

## EFFECT OF MARKETING FUNCTIONS ON THE SALES OF CULTURED FISH IN BENUE STATE, NIGERIA

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**Abstract:** The increased need for protein in human diets, particularly in tropical developing regions, underscores the importance of fish as a key source of essential nutrients. This study analyzes the effect of marketing functions on the sales of cultured fish in Benue State, Nigeria. Primary data from 2023 were collected from fish producer–marketers using structured questionnaires and analyzed with descriptive statistics, multiple regression, and factor analysis. Results indicate that males aged around 39 years dominate the business, with most having tertiary education and cooperative membership. Key marketing functions include transportation, sorting, grading, and cash payments. These functions significantly enhance sales, with transportation and processing showing positive effects. Constraints such as price fluctuation, high transportation costs, and lack of capital were identified. The study concludes that adopting marketing functions improves profitability and recommends encouraging women participation, technology adoption, and government support for capital and extension services. This contributes to understanding marketing's role in aquaculture sustainability.

**Keywords:** Cultured fish, marketing functions, sales, Benue State, producer–marketers, constraints, aquaculture, profitability, socioeconomic characteristics, regression analysis

### 1. INTRODUCTION

The increased need for protein in human diet has its relevance in the need for improved health and the increase in human population globally. The need for protein is more critical in the tropical region wherein lie most of the developing countries [1]. Fish is a preferred protein source as it supplies essential nutrients which are lacking in other diets and its consumption is not forbidden within religious groups; unlike the eating of dog meat and pork which are forbidden in some religion such as Islam [2]. Fish plays an important role in human diet in towns and villages in Benue State by providing 77% of total animal protein intake [3], while it constitutes about 16% to world animal protein consumption [4]. Fish may be a preferred source of protein, but its sales has to do with the ability of the producer-marketer to meet the taste and satisfaction of consumers. This therefore requires that marketing efforts should be intensified to boost fish production, improve quality and make it available to buyers in the right place, time and price. Reports indicates that the fresh fish market in Benue State seem to be saturated with products; however, producers and marketers of cultured fish are inundated with unsold stock and have to device strategies to preserve harvested fish for future sales [3]. The marketing process plays a critical role in fish production and ultimately its sales, this is because it is only when the fish gets to the consumers that production is said to be complete. Marketing has been defined as all processes involved from the production of a commodity until it gets to the final consumer [1]. Marketing functions comprises set of activities that are performed in order to reach target markets with products that the manufacturer produces; these functions are chains of various activities involved in marketing. Fish and fish-related products are highly traded commodities; hence its production is a necessary part of the marketing function activity value chain. Marketing functions allow sellers the greatest opportunities to increase sales and achieve competitive advantages [5].

The value of marketing functions are paramount in the marketing of fish; this suggests that marketing functions can and should coexist with a market orientation and that the effectiveness of a market orientation depends on the presence of strong functions that are included in the sales and marketing of fish. The fish producer-marketer should be able to design a framework that defines the scope of relevant marketing functions and how these operate in a cross-functional, market-oriented fish marketing business. At the heart of this framework is the idea that marketing functions facilitate the link between the customer and various key processes within the fish marketing business. It is therefore essential for the fish producer-marketer to examine both the

value of marketing functions and their scope in a large-scale empirical effort to fish marketing. A functional marketing organization refers to the concentration of the responsibility for marketing activities (knowledge and skills) within a group of specialists in the organization. The benefits of functional structures are well documented and include enhanced efficiency and the ability to develop specialized and distinctive capabilities [6]. The risks include the challenge of coordination between specialized functions, inter-functional conflict, functional myopia, and overspecialization. It is important that fish producer-marketers adopt and incorporate marketing functions such as product branding, sales promotion, core competences and market positioning in order to operate profitably. For instance, product branding entails that a fish producer-marketer improves on the value of fish taken to the market by engaging in new production strategy, conduct market research and embracing product differentiation [1].

In order to improve sales, the fish producer-marketer needs to involve in sales promotion activities such as direct marketing, advertising and publicity. Core competencies are strategic functions embarked upon by the fish producer-marketer by introducing latest technology application, efficient and effective human resource management, hiring of competent and capable personnel, strategic management and robust application of financial and other resources. Market positioning for fish enterprise may include online marketing, market segmentation, effective communication, and distribution channels as well as target marketing. Marketing is seen as a system with definite functions, which can be classified into three, namely: physical, facilitating, and exchange functions; the three functions operate in synergy when interwoven, i.e., one gradually leads to another in series and then merges together [1]. Physical functions involve activities such as: transportation, handling and processing, sorting and grading. Facilitating functions consist of advertising, packaging, location display of goods, branding, handbills, and price differentiation. The exchange functions deals with physical payment of cash for goods, invoicing, payment for transportation and loading/offloading services.

These marketing functions are potentially capable of facilitating the sales of fish produced if they are properly internalized and performed in the fish business. Poor return on investment on cultured fish production and marketing is rampant and this situation is associated with several reasons, key among which are the knowledge and use of marketing functions by producer-marketers in their business operations [1]. Lack of appropriate marketing strategies, use of functions, and skills had further complicated the situation, leaving many fish producer-marketers struggling to grow their business.

The current situations in most fish farming enterprises are characterized by haphazard marketing strategies, lack of coherence, and focus. Interestingly, there is no concerted effort to initiate and sustain strategic marketing functions aimed at increasing the sales of cultured fish in Benue State. Available reports and empirical research have not sufficiently highlighted the set of functions that will suit and influence the sales of cultured fish. This dearth of knowledge and capacity has adversely affected the success and profitability of fish producer-marketers in the State. In addition to the absence of systematic and strategic marketing functions, fish farming development in Benue State is also faced by other challenges which include access to markets and market information, policy, legal and institutional framework, lack of access to water resources, poor human capacity, lack of empowered producer-marketer organizations, lack of business skills for stakeholders, quality and adequate seed availability to fill the fish supply gap for food security, general income level that will impact healthy living by citizens. There seems to be no research and studies carried out that focused on the significance of understanding and using marketing functions by fish producer-marketers, especially in Benue State, to improve their business operations and attract more profit. These are some of the reasons that necessitated the need to conduct this study in order to analyze and determine the effect of marketing functions on the sales of cultured fish in Benue State.

The main objective of the study was to analyze the effect of marketing functions on the sales of cultured fish in Benue State, Nigeria. H01: There is no significant relationship between marketing functions and sales of cultured fish in the study area:

- H02: Socioeconomic variables have no significant effect on the sales of cultured fish in the study area.
- H03 Socioeconomic variables have no significant effect on the choice of marketing functions used by cultured fish producer-marketers in the study area.

The specific objectives were to:

- Describe the socioeconomic characteristics of cultured fish producer-marketers in the study area.
- examine the marketing functions used by cultured fish producer-marketers in the study area;
- determine the extent of use of marketing functions by cultured fish producer-marketers in the study area;
- Examine the effect of marketing functions used by cultured fish producer-marketers on sales of cultured fish in the study area;
- identify and analyze the determinants of cultured fish sales in the study area;
- identify and analyze the determinants of marketing functions used by cultured fish producer-marketers and
- Identify the constraints encountered by cultured fish producer-marketers in the study area.

The study will be of benefit to the following stakeholders in fish production and marketing business: investors and managers of fish enterprises, Government and its relevant agencies, researchers as well as students. Investors and fish enterprise managers will find the study useful because it will help with the understanding of the various socioeconomic variables that need to be strengthened and directed at improving their businesses. It will also help them develop sustainable strategies around the various marketing functions and related activities to enable their businesses gain appreciable market share in the national and international business environment due to the competitive edge they will have over competitors. It will also serve as a guide to help them adopt and use appropriate strategic marketing functions that will ensure customer satisfaction, retention and loyalty.

The findings of the study will add to the existing body of knowledge that is necessary to assist the Government and its agencies, especially the Department of Fisheries in the Ministry of Agriculture to formulate policies aimed at enhancing the sales of farmed or domesticated fish as well as implementation of strategy in order to achieve the vision 2030 for sustainable growth and food security in the country. Generally, relevant agencies of government will find the study useful for data harvesting and policy formulation that are centered on the development of the aquaculture industry.

The study will also form a basis for students and other researchers to develop further studies. Scholars and researchers who would like to debate or carry out more study on fish marketing will find the study helpful and important in their research effort as they will find it as a ready source of literature to review. The study report will act as reference material and stimulate interest among academics and obviously this will encourage further research in this area. The study focused on the production and marketing of cultured fish; this involves growing fingerlings until they reach the maturity stage for sale; these fish producer-marketers cultivate, harvest and market fish produced in concrete, earthen, tarpaulin and fiber or plastic systems. The study was conducted in Benue State. Primary data of fish produced and sold in the year 2023 were obtained and assessed using relevant statistical tools to arrive at conclusions. The study highlighted and focused on the various activities that fall under the three marketing functions, namely, physical, facilitating and the exchange functions.

The determinants of fish sales used in the study area were: experience in fish production business, technology application, product value addition and market research and training, sales promotion through word of mouth, advertisements, and use of handbills, online marketing and communication, distribution, market standardization and customer preference.

- Cultured Fish: In this study, cultured fish refers to the fish that are produced by farmers from the fingerlings stage in enclosed environment and nurtured up to maturity ready for harvest and sold to buyers; this venture is also known as domesticated fish production.
- Marketing functions: Marketing functions as used in the study specialized activities performed in marketing. These are activities necessary to ensure that goods are moved from the place of origin (production) to the place of consumption. Thus, it is an act, operation or service performed in order to link the producer and the ultimate consumer.

These functions help the manufacturer in taking his products from the place of manufacture to the places where they are required for use or consumption. These functions are categorized into three namely; physical, facilitating and exchange.

Producer-marketer: This term refers to fish producers or enterprises who cultivate fish using various spaces and environments in their homes or some acquired or inherited lands (farms); after

cultivation, these producer-marketers sell the harvested fish to customers from the point of production (farm gate) or transport them to markets for sale. In some instances, they also engage in further processing of the fresh fish for the purpose of preservation; these processes include drying and smoking.

This section examines various existing publications and abstracts that are related to the study. Theoretical and conceptual frameworks, as well as empirical review of other studies in the field, were taken into account, and the summary of this literature highlighted. The study also hinges on the Expectancy confirmation theory developed by Richard L. Oliver in 1977. It is a cognitive theory which seeks to explain post-purchase or post-adoption satisfaction by consumers as a function of expectation and perceived performance, and disconfirmation of beliefs. Customer satisfaction is studied from different perspectives; these perspectives extend from the psychological to the physical, as well as from the normative perspective.

Research has been focused on two basic constructs:

- expectations prior to purchase or use of a product and
- customer perception of the performance of that product after using it.

A customer's expectations about a product bear on how the customer thinks the product will perform or satisfy a need. Consumers are thought to have various "types" of expectations when forming opinions about a product's anticipated performance. [7] described four types of expectations: ideal, expected, minimum tolerable, and desirable. [8] underlined different types of expectations, including ones about costs, the nature of the product, benefits, and social value. It is considered that customers judge products on a limited set of norms and attributes. [9] and [10] designed their researches as to manipulate actual product performance, and their aim was to find out how perceived performance ratings were influenced by expectations. These studies took out the discussions about explaining the differences between expectations and perceived performance. In some research studies, scholars have been able to establish that customer satisfaction has a strong emotional, i.e., affective component. Still others show that the cognitive and affective components of customer satisfaction reciprocally influence each other over time to determine overall satisfaction. Especially for durable goods that are consumed over time, there is value to taking a dynamic perspective on customer satisfaction. Within a dynamic perspective, customer satisfaction can evolve as customers repeatedly use a product or interact with a service. The satisfaction experienced with each interaction (transactional satisfaction) can influence the overall, cumulative satisfaction. Scholars showed that it is not just overall customer satisfaction, but also customer loyalty that evolves over time. The essence of this theory for the cultured fish producer-marketer is to ensure that customers' expectations in terms of quality of the product are satisfactorily met to ensure repeat purchase and loyalty. Richard L. Oliver propounded the disconfirmation theory in 1980 which is based on the comparison of customers' expectations and their perceived performance ratings. Specifically, an individual's expectations are confirmed when a product performs as expected. It is negatively confirmed when a product performs more poorly than expected. The disconfirmation is positive when a product performs over the expectations [11].

There are four constructs to describe the traditional disconfirmation paradigm mentioned as expectations, performance, disconfirmation and satisfaction. Satisfaction is considered as an outcome of purchase and use, resulting from the buyers' comparison of expected rewards and incurred costs of the purchase in relation to the anticipated consequences. In operation, satisfaction is somehow similar to attitude as it can be evaluated as the sum of satisfactions with some features of a product. Cognitive and affective models of satisfaction are also developed and considered as alternatives [12]. Fish producer-marketers are expected to note the importance that customers and consumers alike attach to quality (freshness, size, variant, availability etc.). These are some common expectations that customers look out for when they make purchases. Repeat purchase and loyalty are usually built around satisfaction gained from the first experience of a transaction. In order to operate profitably, fish producer-marketers must avoid actions that will lead to decrease in customer satisfaction.

This study is also anchored on the Vroom's (1964) Valence-Instrumentality-Expectancy (VIE) theory or expectancy theory. This explains the motivational process as a force determined by three factors that combine in a multiplicative way. The theory states that the intensity of a tendency to perform in a particular manner is dependent on the intensity of an expectation that the performance will be followed by a definite outcome and on the appeal of the outcome to the

individual. The Expectancy theory states that employee's motivation is an outcome of how much an individual wants a reward (Valence), the assessment that the likelihood that the effort will lead to expected performance (Expectancy) and the belief that the performance will lead to reward (Instrumentality). In short, Valence is the significance associated by an individual about the expected outcome. It is an expected and not the actual satisfaction that an employee expects to receive after achieving the goals. Expectancy is the faith that better efforts will result in better performance. Thus, the expectancy is the belief that one's effort will result in attainment of desired performance goals. Instrumentality is the belief that if one does meet performance expectations, he will receive a greater reward. Valence refers to the value the individual personally places on the rewards.

The VIE theory stipulates that causal relationships exist between motivational process and the levels of expended efforts, achieved performances and allocated awards. [13] were emphatic that individuals have different sets of goals and can be motivated if they believe that "Effort-performance" relationship is positive. The "Rewards-personal goals relationship" is also about the attractiveness or appeal of the potential reward to the individual in a transaction or relationship. The desire to satisfy the need is strong enough to make the effort worthwhile. The rationale behind the use of expectancy theory in this study is basically to evaluate the motivation for market participation by cultured fish producer-marketers. Since market participation is intended to bring about increase from production and additional income for the fish producer-marketer; it therefore follows that availability of enabling environment as could be provided by cooperative marketing society; fish producer-marketers would be motivated sufficiently to produce for the market.

Several models that have been developed about the hierarchy of effects for consumers and the most famous one, regrouping major elements from all the different models is the AIDA Model. The developer of the AIDA Model was St. Elmo Lewis in 1900. As per Strong (1925), AIDA is in fact an acronym for attention, interest, desire and action and describes a cognitive journey of a consumer that travels through four main stages and this model can be approached as a tool to encourage action by stimulating the purchase of a certain product or service. As such, it would be original to understand at which stage of this model could guerilla marketing impact more while promoting fresh organic agricultural products. It should however be pointed out that other controlled factors like label, price, layout/presentation, salesperson's approach and uncontrolled factors like colour of the product, climate (example winter or summer) and so on can alter the effects of guerilla marketing. It is necessary that the cultured fish producer-marketer understands how consumers undergo a psychological process to arrive at buying decisions. In order to arouse interest there is a need for strategic effort by the producer-marketer to draw the attention of prospective buyers to the product using various communication medium such as use of printed materials to showcase relevant information that will help the buyer in taking decision and acting accordingly.

The theory of demand and supply plays very vital role in the marketing of fish. The level of marketing activity going on in a market is determined primarily by the interplay of the forces of demand and supply. In a perfectly competitive market, where there are many consumers (buyers) and farmers (producers), the price mechanism is fully operational. In other words, the prices of goods and services are determined by the forces of demand and supply. Put differently, prices guide consumers in the choice of goods and services, and the quantities of such goods and services that they buy [14]. Demand is often times differentiated from effective demand. While demand refers to willingness to buy, effective demand entails willingness backed with the ability to pay. As such, demand is described as the quantities of goods and services that consumers are willing and able to buy at various prices. Demand is a function of several variables, i.e., the quantities of goods and services demanded at any given point in time is a function of several factors. Four of such factors are often pronounced. These are the price of the good (service), the price of substitutes and complements, income of consumers, and tastes or preferences [14].

The expression of "marketing mix" moved toward becoming advanced after Neil H. Borden published his 1964 article, 'The concept of the marketing mix'. Borden started utilizing the term in his commentaries in the late 1940's after James Culliton had depicted the advertising administrator as a "mixer of ingredients". The fixings in Borden's marketing mix included item product, price, place, promotion, individual offering, publicizing, packaging, bundling, show, adjusting, physical defect, and fact finding and examination. The 4Ps, in its modern form, was first proposed in 1960 by E. Jerome McCarthy who later assembled these fixings into the four classes that today are known as the price, product, promotion and place (4Ps) of marketing.

The objective is to settle on choices that focuses the four P's on the clients in the market so as to create a positive reaction. The marketing mix model and framework is especially helpful in the beginning of the advertising idea when physical items impacted to a bigger bit of the economy. These days, with marketing more coordinated into associations and with a more extensive assortment of items and markets, a few creators have endeavored to broaden its helpfulness by proposing another P, for example, process, people and packaging. Today, be that as it may, the marketing mix most usually stays in light of the 4Ps. In spite of its confinements and maybe in view of its straightforwardness, the utilization of this structure stays solid. Marketing mix used by a particular firm will contrast as shown by its assets, monetary circumstances and changing needs of customers.

The essence of a couple of parts inside the marketing mix will vary at any one point in time. A capable project mixes most of the marketing mix components for the items (4ps) into an organized program intended to accomplish the organization's marketing targets. 4Ps is a controllable arrangement plan since they are the strategic advertising instruments of product, price, place and promotion (4Ps) which turned into the components that promoting directors can control with a particular ultimate objective to best satisfy clients' wants and needs. From the perspective of marketing mix, four variables, namely price, product, place and promotion could predict business performance. [15] characterize a product as anything that can be offered to a business opportunity for consideration, procurement, or utilization that may fulfil a need and want. They additionally characterize a shopper item as the product purchased by the last customer for individual utilization. Buyers purchase product much of the time, with watchful arranging, and by looking at brands in view of value, quality and style. [16] likewise put it an alternate point of view as a physical appearance of the product, packaging, and tag. Information which can impact whether shoppers see a product in-store, analyse it, and buy it. Past researches obviously proposed that product significantly impacts business performance as clarified by [17, 18; and 19]. The product has a significant positive effect on business performance. [20] characterizes price as a cost of creating, conveying and advancing the product charged by the association. [21] is of the view that financial cost is one of the variables that impact shopper's impression of a product's esteem. Price can be expressed as the genuine or appraised estimation of an important item which is up for trade; different clarifications were additionally explained as the measure of cash paid for product. In different investigations of [22 and 23] they contended that there is a set critical connection between cost and business performance. The value that the organization sets for their product or administration plays a substantial part in its attractiveness. It is additionally illuminated by [24] as pricing for items or services that are more frequently available in the market is more flexible, implying that unit deals will go up or down more responsively in light of value changes.

The effect of valuing system on performance has been approved in earlier reviews as elucidated by [25] where exact outcomes affirmed the connection between pricing and organization performance, demonstrating a solid positive relationship between pricing technique and general performance. From [21] perspective, financial price is one of the segments that effects shopper's impression of an item's esteem. Price can be communicated as the genuine or assessed estimation of a profitable item which is up for exchange; some describe it as a measure of cash paid for the an item. Previous studies by [22; 23 and 26] assert that price is fundamentally associated with the business performance. The esteem association set for their product or services assumes an extensive part in its marketability. [15], characterize place or distribution as an arrangement of related associations included during the time spent making a product accessible for utilize or consumption by consumers.

## 2. MATERIAL AND METHODS

The study was conducted in Benue State, Nigeria, focusing on cultured fish producer-marketers. Primary data for 2023 were collected using structured questionnaires from a sample of fish producer-marketers. The sampling technique and size are not detailed in the provided document excerpt, but data were analyzed using descriptive statistics (frequencies, percentages, means), multiple regression analysis (for effects and determinants), and factor analysis (for constraints). Units were in Naira (₦) and kilograms (kg), following SI standards. Variables included socioeconomic characteristics (age, sex, education, etc.), marketing functions (physical, facilitating, exchange), sales volumes, and constraints. Regression models tested hypotheses, with lead equations selected based on  $R^2$ , F-values, and significance levels (\* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ ).

### 3. RESULTS AND DISCUSSION

Results of the study showed that more males whose age averaged thirty-Nine (39) years dominate the cultured fish business in the study area. The study also indicates that most of the respondents are married (61.9%) with sizable households (64.5%) and have attained education up to the tertiary level (75.3%). Most of the fish marketers are members of Cooperatives (64.2%) and have garnered years of experience in the business averaging Seven (7) years. The study also revealed that transportation, physical payment of cash for goods, payment for transportation services and sorting of fish rank high among the marketing functions adopted by fish marketers in the study area. The study identified a number of constraining factors militating against the progress of cultured fish marketers chief among which were: lack of stable electricity or power, low income of the population, price fluctuation, poor production systems, high cost of transportation and the activities of unions.

Factor analysis was used to identify factors that are constraining to cultured fish and sales in the study area. Kaiser’s rule of thumb of 0.4 was used as a minimum point that a variable will load before it can be accepted as having an effect on cultured fish acceptance. The study identified the activities of middlemen, production capacity, price fluctuation, fish processing and handling, high cost of transportation and lack or insufficient operational capital as some of the challenges that can influence on the acceptance and sales of cultured fish in the study area. These constraints are categorized into Six (6) factors as shown in Figure 1 below.

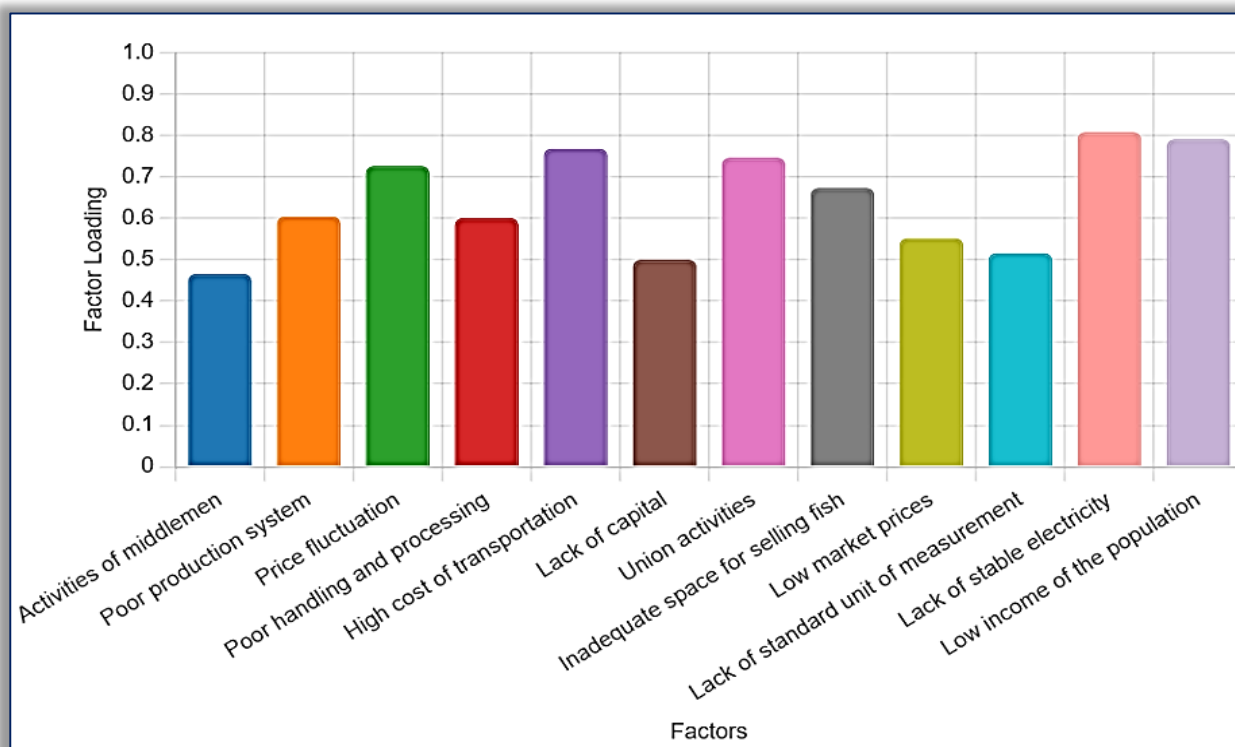


Figure 1: Constraint of cultured fish production and sales

Based on factors loading, the following middlemen related factors which are identified as constraints were extracted; activities of middlemen (0.465), union activities (0.746). Production factors have poor production system (0.604), inadequate space for selling fish (0.673), and lack of stable electricity (0.808). Under the price factor, three variables were identified as constraints and they are price fluctuation (0.726), low market prices (0.552) and low income of the population (0.790). Handling of products is another factor where we have poor handling and processing (0.600), lack of standard unit of measurement (0.516). Transportation has high cost of transportation (0.768) and finally we have under the capital factors, lack of capital required for operations.

These findings is in agreement with [27] who identified that some social constraints serve as militating constraints to profitable production and marketing of pond fish. [28] observed that cost of transportation is a huge challenge for fresh fish enterprises because failure to reach the markets with their commodities can result in large scale losses due to the perishable nature of these products. [29] reported that non-availability of adequate transportation (roads, vehicles, rails,

etc.) also hinder effective distribution of goods from one point to another. Another main constraint of fish marketing in the low income sector of the population is price. It should be noted that prices are likely to be high in areas close to large and growing urban markets with access to good transportation system. There is clearly a demand for fresh fish in both the urban and rural areas and all fish farmed is easily sold in rural areas. Rural producers think that the premium will be paid for fish in the urban or sub-urban markets but are faced with transport problems [30]. [31] noted that price fluctuation is a critical challenge that hampers the development of the cultured fish business. The impact of globalization has a negative influence on fish marketing and distribution in Nigeria; it has proven to be a disincentive to their operations due to the influx of cheaper priced imported fish into the country. The post-harvest, which primarily involves processing, storage and preservation is in the lowest ebb. It should be noted that fishery products are extremely fragile and the type of physicochemical techniques used in processing and conservation have a large part to play in targeting the market and the prices.

#### 4. CONCLUSIONS

From the study, it is evident that the adoption and use of relevant marketing functions by cultured fish producers-marketers add significant value in terms of acceptance and sales of the commodity. Functions such as transportation, processing, sorting and grading as well as payment for goods and transport services are common business practice of cultured fish producers-marketers in the study area; the adoption and use of these functions proved to be beneficial to the fish producer-marketers. Similarly, membership of cooperative and full-time participation in the business is important socioeconomic factors that influence the sales of cultured fish in the study area. With an average annual income of over 4million Naira, cultured fish production and marketing has proven to be a highly profitable business venture that has the potential to positively influence the economy of Benue State and Nigeria as a whole if fully supported and harnessed by stakeholders, especially governments. From the findings of the study, the following recommendations were made:

- More women should be encouraged to embrace cultured fish production and marketing; needless to emphasize the impact and contribution of women in household income and general wellbeing of the family.
- There is the need for cultured fish producer-marketers to embrace the use of improved technologies in their business, such as the use of ICT to aid ease of communication and contact with extension agents, adoption of innovative processing and preservation methods to minimize losses related to spoilage and significantly increase the shelf life of their harvested fish.
- Cultured fish producer-marketers need to also embrace the use of electronic banking in their transactions to avoid economic losses associated with holding of large sum of cash in today's reality of the prevalence of insecurity. Certainly, there is a significant improvement in the spread and quality of banking services across the country.
- Government should engage more with cultured fish producer-marketers through extension services to regularly educate and update them with information on modern and cost effective methods of operation as well as rearing of resistant or quality species of fish.
- Undoubtedly, investment capital is a major constraint for businesses in Nigeria, cultured fish producer-marketers are not exempted from the effect of the dearth of business capital. In order to support them, government should develop and implement policies that are mutually beneficial to all stakeholders to enable ease of access to capital to start and boost cultured fish production and marketing business.
- Transportation is an essential activity for fish producer-marketers; the recent hike in prices of petroleum products occasioned by the removal of subsidy by the government has had adverse effect on citizens and businesses.

Government, through relevant agencies can intervene in this critical sector to assist fish producer-marketers minimize cost of transportation of their goods in view of the rate of damage and loss they encounter.

vii. With improved production, cultured fish producer-marketers can be supported to adopt better marketing practice such as handling, sorting, grading, packaging and use of promotional activities that ensure they compete favorably in developed markets. Of all related literature reviewed during the study, less than 10% focused on the effect of marketing functions and their relationship to cultured fish sales. The evidently important relationship that exist between fish production and the use of marketing function by fish enterprises has not received in-depth, extensive or more

detailed studies especially as it concerns quality of fish produced and the marketing strategies adopted by participants in the market. Despite the constraint of cultured fish production and sales, use of marketing functions improved sales by over 30% for users of marketing functions in contrast to those who do not use the marketing functions in their operations.

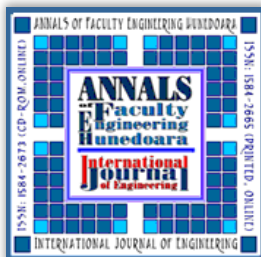
This study has made contribution in this area and possibly opened up research gaps that can be further explored. Further studies in this field can be tailored on the following topics;

- Assessment and evaluation of suitable marketing strategies for fresh fish acceptance and sales.
- A study to determine the level of awareness of the significance of marketing functions on cultured fish farming and marketing
- A study to determine the extent of adoption of technologies and innovation in the traditional approach to cultured fish cultivation and marketing.

#### References

- [1] Abbot and Luckham, J.P. (1980). *Agricultural Economics and marketing in the Tropics*. Longman Ltd.
- [2] Ade, O. E. (2014). *The supply and Demand for Loanable Funds Contemporary Economic Policy Issues*. Abuja: Central Bank of Nigeria. pp 37.
- [3] Adegoye, A. J. and Dittoh, J. S. (1985). *Essentials of Agricultural Economics*. Ibadan, Nigeria: Impact publishers Nigeria limited. pp. 63–67.
- [4] Adegoye, A. J. and Dittoh, J. S. (1985). *Essentials of Agricultural Economics*. Ibadan, Nigeria: University of Ibadan, University Press. p. 251
- [5] Adesina, A. A. and Djato, K. D. (1996). Relative efficiency of women as farm managers; Profit functions analysis in Cote d' Voire. *The Journal of the International Association of Agricultural Economics*, 5(3): 65–78
- [6] Agom, D.I., Etim, G.C. and Etuk, E.A. (2012). Analysis of Wholesale Frozen Fish Markets in Calabar, Cross River State, Nigeria. *Trends in Agricultural Economics*, 5(1): 61–69.
- [7] Agbelege, O. O. and Ipinjolu, J. K. (2003). An assessment of the management techniques of the fisheries resources in the Nigerian portion of Lake Chad. *J. Arid Zone fishery*, 1(1):89–98.
- [8] Akineeye, J.O Amoo, I. A, Arannilewa, S. T (2007). Effect of drying methods on the nutritional composition of three species of (Bonga sp. Sardinella sp. and *Heterotis niloticus*). *International Journal of Fish* 2(1):99–103.
- [9] Amoo, A. and Joia, A. (2007). Effect of Drying Methods on the Nutritional Composition of Three Species of (Bonga sp. Sardinella sp. and *Heterotis niloticus*). *International Journal of Fish*, 2(1):99–103.
- [10] Apata, O. M. (2012). Awareness and Adoption of fish production technologies in South Western Nigeria. *Journal of Emerging Trends in Engineering and Applied Sciences (JETEAS)*, 3(5): 819–822.
- [11] Ayanboye, A. O., Oluwafemi, Z. O. and Rafiu, R. A. (2015). Fresh fish (*Clarias gariepinus*) marketing system in major towns of Ibarapa zone, Oyo State, Nigeria. *International Journal of Applied Agricultural and Apicultural Research*, 11(1&2): 162–171.
- [12] Ayodele, I. A. and Fregene, B. T. (2003). *Essential of Investment in Fish Farming*. Hope publication Ibadan, Nigeria. p. 60.
- [13] Azeza, N. I. (1977). Fish handling, processing and marketing in Lake Chad Basin (Ed.). *Handling and marketing of Tropical fish products*. London: Tropical produce Institute. pp. 348–352.
- [14] Bassey, N. E., Ibok, O. W. and Akpaeti, A. J. (2013). Rice market Structure, Conduct and Performance in Nigeria: A Survey of Akwa Ibom State Rice Marketers. *Asian Journal of Agriculture and Food Science*, 1(3):102–111.
- [15] Benue State Ministry of Agriculture (2018). *Fish Farming in Benue State*. Department of Fisheries Bulletin, 27(2): 1–76.
- [16] Day, G. S. (1994). The Capabilities of Market–driven Organizations. *Journal of Marketing*, 58(4): 37–42.
- [17] Dibb, M. and Sally, P. H. (2006). *Marketing Planning*. (1st Ed.). Delma: Thompson Learning.
- [18] Doole, I., Grimes, T. and Demack, S. (2006). An exploration of the management practices and processes most closely associated with high levels of export capability in SMEs. *Marketing Intelligence & Planning*, 24(6): 632–647.
- [19] Edwards, S., Allen, A.J. and Shaik, S. (2005). Market Structure Conduct Performance (SCP) Hypothesis revisited using Stochastic Frontier Efficiency analysis. Selected paper for presentation at the American Agricultural Economics Association Annual Meeting, Long Beach, California, 2006. 4–5.
- [20] Eyo, A. A. (1998). An Appraisal of the Trading, Fish Handling and Processing in Kainji Lake Area NIFFR, New Bussa, Kwara State, Nigeria. 175–82.
- [21] FAO (1986). Freezing in fisheries FAO Technical Paper No. 167, 83 pp.
- [22] Falodun, O. M. (2011). Analysis of Marketing Channels and Efficiency of Marketing System for Smoked Fish Market in Ogun State, Nigeria. A Project Submitted to the Department of Aquaculture and Fisheries Management, College of Environmental Resources Management, University of Agriculture, Abeokuta, In Partial Fulfillment of the Requirements for the Degree of Aquaculture and Fisheries Management.
- [23] Flood, R. L. (2006). Entrepreneurship and Innovativeness. *Entrepreneur, Innovative Change*, 1(1):13–25.
- [24] FMARD (2016). *The Agriculture Promotion Policy (2016 – 2020), Building on the successes of the Agricultural Transformation Agenda (ATA), closing Key Gaps*. Policy and Strategy Document, Federal Ministry of Agriculture and Rural Development, Abuja FCT, Nigeria. 20–25.
- [25] Freedman, D.A. (2009). *Statistical Models: Theory and Practice*. UK: Cambridge University Press. p 26.
- [26] Gichangi, A. W. (2010). Analysis of Structure, Conduct and Performance of Sweet Potato Marketing: The Case of Nairobi and Kisumu, Kenya. M.Sc. Thesis Submitted to the Graduate School in Partial Fulfillment for the Requirements for the award of Master of Science Degree in Agricultural Economics of Egerton University. 58 pp.
- [27] Girei, A.A., Ndanitsa, M.A., Ogezi, E., Imam, M.I., (2021). Smoked and fresh fish marketing in Toto Local Government Area of Nasarawa State, Nigeria: a comparative analysis. *Acta Sci. Pol. Zootechnica*, 20(1), 15–26

- [28] Gordon, A. (2003). A Success Story in Fish Marketing. Manapad, Tamil Nadu In: D. King (Ed.). Fish Marketing: no shortcuts to success! Newsletter of the postharvest fisheries project, 1(12): 12–13.
- [29] Iliyasa, A. H., Onu, J. I., Midau, A. and Fintan, J. S. (2011). Economics of Smoked and Dried Fish Marketing in Yola North and South local Government Areas of Adamawa State, Nigeria. Journal of Agriculture and Social Science, 7(1): 13–16.
- [30] Ismail, A., Tijani, B. A., Abdullah, A. M. and Mohammed, B. (2014). Analysis of Marketing Channel and Market Structure of Dried Fish in Maiduguri Metropolis of Borno State, Nigeria. European Journal of Business and Management, 6(7): 147–155.
- [31] James, G. M., Witten, D., Hastie, T. and Tibshirani, M. (2013). An Introduction to Statistical Learning: with Applications in R. NY: Springer. 288 pp.



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