



Significance of Regulated and Quality Feed On Fish Production

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Abstract

Cost-effective, healthy, and high-quality animal production relies heavily on proper nutrition. Increasing availability of high-quality feed is essential for productive aquaculture operations. It's important to avoid both underfeeding and overfeeding fish. Therefore, aquaculture operations should inquire about recommended feed. The calibre of the feed that is produced is influenced by the methods used to produce it. The impact of regulated and high-quality feed on fish production in Nigeria was analysed descriptively. The researcher examined the lives of Lagos's fish farm owners and cultivators. Since the researcher is unable to foresee the size or distribution of this subset of responders, he used the snowball sampling technique to locate the respondents. The study location was Ajegunle-Apapa area in AjeromiIfelodunLocal government area of Lagos state. The study's sample size was 100 fish farmers. The self-made questionnaire was adopted for data collection which was physically distributed. The information was presented in the form of charts, frequency tables, and percentages. The result from the analysis indicated that fish farmer comprises both male and female of all age, level of education, and experience. The study identified some of the challenges affecting the adoption of balance and quality fish feed in the study area and found that lack of resources, high fish feed prices, disruptions in the supply chain, theft of produce and feed ingredients, a lack of appropriate technological innovations, inadequate capabilities and skills, and a lack of knowledge of feed formulation, processing, handling, and storage all contribute to the widespread disregard for established procedures and guidelines. The result also indicated that high-quality fish feed enhances production as well as the growth of the aquaculture sector and thus recommended the adoption of regulated and quality fish feed by fish farmer to enhance fish production.

Keywords: Fish farmer, regulation, quality feed

I. Background to the study

Over the last decade, advances in polyculture farming technology and nutritionally adequate formulated diets have allowed aquaculture to expand from its traditional confines into open water for extensive, enhanced extensive, and semi-intensive production methods (Hasan, 2001). Hasan (2001) argues that the growth of small-scale pond aquaculture presents developing nations with a chance to increase their contribution to global aquaculture output. Consistent production and refinement of fertilisers and feed supplies is essential to sustaining aquaculture growth, which is also dependent on nutrition and feeding. For aquaculture to be environmentally and socially sustainable, it must be developed in a way that takes into account the requirements of consumers (Hasan, 2001).

Given the anticipated shortage in aquatic food items, aquaculture is seen as a viable alternative to fisheries expansion and enhancement. It is widely agreed that aquaculture is our best hope for replenishing depleted ecosystems and expanding fishery resources (Okechi, 2004). The cost, development, and availability to quality feed supplies; rivalry from other users of the sector; and inadequate supply and demand are only some of the obstacles to sustainable aquaculture production in both developed and developing nations.

No matter what kind of fish farming setup is used, the success of the fishery ultimately hinges on the calibre and amount of the nutrients given to the fish (Hasan, 2001). Many people eat fish because of its high protein content and other health advantages. Polyunsaturated fatty acids (PUFA) included in this food are thought to help prevent illnesses including heart disease, cancer, psoriasis, and breast and colon cancer (Kaushik, 2000). It has beneficial effects on human health because to the micronutrients it contains, including as iodine, selenium, and fat-soluble vitamins. So, if we can improve the nutritional standards in aquaculture, we may potentially improve the nutritional value of the fish we eat. The reason for this is because the



nutritional quality and feed has an impact on the smell, colour, and taste of the food (Hasan, 2001). The purpose of this study is to examine the importance of regulated and quality feed on fish production in order to allow the elimination of negative effects and provide a positive environment, given the preceding evidence that feed is an essential source of nutrients in fish aquaculture.

Statement of research problem

Although there are many positive outcomes that may result from developing aquaculture, some people are worried about things like the feed quality and the effect it has on the environment (Kong, et al., 2020). With so many people living in poverty, it has been difficult to achieve the FAO's predicted 60% increase in fisheries and aquaculture productivity (FAO, 2014). (FAO, 2018). Despite the population growth threat, this industry has flourished, and it now provides more than half of the world's fish for human consumption (Bush and Oosterveer, 2019). This boom in aquaculture has led to a rise in the demand for fish food (Munguti, 2021). Expanding use of high-quality feeds and effective feeding management methods has been connected to rising aquaculture output (FAO, 2018). Hasan and New (2013) shared this view, arguing that the quality of feed components has a major impact on feed performance. Therefore, the viability of the aquaculture business relies heavily on the accessibility of cheap and high-quality materials that can be efficiently processed into feeds. Many fish farmers don't know that poor fish feed quality is caused by a combination of issues, including improper handling, improper transportation procedures, and improper fish feed storage, all of which increase the likelihood of infection by fungus and cause insect infestation (Awity, 2013). Given the aforementioned, this research looks at how much of an impact regulated, high-quality feed has on fish output.

Research aim and objectives

The aim of this research is to examine the significance of regulated and quality feed on fish production. Specifically, the study seeks to

- i. Identify the challenges of fish farmers in obtaining quality feeds
- ii. Assess the impact of using quality feed on fish production
- iii. Determine the extent to which the regulation of quality fish feed enhance aquaculture development

Research questions

- i. What are the challenges of fish farmers in obtaining quality feeds?
- ii. What is the impact of using quality feed on fish production?
- iii. To what extent will the regulation of quality fish feed enhance aquaculture development?

II. Literature Review

In order to produce safe, high-quality items, proper nutrition in animal production systems is crucial. Feed accounts for about half of the entire variable production cost, making optimal nutrition a key component of aquaculture operations. Because of this, the study of fish nutrition has grown to include the development of unique, balanced commercial diets aimed specifically at promoting fish growth. Therefore, fish nutritionists need to take a stand beyond just designing diets rich in nutrients and low in waste (Hasan, 2001).

Many developing countries have seen tremendous growth in their aquaculture sectors during the last decade. Thus, aquaculture has been significantly aiding in both food security and the battle against poverty. Increases in aquaculture production throughout the globe are anticipated to contribute to the satisfaction of these needs. Since proper nutrition and feeding are essential for the continued success of aquaculture, these resources continue to take precedence. Since much of the expected increase in aquaculture production in developing Asian and African countries will be done via the expansion of semi-intensive, small-scale pond culture, the availability and cost of feed and fertiliser supplies may be the primary barriers to this development (Hasan, 2001).

Fish feed and nutrition

Nutrition and feeding practises play a pivotal role in aquaculture since they significantly affect fish productivity. Fish diets that are high in nutrients are a great way to increase output. Alternative plant-based ingredients like cassava, soybean meal, cottonseed meal, corn starch, and rapeseed meal have been considered to replace fish meal in the fish diet in order to reduce fish feed cost without causing a change in the nutritional profile, as part of on-going research aimed at developing cost-effective feed for enhancing fish production. Fish feeding calls for knowledge of not just fish digestion but also fish nutrition as a whole. Fish need the energy provided by the fish they eat so that they can develop, move around, and have offspring.



Empirical Review

Fish feeds in Kenya were studied by Munguti et al. (2021), who also looked at the industry's current state, feed management techniques, and the industry's potential challenges and future prospects. According to the results, feed management strategies have a major bearing on the financial success of fish farming. It was determined from this research that effective feed management technology and feeding techniques are crucial for achieving maximum output in the aquaculture industry. Inadequate understanding of feed formulation, processing, handling, and storage; restricted resources; and a lack of acceptable technology advancements are just some of the difficulties fish farmers confront, according to the report. These difficulties reduce potential investments that may improve the viability and sustainability of the fish feed processing industry, making it harder to meet the growing demand for fish food.

Hasan (2001) surveyed the many factors—including fish nutrient requirements, feed resource availability, realistic farming conditions, feed availability and its impact on demand and supply forecasts for marine resources, and the long-term viability of aquaculture systems—that influence aquaculture's nutritional foundations and, ultimately, its yield. Concerns including the impact of diet on fish quality, the ability of fish to ward against illness, and the creation of regional nutritional databases for aquaculture expansion were also recognised and explored.

Prabu, Felix, Ahilan, and Ruby (2017) analysed the relevance of fish nutrition in the aquaculture business. The research found that nutrient-rich, high-quality, artificial feeds that are low in pollution and expense are feasible for long-term production of aquatic species. The research showed that aquatic creatures need forty different nutrients, including minerals, vitamins, fatty acids, protein, and carbohydrates, for development and energy. The research also showed that using well-balanced meals may lead to high-quality fish output.

Theoretical framework

The idea behind the Theory of Access is that individuals may have access to a variety of resources, but be unable to make full use of them because of underlying systemic constraints (Ribot & Peluso, 2003). For this reason, the theory requires that organisations and people be given the chance to enhance their productivity through gaining access to resources and creating secure economic foundations. So that its advantages may be utilised to achieve specified goals, it is necessary to identify the elements that increase production in aquaculture. Because of food instability and inability to progress, fish producers are particularly vulnerable when their resources are constrained.

III. Methodology

The descriptive research survey method was adopted in examining the significance of regulated and quality feed on fish production in Nigeria. The population of the study comprises all fish pond owners and fish farmers in Lagos state. Since the researcher cannot currently determine the population nor the area of concentration of this class of respondents, the snowball sampling technique was adopted in which reaching out to the respective respondents was based on referral. The study was carried out within the Ajegunle-area of Lagos state and the majority of the fish farmers that constitutes the sample size are rear catfish. A total of 100 fishermen constituted the anticipated sample size for the study. The questionnaire was utilized in deriving data from the respondents, which was designed using a five-scale Likert format. Data distribution was done physically in order to aid the not-too-literate participants to interpret the questionnaire. The data collected were descriptively analyzed using charts, frequency, and percentages.

Data presentation and analysis and discussion

All 100 questionnaires distributed were retrieved and thus are used for this analysis. The data obtained are thus presented below:



Demographic data

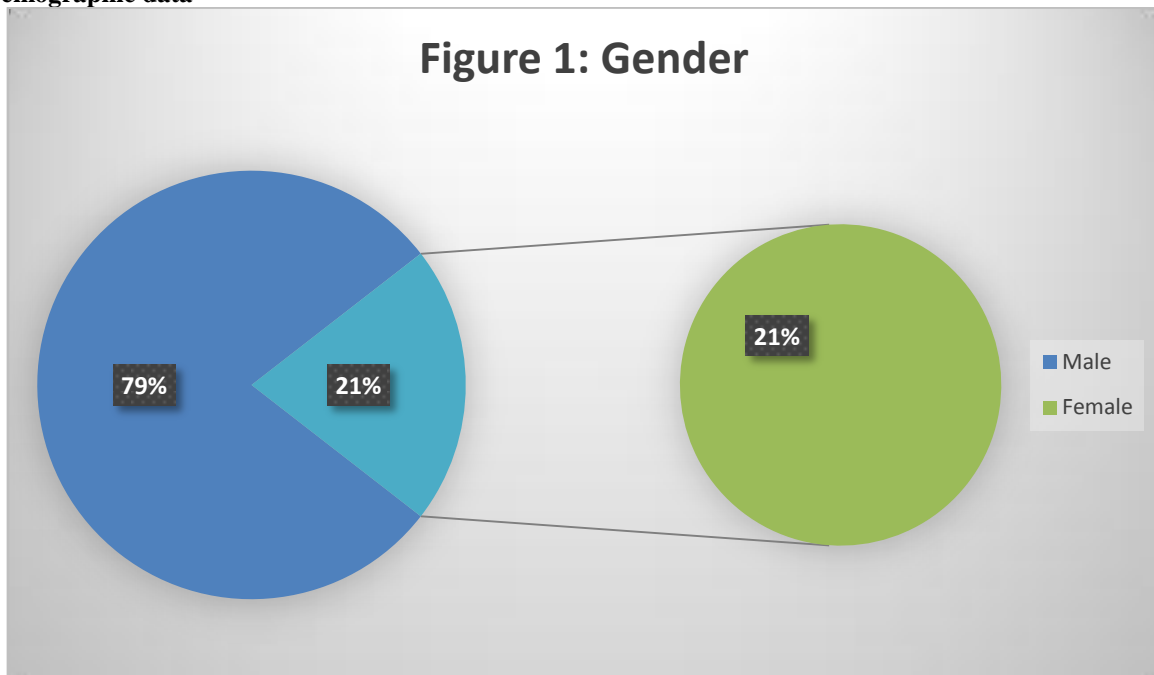


Figure 1 presented above indicates that both males and females engaged in fish farming with the majority being from the male gender (79%) while the remaining 21% were female. This indicates that fish farming is meant for both the male and female gender.

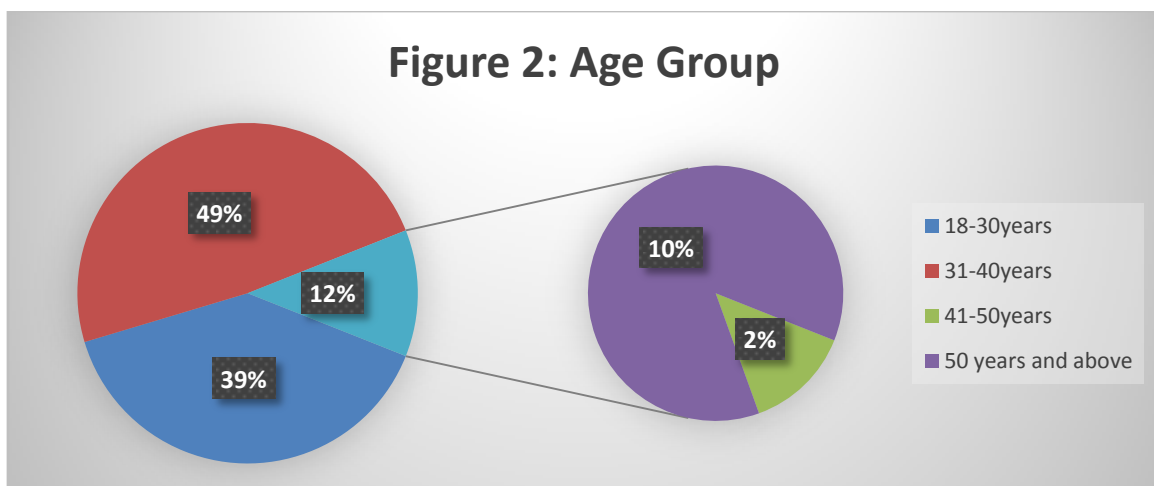
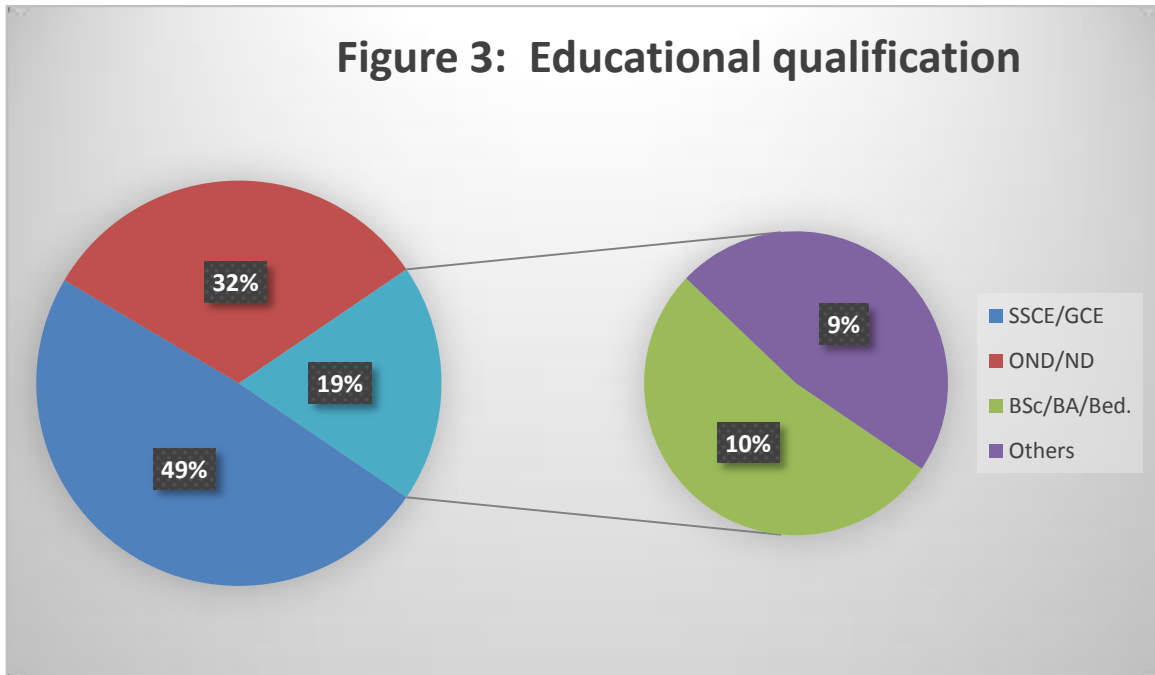


Figure 2 presents the age group of the participants in the study. The result revealed that those who are into fish farming are from different age groups. There are people within the ages of 18 and 30 years (39%); 49% made up the Age group between 31-40 years. Those within the ages 41-50 made up 2% of the population studied whereas those who are between the ages 50 and above constitutes 10% of the study population. This shows that both young and old can take part in fish-farming.

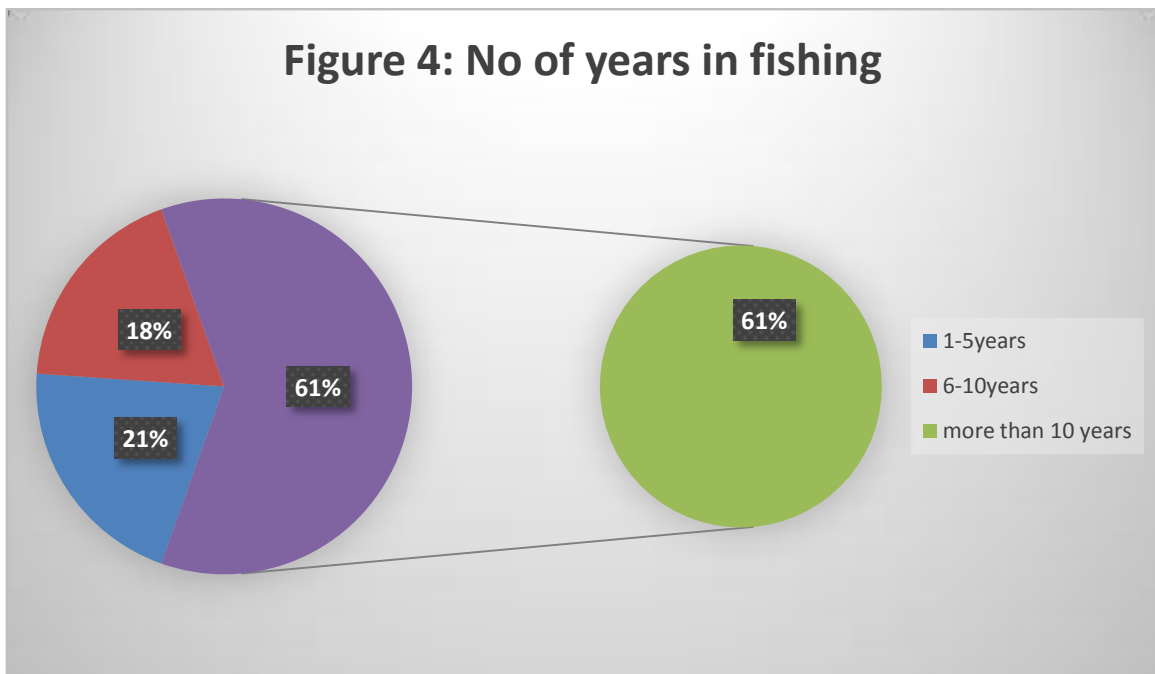


Figure 3: Educational qualification



According to figure 3 above, 49% of the fish farmers investigated had SSCE/GCE as their highest educational qualification. Similarly, 32% had OND/ND; 10% had BSc/BE/BA whereas the remaining 9% selected others.

Figure 4: No of years in fishing



The result presented in figure 4 above shows that the participants in the study have diverse years of working experiences ranging from between 1-5 years representing 21%. 18% represent those from 6 to 10 years whereas 61% selected more than 10 years. From the demographic data analysis, the study concluded that fish farming is not limited to gender, age, education, or experience but is open to anyone who is willing to take part in fish farming. This will go a long way in dealing with the challenges of unemployment.

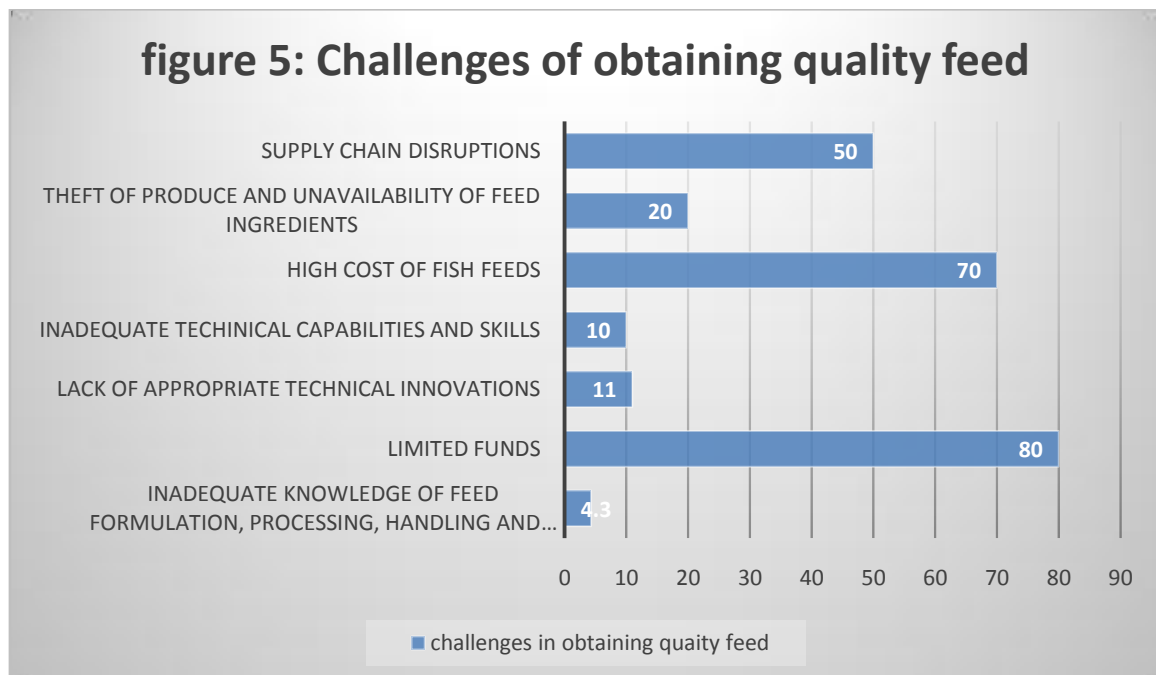


Answering of research questions

RQ1: What are the challenges of fish farmers in obtaining quality feeds?

The first research question was formulated to investigate the various challenges fish farmers faced when trying to obtain quality feed for their fish. In this case, the participants were allowed to select as many challenges as applied to them. Figure 5 below indicates that the most pressing challenge as reflected in the respondent’s opinion is a limited fund with over 80% of the participants selecting this option. This was followed by the high cost of fish feed with 70% agreement. This was followed by supply chain disruptions with 50% support. Theft of produce and unavailable feed ingredients were identified by 20% of the respondents. Lack of

appropriatetechnical innovations as well as inadequate capabilities and skills, both supported by only 10% of the respondents. Finally, inadequate knowledge of feed formulation, processing, handling, and storage came last with just 5% support. In summary, the entire challenge of obtaining qualified feed centers on inadequate finances, and once that problem is solved, every other problem presented in figure 5 will suffice. This finding is in agreement with Munguti et al (2021) whose study also identified challenges inadequate knowledge of feed formulation, processing, handling and storage, limited funds, and lack of appropriate technical innovations as preventing fish farmers from obtaining quality feed



RQ2: What is the impact of using quality feed on fish production?

Table 1: The impact of using quality feed on fish production

Statement	Strongly Agree/agree	Undecided	Disagree/strongly disagree	Total % in agreement
Using quality feed increase fish size and productivity	100	0	0	100.0
Using quality feed reduces feed costs	78	19	2	78.0
Using quality feed lowers mortality rate	98	0	2	98.0
Using quality feed increase incomes through faster growth	89	11	0	89.0



The second research question investigated the impact of using quality feed on fish production. The result of the study indicated that: Using quality feed increase fish size and productivity (100%); reduces feed costs (78%); lowers mortality rate (98%); and increases incomes through faster growth (89%). This result indicates that quality feeds is essential in enhancing fish production. The result of this study supports that of earlier researchers as Munguti et al (2021) whose study

revealed that the adoption of appropriate feed management technologies and feeding strategies is significant to maximizing productivity in the aquaculture sector. The effect of these challenges limits opportunities for investment which would have enhanced a viable and sustainable fish feed processing to satisfy demand of fish food.

RQ3: To what extent will the regulation of quality fish feed enhance aquaculture development?

Table 2: The extent to which the regulation of quality fish feed enhances aquaculture development

Statements	Strongly Agree/agree	Undecided	Disagree/st rongly disagree	Total % in agreement
Regulation of quality fish feed can boost aquaculture productivity	89	10	1	89.0
Regulation of quality fish feed reduce feed cost in aquaculture	99	1	0	99.0
Regulation of quality fish feed enhances the availability of raw materials in the right quantity to ensure the continuity of aquaculture operations	93	5	2	93.0
Regulation of quality fish feed will improve the quality of local food use in order to contribute to food security	91	7	2	91.0
Regulation of quality fish feed will enable small-scale aquaculture sector meets the objectives of sustainable development	88	10	2	88.0

Based on the result of this study, the following are impact of regulation of quality fish feed: it will boost aquaculture productivity (89%); reduce feed cost in aquaculture (99%); Regulation of quality fish feed enhances the availability of raw materials in the right quantity to ensure the continuity of aquaculture operations(93%); improve the quality of local food use in order to contribute to food security (91%); and enable small-scale aquaculture sector meets the objectives of sustainable development (88%). The result of this study confirms' the studies by Munguti et al (2021), Kong, *et al.* (2020) and Prabu, et al (2017)' sstudy who found the adoption of appropriate feed management technologies and feeding strategies as significant to maximizing productivity in the aquaculture sector.

IV. Conclusion and recommendations

Nutrition is an essential part of any animal production system if one wants to get a healthy, high-quality output out of it without breaking the bank. One of the most important components of successful aquaculture operations is high-quality

feed, and this need is only expected to grow. Although it's crucial that fish aren't overfed, it's just as crucial that they aren't underfed. Thus, producers should look for advice on the optimal daily feed quantity for their fish. The final feed quality is heavily dependent on the use of suitable processing technologies. Feed formulation entails choosing the wrong elements in the wrong quantities to create a homogenous mixture or pellets that can meet all the nutritional needs of the target fish for as little money as feasible. Ingredients are chosen, ground, and feed is formulated, mixed, pelleted, dried, packaged, and stored; these are the fundamental stages in the production of fish feed. Despite the existence of procedures and guidelines, they are often disregarded due to problems such as a lack of resources, the high price of fish feed, supply chain disruptions, theft of produce and the unavailability of feed ingredients, a lack of appropriate technological innovations, inadequate capabilities and skills, and a lack of knowledge of feed formulation, processing, handling, and storage. The findings of this research support the use of



controlled, high-quality feed as a technique of increasing output.

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REQUEST FOR

INFORMATION

Dear Respondent,
I am carrying out a study on “significance of regulated and quality feed on fish production”, and you have been chosen to be part of the study. This questionnaire is only for academic purposes. Kindly select the response which applies to you and all information will be kept confidential

SECTION A

- Please tick () where appropriate
2. Gender: Female () Male ()
 3. Age group: 18-30 () 31-40 () 41-50 () 50 and above ()
 4. Highest Educational Qualification: SSCE/GCE () OND/ND () B.SC. () Others ()
 5. Number of years as a fisherman: 1-5 (), 5-10 (), more than 10 years ()

SECTION B:

Instructions: Please tick (√) as appropriate where

Key: Strongly agree (4), Agree (3), Disagree (2), and strongly disagree (1).

SN	Item	SA	A	UD	D	SD
RQ1	What are the challenges of fish farmers in obtaining quality feeds?					
1	Inadequate knowledge of feed formulation, processing, handling and storage					
2	Limited funds					
3	Lack of appropriate technical innovations					
4	Inadequate technical capabilities and skills					
5	High cost of fish feeds					
6	Theft of produce and unavailability of feed ingredients					



7	Supply chain disruptions					
RQ2	What is the impact of using quality feed on fish production?					
8	Using quality feed increase fish size and productivity					
9	Using quality feed reduces feed costs					
10	Using quality feed lowers mortality rate					
11	Using quality feed increase incomes through faster growth					
RQ3	To what extent will the regulation of quality fish feed enhance aquaculture development?					
12	Regulation of quality fish feed can boost aquaculture productivity					
13	Regulation of quality fish feed reduce feed cost in aquaculture					
14	Regulation of quality fish feed enhances the availability of raw materials in the right quantity to ensure continuity of aquaculture operations					
15	Regulation of quality fish feed will improve the quality of local food use in order to contribute to food security					
16	Regulation of quality fish feed will enable small-scale aquaculture sector meet the objectives of sustainable development					