

Research Article

Comparative Analysis of Fish Farmers' Knowledge of Basic Fish Farming Practices in Lagos and Osun States, Nigeria

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Abstract

Without targeted educational programmes and resources to enhance their knowledge base, fish farmers may miss out on the benefits of improved practices, which could ultimately threaten their livelihoods and the sustainability of fish farming as a whole. The study conducts a comparative analysis of fish farmers' knowledge of basic fish farming practices in Lagos and Osun States. The population of the study consists of all registered fish farmers in Lagos and Osun States, Nigeria. A multistage sampling procedure was employed for the selection of 300 respondents for this study. The data for this study was collected from the respondents using a well-structured questionnaire and interview schedule while the data obtained was subjected to both descriptive and inferential statistical tools. Descriptive statistical tools employed include; frequency counts, percentages, means and weighted mean score (WMS) while the inferential statistical tool was a t-test. The finding shows that knowledge related to basic fish farming practices were sourced primarily from government agricultural extension agencies, experienced fish farmers, academic research journals and scientific publications and fisheries cooperatives and associations and lack of readily available, relevant and reliable information, limited internet access and digital literacy, financial constraints, lack of access to extension services and time constraints were the constraints to acquiring knowledge on basic fish farming practices. The t-test result shows that there was no significant difference in the fish farmers' knowledge level of basic fish farming practices in Lagos and Osun States. It was recommended that easily understandable, locally relevant information materials in local languages, addressing specific challenges faced by the fish farmers be developed and disseminated to the fish farmers and such materials should be visually engaging and minimize technical jargons.

Keywords

Comparative Analysis, Fish Farmers, Knowledge, Basic Fish Farming Practices

1. Introduction

Nigeria has large population of fish consumers with a total consumption of more than 3.2 million metric tons while fish imports make up about 2.1 million [7]. This ever-increasing demand for fish is due to a number of factors such as high population, growth rate, increasing national income and in-

creasing costs of other sources of animal protein such as livestock. Fishery occupies a very significant position in the primary sector, providing employment for over a million people in Nigeria particularly the riverine communities [3]. Interestingly, fish cultivation offers a major source of animal

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protein and contributes heavily to household diets, livelihood, and economic development in many countries and regions of the world [19]. Nigeria is not left out. In the agricultural sector of the Nigerian economy, fish farming has been recorded as having the fastest growth rate. Fish accounts for nearly 40% of Nigeria's protein intake, as fish consumption hovers between 11.2 and 13.3 kg/person/per year [4, 5, 40, 41, 30]. Still, Nigeria's per capita protein intake is lower than the Sub-Saharan African average. Importantly, fish is cheaper than other sources of animal protein [12]. Fish farming is an important constituent of global food security and aquatic ecosystem management. Fish farming, on the other hand, is considered a key agricultural sector of food production all over the world. It is viewed as a crucial agricultural activity that can reduce nutritional deficiencies considerably on a global scale and therefore reduce poverty effectively [27].

Fish farming is one of the fastest-growing food production sectors worldwide. According to food and agriculture organization (FAO), fish farming provided more than 50% of the fish consumed globally in 2020, making it a crucial component of food security and economic development for many communities [19]. However, the sustainability and productivity of fish farming heavily depends on the farmers' knowledge and application of basic fish farming practices and basic practices include water quality management, feeding techniques, breeding methods, disease control and environmental sustainability. In many developing countries, knowledge among fish farmers can be limited due to a lack of access to education and extension services, posing significant challenges to effective fish farming. Research has shown that inadequate knowledge can lead to suboptimal farming practices which in turn affect fish yield and quality [22]. Consequently, improving fish farmers' knowledge is essential for sustainable development and can lead to significant economic benefits for the farming communities. Similarly, despite the growing importance of fish farming, many fish farmers still lack comprehensive knowledge of basic practices. The gap in knowledge can result from multiple factors including limited access to training, inadequate education resources and a lack of supportive policies for the industry. [33] opined that farmers with minimal training often experienced higher fish loss rates due to disease and poor feeding practices compared to those with formal training. Moreover, the farmers' understanding of the environmental impacts of overfishing, pollution and the introduction of non-native species remains insufficient.

This lack of awareness can lead to unsustainable practices that threaten the health of aquatic ecosystem [14]. Additionally, many smallholder farmers are unaware of the latest technologies and methods available for improving fish farming, contributing to low productivity and economic viability [31]. Without targeted educational programmes and resources to enhance their knowledge base, fish farmers may miss out on the benefits of improved practices, which could ultimately threaten their livelihoods and the sustainability of fish farming as a whole. The knowledge and skills of the fish farmers directly

influence the success of fish farming operations. Studies have shown that knowledge in areas such as fish health management, feed formulation, water quality management and breeding practices significantly impacts fish yields and farm profitability [16]. An informed farmer is more likely to adopt best practices, mitigate risks and enhance the overall performance of fish farming systems [39]. The role of agricultural extension services is pivotal in increasing farmers' knowledge. Programmes aimed at providing training on fish farming techniques can elevate the understanding of best practices. [6] highlights how participatory extension approaches that involve farmers in the learning process not only improve knowledge but also bolster community resilience through shared learning. Comparative analyses of fish farmers' knowledge often reveal significant variations influenced by geographic location, socioeconomic status and access to extension services. For instance, rural farmers may have limited access to modern techniques, reliant instead on traditional practices which may not be as effective in ensuring high yields [23] while in contrast farmers in developed regions often benefit from better access to training and resources, leading to higher levels of knowledge about advanced fish farming practices [28].

Also, studies comparing knowledge among different groups of fish farmers often focus on various demographic aspects such as age, educational level and experience. According to [44], younger farmers with higher educational attainment exhibited greater knowledge of sustainable fish farming practices compare to older farmers with less formal education. Despite, the apparent benefits of increased knowledge among the fish farmers, several challenges persist. Inadequate infrastructure, limited financial resources and cultural barriers can hinder the dissemination of knowledge. [45] posited that farmers in underrepresented regions often face significant barriers in accessing information, limiting their ability to implement improved fish farming practices effectively. Despite, the amazing benefits embedded in the fishing sector, most of the fish farmers were constrained because of lack of understanding of the benefits embedded in the application of improved aquaculture practices [8]. As such, this study therefore intends to analysis the fish farmers' knowledge of basic fish farming practices between the fish farmers in Lagos and Osun States. Specifically, the study aims to describe the fish farmers' socioeconomic characteristics, assess the knowledge level of basic fish farming practices among the fish farmers, identify the primary sources of knowledge on basic fish farming practices and identify the constraints to acquiring knowledge on basic fish farming practices. It was hypothesized that there is no significant difference in the fish farmers' knowledge level of basic fish farming practices in Lagos and Osun States.

2. Methodology

This study was conducted in Lagos and Osun States, which are located in the south western part of Nigeria. Lagos State

occupies 3,345 square kilometres and shares boundaries with Ogun State in the north and east. It is bounded on the west by the Republic of Benin, and in the south, it stretches for 180 kilometres along the coast of the Atlantic Ocean; Osun State has Osogbo as its state capital, occupies an area of land of about 14,875 square kilometres and shares boundaries with Kwara State in the north, in the east partly by Ekiti State and Ondo State, in the south by Ogun State and the west by Oyo State. The 2 States are essentially a Yoruba speaking environment, mostly farmers producing food crops such as yam, maize, cassava, cowpea and cocoyam, while other income-generating activities also abound in the 2 States. The study population consists of all male and female registered fish farmers in table-size fish farming using functional fish farms in Lagos and Osun States, Nigeria. A multistage sampling procedure was employed to select respondents for this study. In the first stage, two states were randomly chosen from

states constituting South western Nigeria, namely Lagos and Osun states. In the second stage, a simple random sampling technique was used to select four fishing zones from Lagos (Western and Eastern zones), and Osun (Osogbo and Ife/Ijesha zones) states out of the six (6) zones, in the two (2) states. A list of registered fish farmers in Lagos (552) and Osun states (445) was obtained from the Agricultural Development Programmes in the selected states. Lastly, a random selection of thirty percent (30%) of the total number of registered fish farmers was selected from each State i.e. 166 fish farmers from Lagos State and 134 fish farmers from Osun State thus making a total of three hundred (300) fish farmers that constituted the sample size for the study. Primary data was collected using a well-structured questionnaire and interview schedule. Data was analysed using descriptive and inferential statistical (t-test) tools to test the stated hypothesis.

3. Results and Discussion

3.1. Fish Farmers' Socioeconomic Characteristics

Table 1. Distribution of Respondents by Socioeconomic Characteristics.

Characteristics	Lagos State (n=166)	Osun State (n=134)
Sex		
Male	98(59)	92(68.7)
Female	68(41)	42(31.3)
Age (yrs)		
<30	2(1.2)	Nil
30-39	37(22.3)	33(24.6)
40-49	64(38.6)	73(54.5)
50-59	58(34.9)	24(18)
60>	5(3.0)	4(2.9)
Mean	47yrs	44yrs
Marital status		
Single	12(7.2)	8(5.9)
Married	151(91)	107(79.9)
Divorced	3(1.8)	13(9.7)
Widowed	Nil	6(4.5)
Household size		
1-2	14(8.4)	15(11.1)
3-4	59(35.5)	40(29.9)
5-6	62(37.4)	65(48.5)
7>	31(18.7)	14(10.5)

Characteristics	Lagos State (n=166)	Osun State (n=134)
Mean	5	5
Years spent in formal school		
No formal education	2(1.2)	2(1.5)
1 to 6	18(10.8)	2(1.5)
7 to 12	60(36.2)	59(44.1)
13>	86(51.8)	71(52.9)
Mean	14yrs	14yrs
Fish farming experience		
<10	83(50)	78(58.2)
10 to 14	48(28.8)	45(33.6)
15 to 19	19(11.5)	10(7.5)
20>	16(9.6)	1(0.7)
Mean	9.5yrs	8.4yrs

Percentage (Figures in parenthesis)

Source: Field Survey, 2024

It could be seen in Table 1 that in Lagos State, 59% of the respondents were males while 41% were females and in Osun State, 68.7% of the fish farmers are males while 31.3% are females. This indicates that fish farming in the study areas is male dominated. This result is in conformity to [2] report of more male fish farmers than females. This result is also in line with [35] that the male gender engaged in fish farming than the female gender. This finding is in line with the report of [47] that fish farming is male dominated enterprise. The results presented in Table also revealed that in Lagos State, 38.6% the fish farmers were between the age range of 40-49 years while 34.9% were between the age range of 50-59 years and 22.3% of them were between 30-39 years. Also, 1.2% are below 30 years and 3% are 60 years and above with a mean age of 47 years. Similarly, in Osun State, 54.5% of the fish farmers were between the ages of 40-49 years while 18% were between 50-59 years, 24.6% falls within the age range of 30-39 years and 2.9% were 60 years and above with a mean age of 44 years. This indicates that majority of the respondents in Lagos State (62.6%) and Osun State (66.6%) were less than 50 years of age hence considered as productive, economically active, able-bodied and agile young men and women who possessed the physical strength to sustain rigorous and arduous tasks required in fish farming. The study finding is in tandem with the report of [10, 36] that fish farmers mean age was 44 years and 47 years. Similarly, majority (91%) of the respondents in Lagos State were married while 7.2% were single and 1.8% was divorced. Also, in Osun State, 79.9% of the fish farmers were married, 9.7% divorced, 5.9% single while 4.5% were widowed. This implies that fish farming the study areas was dominated by married respondents. The finding is in line with the report of [26] that majority of the

fish farmers in the study area was married. Further result presented revealed that 37.4% fish farmers in Lagos State had household size of between 5-6 people, while 35.5% of them had household size of between 3-4 people, 18.7% had household size of 7 people and above and 8.4% had household size of between 1-2 people with the mean household size of 5 people. Also, 48.5% of the Osun State fish farmers had household size of between 5-6 people, 29.9% had household size of between 3-4 people while 14% had household size of 7 people and above and 11.1% had household size of between 1-2 people with a mean household size of 5 persons. This implies that the respondents in the study areas had medium-size household which shows the availability of family labour to assist in the fish farming business. This finding corroborates the report of [43] that fish farmers mean household size was 5 persons. Also similar to the finding of [2] that most fish farmers have a family size of between 3 and 5. Also, it could be seen that 51.8% of the fish farmers in Lagos State spent 13 years and above in formal school while 36.2% spent between 7-12 years and 10.8% spent between 1-6 years with 14 years as the mean year spent in formal school. Similarly, 52.9% of the respondents in Osun State spent 13 years and above in formal school while 44.1% of them spent between 7-12 years and 1.5% spent between 1-6 years and 14 years as the mean year spent in formal school. This indicates that majority of the respondents in Lagos (98.8%) and Osun State (98.5%) spent a significant number of years having formal education. This finding negates the reports of [24] that majority of fish farmers had 16 years of formal education and that of [9] that the fish farmers spent above 15 years in school. As shown in Table 1, 50% of the fish farmers in Lagos State had less than 10 years of experience in fish farming, 28.9%

had between 10 to 14 years of experience while 11.5% had between 15 to 19 years of experience and 9.6% had 20 years of experience and above with 10 years as the mean years of experience. Similarly, 58.2% of the fish farmers in Osun State had less than 10 years of experience, 33.6% had between 10 to 14 years of experience while 7.5% had between 15 to 19 years of experience and 0.7% had 20 years of experience and above with 8 years as the mean years of experience. This indicates that with the respondents' years of experience is quite encouraging as most of them have been in the business for a long time hence, they should have good skills and better approaches to fish farming business. The finding supports the reports of [21, 25] that the mean farming experience of fish farmers was between 8 years and 9 years respectively.

3.2. Knowledge Level of Basic Fish Farming Practices Between the Fish Farmers

Result presented in Table 2 show that 92.2% of the fish farmers in Lagos State were highly knowledgeable about the fish farming practices while in Osun State, 99.3% of the fish farmers were highly knowledgeable about the fish farming

practices. This implies that the fish farmers' both study areas have a better understanding of the basic fish farming practices. Fish farmers with a high level of knowledge about basic fish farming practices are likely to have a better understanding of the type and quality of the information they need. They can better evaluate the credibility and relevance of the media sources thereby leading to more selective use of the media channels that provide reliable and accurate information. Also, with a deeper understanding of the basic fish farming practices, these farmers may have diverse media consumption and this media consumption diversification may broaden their knowledge and allow them to stay updated on the latest development, best practices and technological advancements and are more likely to critically analyse and interpret the information they receive from various media sources which will enable them to make informed decisions, adapt the farming practices and adopt innovative techniques. This finding agrees with the work of [38] that the knowledge of the fish farmers was relatively high while it negates the findings of [37] that majority of the fish farmers had low level of knowledge of fish farming practiced.

Table 2. Categorization of respondents by knowledge level of basic fish farming practices.

Category	Score's range	Lagos State (n=166)	Osun State (n=134)
High	18-26	153(92.2)	133(99.3)
Moderate	9-17	8(4.8)	Nil
Low	0-8	5(3)	1(0.7)
Mean		8.67	6.35
Standard Deviation		4.172	4.518

Percentage (Figures in parenthesis)

Source: Field Survey, 2024

3.3. Primary Sources of Knowledge on Basic Fish Farming Practices

Table 3 shows that the primary sources of knowledge on basic fish farming practices in Lagos State were government agricultural extension agencies (WMS=1.99), experienced fish farmers (WMS=1.98), academic research journals and scientific publications (WMS=1.97) and fisheries cooperatives and associations (WMS=1.96) while in Osun State, experienced fish farmers (WMS=2.04), fisheries cooperatives and associations (WMS=1.90), academic research journals and scientific publications (WMS=1.89) and government agricultural extension agencies (WMS=1.73) were the common primary sources of knowledge on basic fish farming practices. This indicates that in the study areas, knowledge

related to basic fish farming practices were sourced primarily from government agricultural extension agencies, experienced fish farmers, academic research journals and scientific publications and fisheries cooperatives and associations. This implies that the local extension agents and experienced fish farmers provide immediate, practical and context-specific advice as such tailor recommendations to local conditions which is particularly crucial for small-scale farmers. Cooperatives and associations create platforms for sharing practical experience among the fish farmers, this knowledge transfer, often build on trial and error can be very effective in improving practices and fostering innovation. Experienced fish farmers and cooperatives can provide valuable feedback to the academic research, this feedback helps researchers to understand real-world challenges and design more relevant and effective interventions, research can then be more impactful if

grounded in existing local knowledge. Government extension services and cooperative initiatives can provide training and support for aspiring fish farmers, effectively transferring the accumulated knowledge base to the next generation. Empowering local communities by providing them with readily accessible, relevant and trustworthy information can contribute to a more sustainable and resilient aquaculture sector which could help in reducing dependence on external experts and promoting local innovation. This finding is in tandem with the report of [11] that agricultural extension services are crucial source of that facilitate the access to and proliferation of knowledge among the fish farmers. Also, [20] reported that

peer-to-peer learning can be effective and influential in sharing knowledge among experienced fish farmers and can significantly impacts knowledge transfer, allowing novice farmers to adopt practical and locally-adapted farming methods efficiently. Similarly, [1] pointed out that fisheries cooperatives is significantly important to the development and sustainability of aquaculture in Nigeria as its play a pivotal role in facilitating knowledge exchange among members as the cooperatives serve not only as a platform for pooling resources but also as channels for training and disseminating technical knowledge on fish farming practices.

Table 3. Distribution of respondents by primary sources of knowledge on basic fish farming practices.

Primary sources of knowledge	WMS	Rank	WMS	Rank
Government agricultural extension agencies	1.99	1 st	1.73	4 th
Academic research journals and scientific publications	1.97	3 rd	1.89	3 rd
Non-governmental organizations	1.79	9 th	1.62	8 th
Fisheries cooperatives and associations	1.96	4 th	1.90	2 nd
Books and manuals	1.89	8 th	1.55	9 th
Online resources	1.93	7 th	1.65	6 th
Experienced fish farmers	1.98	2 nd	2.04	1 st
Government agricultural and fisheries departments	1.94	6 th	1.66	5 th
Workshops and training programmes	1.95	5 th	1.64	7 th

Lagos State (n=166) Osun State (n=134)

WMS: Weighted Mean Score

Source: Field Survey, 2024

3.4. Constraints to Acquiring Knowledge on Basic Fish Farming Practices

Table 4 reveals that in Lagos State, the constraints to acquiring knowledge on basic fish farming practices include lack of readily available, relevant and reliable information (WMS=2.61), limited internet access and digital literacy (WMS=2.54), financial constraints (WMS=2.48) and lack of access to extension services (WMS=2.40) while in Osun State, limited internet access and digital literacy (WMS=2.51), lack of readily available, relevant and reliable information (WMS=2.34), financial constraints (WMS=2.21) and time constraints (WMS=2.20) were the constraints to acquiring knowledge on basic fish farming practices. This indicates that lack of readily available, relevant and reliable information, limited internet access and digital literacy, financial constraints, lack of access to extension services and time constraints were the constraints to acquiring knowledge on basic fish farming practices. This implies that without access to

reliable information, fish farmers are less likely to adopt improved farming which could lead to lower yields, increased mortality rates and reduced profitability and may continue as a result of outdated or less efficient methods. The lack of knowledge can lead to higher input costs which can push the fish farmers out of business, especially small-scale fish farmers with limited financial buffers and are also less able to bargain for better prices for inputs or outputs. Without proper knowledge on sustainable fish farming practices, the fish farmers might engage in environmentally damaging practices. Inefficient and unsustainable fish farming practices ultimately impact food security, particularly in communities relying on fish as a primary protein source thus, reduced production due to knowledge gaps translates to less available fish and consequently impacting local food supply. These constraints disproportionately affect the small-scale fish farmers, women and marginalized fishing communities who often have limited access to resources and support and this further widens the existing inequalities within the aquaculture sector. This finding is in line with the report of [18] that many small-scale

fish farmers face financial limitations that hinder their ability to invest in training and resources. [32] reported that time limitations are a significant barrier, especially for farmers balancing multiple responsibilities. [34, 17, 42, 46] reported that inadequate extension services such as lack of site visit by extension worker, limited number of publications and lack of proper training directly contribute to a lack of practical knowledge among the fish farmers. Likewise, [13] reported

that limited access and low digital literacy rates restrict fish farmers from utilizing e-learning platforms and online databases which could enhance their farming practices and [15] reported that the scarcity or little access to agricultural information, expressivity of the information sources, pertinent and trustworthy information resources on fish farming leads to misinformation and suboptimal farming practices among smallholder farmers.

Table 4. Distribution of respondents by constraints to acquiring knowledge on basic fish farming practices.

Constraints to acquiring knowledge	WMS	Rank	WMS	Rank
Limited internet access and digital literacy	2.54	2 nd	2.51	1 st
Lack of readily available, relevant and reliable information	2.61	1 st	2.34	2 nd
Financial constraints	2.48	3 rd	2.21	3 rd
Language barriers	2.25	8 th	2.09	7 th
Low literacy level	2.36	6 th	2.06	8 th
Lack of prior experience	2.37	5 th	2.13	6 th
Insufficient practical training	2.21	10 th	2.02	9 th
Poverty and limited resources	2.27	7 th	1.97	11 th
Time constraints	2.24	9 th	2.20	4 th
Lack of access to extension services	2.40	4 th	2.15	5 th
Gender inequality	2.14	11 th	1.78	14 th
Lack of government support	2.09	13 th	1.99	10 th
Weak regulatory framework	2.12	12 th	1.93	13 th
Limited coordination among stakeholders	2.07	14 th	1.96	12 th

Lagos State (n=166) Osun State (n=134)

WMS: Weighted Mean Score

Source: Field Survey, 2024

3.5. Hypothesis Testing

There is no Significant Difference in the Fish Farmers'

Knowledge of Basic Fish Farming Practices in Lagos and Osun state.

Difference in the Fish Farmers' Knowledge of Basic Fish Farming Practices in Lagos and Osun State.

Table 5. Summary of t-test analysis showing the difference in the fish farmers' knowledge of basic fish farming practices in Lagos and Osun State.

Variable	Mean	t-value	p-value	Decision
Fish farmers' knowledge of basic fish farming practices between fish farmers in Lagos and Osun State	48.98 42.85	0.682	0.128	Not significant

Significant at 5% level of significance

The t-test result presented in Table 5 shows that there was no significant difference in the fish farmers' knowledge level

of basic fish farming practices in Lagos and Osun States. The t-value ($t=0.682$, $p=0.128$) shows that there is not sufficient evidence to reject the null hypothesis in favour of the alternative hypothesis within the context of the study. Comparatively, this implies that an insignificant difference in the knowledge levels shows that the similarity in knowledge level reveals that the current training and educational programmes about fish farming practices may not be effectively tailored to the unique context of each State. Likewise, the fish farmers in both States may be employing similar, possibly suboptimal management practices. Also, given the similarity in knowledge, investments in extension services or training programmes can be strategically targeted to areas that need improvement thus staff training, resource support or even tailored materials could be deployed equally across both States to elevate overall knowledge. The insignificant difference in the fish farmers' knowledge level of basic fish farming practices between Lagos and Osun States suggests that both study areas grapple with a comparable set of challenges that impact their fish farming productivity. This finding is in tandem with the report of [29] that comparative analysis of the fish farmers' knowledge levels of basic fish farming practices illustrates that farmers with comparable knowledge level in the study areas contend with similar environmental, regulatory and market challenges which significantly shape the fish farmers productivity.

4. Conclusion and Recommendations

In conclusion, the comparative analysis reveals a paradox while the high knowledge level on basic fish farming practices exists within the various sources such as government agricultural extension agencies, experienced fish farmers, academic research journals and scientific publications and fisheries cooperatives and associations, many fish farmers lack access to and application of this knowledge. The knowledge gap is primarily due to constraints related to information access (limited internet access and digital literacy, lack of readily available, relevant and reliable information and financial limitations). The readily available knowledge is not effectively translating into improved practices on the ground which highlights a critical failure in knowledge dissemination and transfer rather than a fundamental lack of knowledge itself thus, to bridge the knowledge gap and improve fish farming practices, a multi-pronged approach is needed thus it was recommended that;

- 1) Government agricultural extension agencies should focus on targeted, practical training programmes delivered directly to the farmers considering their specific needs and literacy levels.
- 2) Fisheries cooperatives and associations should be strengthened and empowered to become crucial channels for disseminating knowledge and providing support to their members. Training should be provided to cooperative leaders on effective knowledge sharing techniques.

niques.

- 3) Development and dissemination of easily understandable, locally relevant information materials in local languages, addressing specific challenges faced by the fish farmers. These materials should be visually engaging and minimize technical jargons.
- 4) Creation of user-friendly, localized online platforms or portals with reliable and relevant information on fish farming practices which could offer forums for Q&A and farmer-to-farmer knowledge sharing.
- 5) Provision of training programmes to enhance digital literacy among the fish farmers enabling them to access and utilize online resources effectively.
- 6) Provision of subsidies on essential inputs to make improved fish farming practices more affordable.

Abbreviations

FAO Food and Agriculture Organization

WMS Weighted Mean Score

Author Contributions

Oyelayo Abisegun Akinboye is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The author declares no conflicts of interest.

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