ISSN: 3029-0724

Research Article

Journal of Environmental Science and Agricultural Research

Biotechnical Factors of Homestead Fish Farming in Ado Local Government Area, Ekiti State, Nigeria

Fapohunda* **and Akinbamido**

Department of Fisheries and Aquaculture Management, Faculty of Agricultural Sciences, Ekiti State University, Ado-Ekiti, Nigeria

***Corresponding author**
Fapohunda, Department of Fisheries and Aquaculture Management, Faculty of Agricultural Sciences, Ekiti State University, Ado-Ekiti, Nigeria.

Received: Apil 26, 2026; **Accepted:** May 11, 2026; **Published:** May 18, 2026

ABSTRACT

This research determined the biotechnical factors of homestead fish farming in Ado-Ekiti, Nigeria. Primary data were collected from 75 homestead fish farmers selected using purposive sampling technique through structured questionnaires and analyzed using descriptive statistics to determine biotechnical factors, challenges, production status and productivity of homestead aquaculture venture in the study area. The results showed that the biotechnical factors were well managed for homestead fish farming. The study revealed that 36% of the respondents have between 6-10 years of experience, while 46.7% engaged in this practice on a full-time basis, with 77.3% stocking only catfish. It was also observed that 44% of the respondents used concrete tanks for rearing fish, and 56% sourced water from borehole. The production status of aquaculture in the study area revealed that average pond was 3m by 2.5m by 1.4m (48%), with the remaining respondents having smaller sized ponds, stocking density was 1001-2000pcs by 41.3% of the respondents. Average fish output was 101-250kg per cycle as recorded by 46.7% of the respondents, only 49.3% of the respondents have active ponds, while others had moribund ponds (13.3%) and resting ponds (37.4%). Primary challenges faced included financial constraints (41.3%) and lack of quality fish feed (37.3%). Homestead fish farming in Ado- Ekiti can be further optimized, ensuring it remains a sustainable and profitable venture that contributes significantly to the socio-economic development of the region.

Introduction

Homestead fish farming is the rearing of fish on a small scale meant for subsistence use in controlled water body at home or backyard. This is an individual effort increasing of protein need of man, primarily for his family and as a source of income [1]. Fish farming, also known as aquaculture, has gained significant attention as a viable and profitable venture globally, contributing to food security, economic development, and poverty alleviation [2]. Small scale rural aquaculture, a type of aquaculture activity, has received significant attention in this respect, both in Sub-Saharan Africa (SSA) and abroad. In keeping with this, small-scale farms owned and managed by families account for more than 80% of worldwide aquaculture production [2]. Small scale farm enterprises comprise of a large proportion of aquaculture ventures in Nigeria that range from homestead concrete ponds (25-40m2) operated by individual farmer or family to small earthen pond (0.02-2.0ha) operated as part-time or off-season occupation by communities, institution, association or cooperative societies [3].

Despite the vast potential of homestead fish farming, there is a lack of comprehensive studies and practical implementation strategies in Ado-Ekiti. Challenges such as limited access to technical knowledge, inadequate infrastructure, and insufficient financial resources may hinder the successful establishment and operation of homestead fish farms in the region [4]. This research addressed these challenges by providing a thorough investigation into the feasibility and biotechnical factors of homestead fish farming in Ado-Ekiti.

Homestead fish farming has the potential to transform the socio-economic landscape of Ado-Ekiti, providing a sustainable

Citation: Fapohunda, Akinbamido. Biotechnical Factors of Homestead Fish Farming in Ado Local Government Area, Ekiti State, Nigeria. J Envi Sci Agri Res. 2026. 4(3): 1-4. DOI: doi.org/10.61440/JESAR.2026.v4.180

source of food security, employment opportunities, and income generation. The findings of this study can inform evidence-based policy decisions, guide local farmers in optimizing their practices, and contribute to the broader discourse on sustainable agriculture in Nigeria. Ado-Ekiti, the capital city of Ekiti State, is characterized by a diverse agricultural landscape, but there is a need to explore alternative and complementary sources of income for the predominantly agrarian community. The implementation of homestead fish farming can act as a catalyst for economic growth, given the region's favorable climate and abundant water resources.

Study Area

This study was conducted in Ado-Ekiti, a cosmopolitan city in Ekiti State, South-west Nigeria. Ado Ekiti is the state capital of Ekiti State with the population at 424,340 with Latitude 7 37 23.84" N and Longitude 5 13 15.13 E. It lies in the Yoruba Hills, at the intersection of roads from Akure, Ilawe Ekiti, Ilesha, Ila Orangun, and Ikare, and is situated 92 miles (148 km) east of Ibadan. An urban and industrial center of the region, it was founded by the Ekiti people, a Yoruba subgroup whose members belonged to the Ekiti-Parapo, a late 19th-century confederation of Yoruba peoples that fought against Ibadan for control of the trade routes to the coast. The people of Ado Ekiti are mainly of Ekiti sub ethic group of Yoruba.

Fishing activities in the state is majorly artisanal fishery in small scale sector and aquaculture production which scholars defined as the rearing of aquatic organisms under controlled or semi-controlled environments for the social and economic benefits of mankind and livestock. There are several homes that are involved in homestead fish farming in the study area.

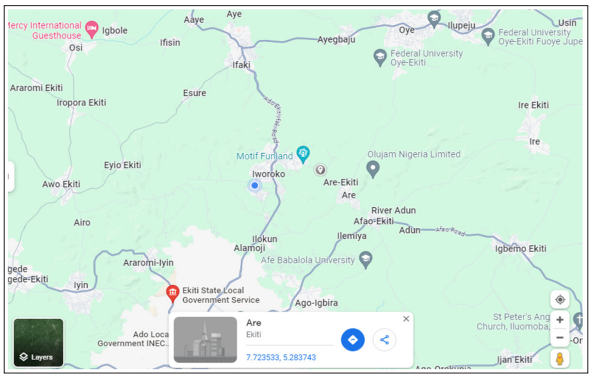

Figure 1: Showing the location of Ado-Ekiti
Source: Googleearth.com

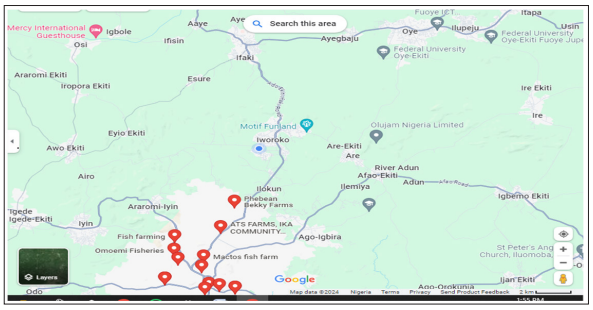

Figure 2: Location of homestead fish farms that are available in Ado Local Government
Source: Googleearth.com

Data Collection

This section was structured in sections in relation to the objective of the study and questions were arranged on a 5point Likert scale with 5 being the highest. Data were collected from two main sources; Primary and Secondary sources. The primary source of data collection was through well-structured questionnaires that were administered on the sample homestead fish farmers to obtain data. Secondary data were obtained from Fisheries Department of the State Ministry of Agriculture, bulletins, journals and periodicals.

Sampling Procedures and Sample Size

Purposive sampling techniques was used to access about 100 homestead fish farms around Ado-Ekiti local government, to assess the current status of homestead fish farming in Ado Ekiti, identify the biotechnical factors influencing the adoption and success of homestead fish farming as a profitable venture in Ado Ekiti. Out of the 100 sets of questionnaires distributed, only 75 were retrieved and used for the analysis.

Data Presentation and Analysis

The data collected were presented using descriptive methods; frequencies, tables and percentiles.

Results

Table 1: Biotechnical Factors of Homestead Fish Farmers in Ado Ekiti

Item		Frequency	Percentage (%)
How long have you been involved in Homestead fish Farmer	1-5years	20	26.7
	6-10years	27	36
	11-15years	16	21.3
	16-20years	10	13.3
	21-25years	2	2.7
	25 & above	-	-
	Total	**75**	**100.0**
What basis of fish farming is practiced	Full time	35	46.7
	Part time	40	53.7
	Total	**75**	**100.0**
What species of fish do you rear	Catfish	58	77.3
	Tilapia	7	9.4
	Both	10	13.3
	Others	-	-
	Total	**75**	**100.0**
What type of fish culture is practiced	Monoculture	52	69.3
	Polyculture	23	30.7
	Total	**75**	**100.0**
Type of pond	Concrete tank	33	44
	Earthen pond	17	22.7
	Drum/Plastic	15	20
	Fiber/Tarpaulin	10	13.3
	Total	**75**	**100.0**

Size of the pond	1m by 1m by 1m	10	10.3
	2m by 2m by 1m	29	38.7
	3m by 2.5m by 1.4m	36	48
	Total	**75**	**100.0**
Source of water	Reservoir	42	56
	Well	19	25.3
	Borehole	14	18.7
	Total	**75**	**100.0**
Current level of production	Active	37	49.3
	Moribund	10	13.3
	Resting	28	37.4
	Total	**75**	**100.0**
Current level of production	Active	37	49.3
	Moribund	10	13.3
	Resting	28	37.4
	Total	**75**	**100.0**
Constraints/ challenges	Financial problem	31	41.3
	Technical problem	6	8
	Environmental problem	5	6.7
	Fish feed problem	28	37.3
	Water quality problem	5	6.7
	Total	**75**	**100.0**
Ever received training or support	Yes	75	100
	No	-	-
	Total	**75**	**100.0**
Source of training	Government	14	18.7
	Colleague	18	24
	Farmer association	43	57.3
	Total	**75**	**100.0**
How many fingerling do you stock per cycle	500-1000pcs	9	12
	1001-2000pcs	31	41.3
	2001-3500pcs	20	26.7
	3500pcs & above	15	20
	Total	**75**	**100.0**
What is the average yield per cycle	5kg-20kg	5	6.7
	21-50kg	5	6.7
	51-100kg	14	18.6
	101-250kg	35	46.7
	250kg & above	16	21.3
	Total	**75**	**100.0**
How do you market your fish product	Farm gate	23	30.7
	Take to market	12	16
	To wholesalers	40	53.3
	Total	**75**	**100.0**
Major expenses incurred	Labour	8	10.7
	Water	4	5.3
	Security	16	21.3
	Feed	47	62.7
	Total	**75**	**100.0**
How do you perceive fish farming to other agricultural activities	Poultry	29	38.7
	Piggery	14	18.7
	Crop farming	32	42.7
	Total	**75**	**100.0**

Field Survey, 2024

Discussion, Conclusion and Recommendations

This study examined biotechnical factors affecting homestead fish farming practices in Ado Ekiti. Data from Table 1 revealed a range of years of experience, the largest number of respondents (36%) had been involved in fish farming for 6 to 10 years. This is followed by those (26.7%) with 1 to 5 years and 21.3% of the respondents who had 11 to 15 years of experience. Smaller proportions have been farming for 16 to 20 years (13.3%) and 21 to 25 years (2.7%). Regarding the basis of fish farming, about 53.3% of the respondent's farm on part-time basis, while the remaining 46.7% were engaged in full-time operations. Catfish is the predominant species reared (77.3%), while 13.3% of the respondents reared both catfish and tilapia, followed by 9.4% of the respondents farmed only tilapia.

In terms of fish culture practices, over half, 69.3% of the respondents reportedly practiced monoculture (raising a single fish species), while polyculture (raising multiple species together) was employed by 30.7% of the respondents. The study also investigated the types of ponds used. Concrete tanks were the most common, used by 44% of the respondents, followed by earthen ponds (22.7%), drums or plastics (20%), and fibre or tarpaulin (13.3%). Pond sizes varied, with the majority measuring 3 meters by 2.5 meters by 1.4 meters (48%). The primary water source for ponds was reservoirs (56%), well (25.3%) and 18.7% of the respondents depended on borehole. When considering operational status, nearly half (49.3%) of the respondents' farms were active. A smaller portion (13.3%) were classified as moribund (no longer actively producing), while 37.4% were in a resting phase.

Financial difficulties were identified as the main challenge faced by farmers (41.3%). Other challenges included fish feed issues (37.3%), technical problems (8%), environmental issues (6.7%), and water quality problems (6.7%). Encouragingly, all respondents reported receiving training and support. The most common source of training was from fish farmers' associations (57.3%), followed by colleagues (24%) and the government (18.6%). The number of fingerlings stocked per cycle varied. The largest group (41.3%) stocked 1001-2000 fingerlings. This was followed by those stocking 2001-3500 (26.7%), 3500 and above

(20%), and 500-1000 (12%). The average yield per cycle ranged from 5kg to over 250kg. The highest percentage of respondents (46.7%) achieved yields between 101-250kg. The most common marketing methods employed by farmers were selling directly at the farm gate (30.7%), taking fish to market themselves (16%), and selling to wholesalers (53.3%). Feed costs were the major expense incurred by farmers (62.7%), followed by security (21.3%), labor (10.7%), and water (5.3%). Interestingly, a significant portion of respondents (38.7%) perceived poultry to be more profitable than homestead fish farming. Additionally, 18.7% viewed piggery as more profitable, and 42.6% believed crop farming offered a higher return on investment.

Conclusion

The results showed that the biotechnical factors were well managed for homestead fish farming in Ado-Ekiti. The primary challenges faced by farmers are financial constraints and feed-related issues, which need to be addressed to enhance productivity. The support from farmer associations plays a crucial role in the success of homestead fish farming, highlighting the need for continuous training and knowledge dissemination. Homestead fish farming in Ado- Ekiti can be further optimized, to ensure it remains a sustainable and profitable venture that contributes significantly to the socio-economic development of the region.

Recommendations

The study recommends that several strategic actions be taken to enhance the viability and profitability of homestead fish farming in Ado-Ekiti by enabling the effective utilization of the biotechnical factors of homestead fish production.

Firstly, it is imperative to implement financial support schemes and improve access to credit for homestead fish farmers to alleviate financial constraints and enable expansion of operations. Encouraging local production of affordable and high-quality fish feed is essential, and government policies should focus on providing subsidies for fish feed to reduce production costs.

Additionally, enhancing training programs and extension services is crucial to equip farmers with the latest techniques in fish farming, water quality management, and disease control. Investing in infrastructure development, such as reliable water sources and efficient pond systems, will support sustainable fish farming practices.

Encouraging research on sustainable fish farming practices and the development of resilient fish species suited to local conditions is vital. Continuous research can help address emerging challenges and improve productivity.

Improving market access for fish farmers is necessary by establishing cooperative marketing structures and promoting value addition activities such as fish processing and packaging to increase profitability.

Furthermore, formulating and implementing supportive government policies that promote homestead fish farming, including tax incentives, grants, and technical support programs, is essential. By addressing these recommendations, homestead fish farming in Ado-Ekiti can be further optimized, ensuring it remains a sustainable and profitable venture that contributes significantly to the socio-economic development of the region.

Acknowledgements

I acknowledge the support of given to us by Tunji Olowolafe Foundation and Ekiti State University, Ado for giving us the enabling environment during the course of the research and sponsoring me to Aquaculture America 2026 in Las Vegas. Thank you

References

1. Fapohunda OO. Biotechnical factors affecting aquaculture production in Ondo State, Nigeria. Journal of Agriculture and Rural Development. 2011. 6: 9-22
2. Mulokozi DP, Mmanda FP, Onyango P, Lundh T, Tamatamah R, et al. Rural aquaculture: Assessment of its contribution to household income and farmers' perception in selected districts, Tanzania. Aquaculture Economics & Management. 2020. 24: 387-405.
3. Alfred-Ockiya JF, Otene BB, Idaso NQ. Socio-economic analysis of fish farming in Andoni Local Government Area of Rivers State, Nigeria. International Journal of Agriculture and Earth Science. 2024. 10: 12-25.
4. Dutta M, Kalita B, Hussain S, Bhagawati K. Constraints in Adoption of Scientific Fish Farming in Nagaon District, Assam. Indian Journal of Extension Education. 2022.