Local Government Area of Plateau State, Nigeria

Doyi, Daniel Suleiman¹, Dung, Gyang Musa¹, Mashingil, Ucham Danladi¹, Yisa, Kolo Moses¹, Kumdet, Asabar¹, Umaru, Nendir John Haruna² and Barde, Israel Joshua^{2*}

¹Federal Collage of Land Resources Technology, Kuru, Plateau State, Nigeria.

²Diagnostic Services Department, National Veterinary Research Institute, Vom, Plateau State, Nigeria.

*Corresponding author. Email: israelbarde@yahoo.com; Tel: +2348066655055.

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ABSTRACT: This study was carried out to analyse the problems and prospects of small-scale fish farming in Jos-South Local Government Area of Plateau State, Nigeria. The purposive sampling technique was used through a questionnaire and interview scheduled with the assistance of extension agents to collect data from respondents; 30 respondents were selected from each of the 4 districts in the study areas, making the total of 120 respondents. Data was analysed using frequency, percentage, mean, and standard deviation. The result revealed 34.2% were between 41-50 years, 62.5% were married, 63.3% had tertiary education, 62.5% had 6-10 years of farming experience, 70.8% had income between ₦50,000 and ₦100,000, 62.5% source information from friends and 54.2% source fingerling from friends. The study further revealed that the major issues faced by the farmers include lack of capital, poor storage technology, high cost of feed, lack of contact with extension agents, poor marketing and bad weather, while the prospects of farmers include: utilization of dam for aquaculture, potentially of integrated aquaculture and enough human resources. In conclusion, it was recommended that farmers should form comparative societies to give out loans at little or no interest rate, extension service delivery should be strengthened for effective and efficient teaching information delivery by the government and NGO, farmers should identify channels of marketing and fisheries expert should help the local farmers to succeed.

Keywords: Fish farming, Nigeria, Plateau State, problems, prospects.

INTRODUCTION

Fish farming (culture) is the act of rearing selected species of fish under scientifically controlled conditions in enclosed bodies of water such as ponds, streams, rivers, etc., where they feed, grow, and are harvested for consumption or sale (Iwena, 2012). Of the major protein sources, fish products provide more than 60% of the total protein intake in adults, especially in rural areas (Adekoya and Miller, 2004; Barde *et al.*, 2022). Also, Inoni (2007) cited that the Nigerian fishing industry comprises 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. Although fishing started over years ago, aquaculture's contribution to domestic fish production is minimal/not significant (Barde *et al.*, 2022).

Undoubtedly fish farming provides important services such as supporting the nutritional well-being of the population, providing feed-stuff for the industrial sector, making contributions to rural development, increasing export opportunities, enhancing the administration of natural resources and conservation of biological diversity (FAO, 2016; Rana *et al.*, 2024). In Nigeria, the demand for fish is on the increase owing to the growing population and

the changing feeding habits among the citizens as they move towards healthy living. With its cholesterol-free white meat, fish offers the best nutrition profile for humans. Aquaculture is the only sustainable source of fish and has great potential for growth in Nigeria due mainly to the presence of a wide variety of water resources such as rivers, springs, dams, lakes and oceans. Nigeria has a land area of 923,768 km² with a length of coastline of 853 km. It also has a vast network of inland water like rivers, floodplains, natural and made lakes and reservoirs (Adewuyi et al., 2010).

However, the country spends about N125.38 billion every year on the importation of 1.9 million metric tonnes of fish in order to meet the demand for the commodity (Federal Ministry of Agriculture and Rural Development, FMARD, 2016). This amounted to \$700 million every year in terms of foreign exchange spending on fish only. The demand and supply gap in food has been persistently negative since 1991 such that a gap of about 2 million metric tonnes of fish was recorded in 2016 (FMARD, 2016) indicating about a 30% self-sufficiency ratio in the fishery subsector. Despite the high growth potential of the fishery subsector, it has not been able to meet the demand for fish and fishery products in Nigeria. Also, its contribution to Gross Domestic Product (GDP) remained low at 4%. The key factors that hinder the success of activities to ensure product sustainability may lie in the challenges encountered by small-scale fish farmers and their influences to ensure effective fish farming (Nkamigbo *et al.*, 2014; Akinsorotan *et al.*, 2019). Thus, this study seeks answers to the following questions.

1. What are the socio-economic characteristics of the fish farmers?
2. What are the sources of fingerlings of the farmers?
3. What are the sources of information to the farmers?
4. What are the problems faced by the farmers?
5. What are the prospects of the farmers?

Objective

The study aims to analyse the problems and prospects of small-scale fish farming, while the specific objectives include the following.

1. To describe the socio-economic characteristics of fish farmers.
2. To identify the sources of fingerlings of the farmers.
3. To identify the sources of information for the farmers.
4. To identify the problems faced by the farmers
5. To identify the prospects of the farmers.

This will bring to light the socio-economic characteristics of fish farmers, sources of fingerlings, sources of information to farmers, and solve the problem and prospects of small-

scale fish farming. Additionally, this study will be of great value to the Government especially the Ministry of Agriculture and the Agricultural Development Programme (ADP). It will provide empirical evidence on the problems and prospects of farmers and fish farming. Finally, the study will greatly benefit Academia since it will serve to advance the literature on farmers participating in fish farming.

METHODOLOGY

The study area

Jos is located in Nigeria's middle belt with an area of 26,899 square kilometres. The state has an estimated population of about three million people (NPC, 2006). Jos lies within the Guinea Savanna agroecological zone of Nigeria. Jos South Local Government Area is located between latitude 9°30 North and longitude 8°30 East. It is situated in the North Western part of the state with its headquarters at Bukuru, which is about 15 km from the state capital Jos. The local government area has four districts; Du, Gyel, Kuru and Vwang districts. The local government area has a total land area of about 1,037 kilometre square. Jos South Local Government Area is characterised by a cold climate, the wet season (April to October) and the dry season (November to March). The dry season is characterized by the cool dry, dusty harmattan blows across the Sahara. Relative humidity is low and temperatures may drop below 15°C in August. According to the 2006 census, the population of Plateau State is 3,178,712 of which Jos South Local Government Area has a population of 306,716 and are mostly peasant farmers (NPC, 2006). Jos South Local Government Area is dominated by the Berom, mixed with other tribes. Aquatic animals are reared of which fish is not exceptional. Ruminants and non-ruminants are reared in the study area as well.

Sample procedure and sampling size

The study area comprises four main districts Namely; Du, Gyel, Kuru, and Vwang. Thirty respondents were purposively selected in each district with the assistance of an extension agent making a total of 120 respondents which constitute the sample size for data collection.

Method of data collection

The primary data were sourced through the use of a structured questionnaire and interview schedule in the four districts of Jos South Local Government Area with the assistance of extension agents who help in establishing contact with fish farmers.

Data analyses

Descriptive statistics such as frequency, mean and percentage were used to analyse objectives 1, 2, and 3, while objectives 4 and 5 were analysed with mean and standard deviation.

RESULT AND DISCUSSION

The age of respondents according to the field survey, indicate that 16.7% of the respondents were less than 30 years, 25.0% were 31 - 40 years, 34.2% were 41 - 50 years, 16.7% were 51 - 60 years and 7.5% were over 61 years. This is an indication that the majority of the farmers were between 41-50 years old (Table 1), which also implies that the majority of the farmers were in their active ages characterised by vigour to content with the drudgery in fish farming. This disagrees with Ajayi and Egwere (2021) who stated that the majority of the fish farmers are fairly old.

The sex distribution of the respondents according to the field survey indicates that 62.5% were male while 37.5% were female (Table 1). This indicates that the majority of the farmers are male. This result agrees with the findings of Sadiq and Kolo, (2015) who revealed that the majority of the farmers were male. This implies that the males see fish farming as a source of livelihood.

The results indicate that 12.5% of the farmers are single, 62.5% are married, 16.7% are widows and 8.3% are widowers (Table 1). This indicates that the majority of the farmers were married. This may be responsible for additional labour supply to complement farmer efforts, as similarly reported by Sadiq and Kolo (2015).

The results also show that 42.2% acquired adult education, 7.5% primary, 25.05 secondary and 63.3% tertiary (Table 1). This indicates that the majority of the farmers attained tertiary educational training. This implies that the use of technological information that will enhance productivity may be embraced reality.

The results obtained also indicate that 8.3% have a farming experience of less than a year, 12.5% 1-5 years, 62.5% 6-10 years, 9.2% 11-15 years and 7.5% more than 16 years (Table 1). This agrees with Ajayi and Egwere (2021) who stated that the majority of farmers have 7 years of farming experience. This implies that from the experience of farmers, most of them know how to overcome challenges in fish farming.

On the farmer's levels of income, the result indicates that 9.2% get an income of less than ₦50,000, 70.8% get between ₦50,000 - ₦100,000, 8.3% ₦101,000 - ₦200,000, 7.5% ₦201,000 - ₦400,000 and 4.2% get more than ₦401,000 (Table 1). This indicates that the majority of the farmers get between ₦50,000 and ₦100,000. This disagrees with Sadiq and Kolo (2015) who stated that the majority of the farmers get more than ₦400,000 in income. This implies that farmers have

Table 1. Characteristics of the respondents.

Parameters	Frequency	Percentage
Age		
1-30	20	16.7
31-40	30	25.0
41-50	41	34.2
51-60	20	16.7
>61	9	7.5
Total	120	100.0
Sex		
Male	75	62.5
Female	45	37.5
Total	120	100.0
Marital status		
Single	15	12.5
Married	75	62.5
Windows	20	16.7
Widowers	10	8.3
Total	100	100.0
Education		
Adult Edu.	5	42.2
Primary	9	7.5
Secondary	30	25.0
Tertiary	76	63.3
Total	120	100.0
farming experience		
< 1 year	10	8.3
1-5 years	15	12.5
6-10 years	75	16.5
11-15 years	11	9.20
>16 years	9	7.5
Total	120	100.0
Level of income		
<₦50,000	11	9.2
₦50,000-₦100,000	85	70.8
₦101,000-200,000	10	8.3
₦201,000-₦110,000	9	7.5
₦401,000	5	4.2
Total	120	100.0
Source of information		
Friends	75	62.5
Mass media	25	20.8
Extension agents	15	12.5
Others	5	4.2
Total	120	100.0
Source of fingering		
Friends	65	54.2
Local farmers	30	25.0
Research institutes	10	8.3
Company	15	12.5
Total	120	100.0

Table 2. Problems faced by farmers in fish farming result of fieldwork topic.

Problem	Mean	Standard deviation	Ranking
Luck of capital	(4)57%	0.5115	1 st
Poor storage technology	(3)54.2%	0.75392	4 th
High cost of feed	(4)50%	0.80679	1 st
High cost of labour	(2)50%	0.852209	7 th
Contact with EA	(3)50.0%	0.87945	4 th
Poor marketing	(4)45.8%	1.00203	1 st
Pest and diseases	(1)37.5%	0.99604	14 th
Weather	(3)33.3%	0.76131	4 th
High mortality	(2)29.3%	0.63540	7 th
Scarcity of brooding stock	(2)57.5%	0.53672	7 th
Inadequate water supply	(2)(45.8%)	0.453672	7 th
Total		30	4.500882

Table 3. Prospects of small-scale fish farming.

Prospects	Mean	Standard deviation	Rank
Utility of dam for aquaculture	4(33.3%)	0.65570	1 st
Engagement of woman and youth in aquaculture	2(33.3%)	0.91749	1 st
Potentiality of integrated aquaculture	4 (41.7%)	0.931110	1 st
People's desire to involve in aquaculture	4 (37.5%)	0.94628	1 st
Enough human resources	4(33.3%)	0.85561	4 th
Total	17	4.306131	

challenges with the marketing of the fish.

On the source of farmer information, 62.5% of fish farmers get information from friends, 20.8% from mass media, 12.65% from extension agents, and 4.2% from others (Table 1). This indicates that the majority of the farmers get information from friends. This implies that farmers could be misinformed on valid technical information on fish farming.

Table 1 also indicates that 54.2% of farmers obtained their fingerling from friends, 25% from local farmers, 8.3% from research institutes and 12.5% from companies. This indicates that the majority of the farmers get their fingerlings from friends. This agrees with Ajayi and Egwere (2021) who stated that the farmer's source of fingerling is from friends. This could be the local breeds of the fish which take longer time to grow and a lot of cost is incurred in feeding and other inputs.

From Table 2, lack of capital, high cost of feeds and poor marketing ranked highest as their major constraints. This was followed by the high cost of feed in fish farming, poor storage technology farming, lack of contact with extension agents and the weather as their next challenges. Some farmers disagree that high labour costs, higher mortality rates, scarcity of brooding stocks and inadequate supply are not challenges in fish farming and some farmers strongly disagree that pest and diseases is not a

challenge. This agrees with Sadiq and Kolo (2015), Ajayi and Egwere (2021) and Kudi *et al.* (2008) who reported similar findings.

On the prospects of fish farmers, as shown in Table 3, the farmers strongly agreed that the utilization of dams for aquaculture, the potentiality of integrated aquaculture and people's desire to be involved in aquaculture are the prospects. They also agreed that enough human resources is a prospect while they disagreed with the involvement of humans and youths in aquaculture. This agreed with the findings of Sifuddin *et al.* (2022) who stated that the above are prospects of farmers. This implies that the prospect of farmers in fish farming may differs from each farmer but the ultimate prospect is to have good economic value from the fish farming.

Conclusion

From the findings, the major challenges faced by the farmers include lack of capital, poor storage technology, high cost of feed, lack of contact with extension agents, poor marketing and weather while the prospect of farmers is the utilization of dam for aquaculture, potentially of integrated aquaculture and enough human resource. Therefore, farmers should form comparative societies to

give out loans at little or no interest rate. Extension service delivery should be strengthened for effective and efficient teaching information delivery by the government and NGOs. Farmers should identify channels of marketing and fisheries experts should help the local farmers.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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