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Structure, Profitability, and Constraints of Catfish Marketing in Ibadan, Oyo State, Nigeria

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Abstract: This study investigated the marketing structure, profitability, and constraints associated with catfish distribution in Ibadan, Oyo State. The growing demand for fish protein in Nigeria has intensified the importance of effective marketing systems for aquaculture products, particularly catfish. However, some challenges continue to undermine profitability. A multistage sampling technique was used to select 150 catfish marketers across major markets, and data were collected using structured questionnaires. Descriptive statistics, gross margin analysis, and the Shepherd-Futrel marketing efficiency model were employed in analyzing the data. Results showed that marketers purchased catfish at an average of ₦1,096.25 per kilogram and generated a weekly profit of ₦705,095.35, with a marketing efficiency of 90.69%. Major cost components included the purchase price (90.88%) and transportation (4.15%). Despite high demand, particularly in the dry season, marketers faced significant challenges such as fish mortality during transport (72.5%) and lack of adequate preservation facilities. Fresh catfish was the preferred form for 97.5% of consumers, with size being the most critical factor in price determination. The study concludes that catfish marketing in Ibadan is economically viable, yet hindered by logistical and infrastructural challenges.

Keywords: mortality; preservation; efficiency; consumers

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1. Introduction

The marketing of food commodities in Nigeria is plagued by numerous structural and operational challenges. Among the most pressing issues are inadequate processing infrastructure, poor storage facilities, high rates of spoilage, inefficient preservation methods, substandard packaging, frequent price fluctuations, distribution bottlenecks, and unreliable transportation systems (Agbebi & Adetuwo, 2018). These constraints are particularly pronounced in the marketing of catfish a widely consumed aquatic product in Nigeria where they significantly reduce the efficiency and profitability of the supply chain. Consequently, many catfish farmers and marketers are compelled to sell their produce at reduced prices in order to avoid post-harvest losses and wastage. Beyond these logistical and technical challenges, catfish marketing in Nigeria, and particularly in Ibadan, is further complicated by contentious relationships between producers and marketers.

Farmers often allege exploitation by marketers, who are accused of purchasing catfish at artificially low prices while selling them to retailers and consumers at substantially higher margins. This concern is supported by Tomek and Robinson (1981), who observed that marketers frequently suppress farm-gate prices in an effort to maximize their own profits. Similarly, Animashaun et al. (2015) reported that marketers tend to obscure their sources of supply from secondary wholesalers and retailers, thereby controlling market access and inflating downstream prices. Retailers, in turn, are often forced to pay inflated prices due to their limited ability to procure catfish directly from farmers, leading to a broader call for more transparent and accessible price information within the marketing system. Agbebi and Adetuwo (2018) emphasize that the efficiency of the marketing system plays a pivotal role in the dissemination of price information among fish marketers. However, as catfish pass through multiple intermediaries before reaching the final consumer, prices tend to rise considerably. This price escalation reflects the cumulative costs incurred along the marketing chain. Oladimeji et al. (2013) identify these marketing costs as expenses related to transportation, handling, processing, packaging, promotion, distribution, and sales, in addition to statutory taxes, levies, and other charges.

Despite the many difficulties faced by catfish marketers, their role in the value chain remains indispensable. Ugwumba and Okoh (2010) outline three essential functions of catfish marketers: facilitating the movement of products from producers to consumers, enabling producers to understand and respond to consumer demands, and advising producers on optimal production timing and product types. These functions not only enhance market efficiency but also contribute to the development of more strategic and demand-driven aquaculture systems. Catfish marketing involves a variety of stakeholders including producers, wholesalers, retailers, and consumers, each operating with distinct interests and strategies aimed at profit maximization. Price variability is a notable feature of the value chain, influenced by product form, transportation, and intermediary involvement (Oladoja & Adeokun, 2013). These dynamics underscore the complexity of catfish marketing in Nigeria. Therefore, the objective of this study is to assess the profitability and identify the key challenges associated with catfish marketing in Ibadan, Oyo State, Nigeria. This research aims to provide insights that could inform more equitable, efficient, and sustainable marketing practices for the benefit of all actors in the catfish value chain.

2. Literature Review

An effective and resourceful marketing system is pivotal to ensuring the availability of fish for human consumption, national nutrition, and the economic wellbeing of stakeholders in the fisheries value chain (Adegeye & Dittoh, 1985). As such, the Nigerian economy requires an efficient marketing system to support the growth of the aquaculture sector. Fish marketing is a critical component of the fisheries sector, and efficient marketing structures directly affect fish availability, producer profitability, and consumer satisfaction (Olukosi & Isitor, 1990). The expansion of urban fish farming in Nigeria is increasingly shaping urban livelihoods by enhancing the socio-economic status of producers when managed under sustainable resource use (Ndu, 2006). Despite this growth, Nigeria's fish demand has continued to outpace local supply. According to Oladimeji (2017), Nigeria's self-sufficiency in fish production dropped drastically from 98.8% in 1983 to between 40% and 19.2% in subsequent years, indicating increasing reliance on fish imports. In 2018 alone, the country recorded a supply gap of 2.1 million metric tonnes, despite national production figures standing at approximately 1.1 million metric tonnes (ThisDay, 2018). This shortage has led to substantial foreign exchange loss due to fish importation, emphasizing the urgency of boosting local production and enhancing marketing mechanisms (Bachere, 1995).

Marketing efficiency defined as the cost-effective transfer of products from producers to consumers while satisfying consumer preferences—is key to bridging the supply-demand gap in fisheries (Olukosi and Isitor, 1990). The fish marketing system is multifaceted, involving several intermediaries such as wholesalers, retailers, processors, and transporters. As noted by Ali et al. (2008) and Lawal and Idega (2004), fish distribution does not occur directly between fishers and consumers; rather, the product passes through several layers, each adding cost, and in some cases, reducing quality due to poor handling and perishability. In the case of catfish (*Clarias gariepinus*), pricing is influenced by consumer preferences, size, distance, and the number of intermediaries involved (Adeokun, 2000). Urban markets often deal with smoked or fresh catfish depending on proximity to landing sites (Akogun, 1994). The dominance of middlemen in the marketing chain affects price uniformity and accessibility for low-income consumers. Additionally, challenges such as inadequate storage, poor road infrastructure, and high transportation costs hinder effective catfish marketing, especially in urban centers (Akanni, 2010; Oladoja & Adeokun, 2013). Salau et al. (2023) emphasize the role of marketing intermediaries facilitators, brokers, and retailers—in ensuring timely and cost-effective product delivery. However, catfish marketing in Nigeria is fraught with inefficiencies, particularly in the application of pricing strategies. Salau (2019) and Salau et al. (2023) observed that poor pricing models and limited marketing expertise undermine sales and profitability in the sector.

The need for a responsive and inclusive marketing strategy that considers quality, shelf life, affordability, and seasonal demand is therefore evident. Despite numerous studies on catfish production and marketing (Oladoja & Adeokun, 2013; Aasa et al., 2020; Kabir et al., 2021; Osundare & Adedeji, 2018; Salau et al., 2023), there remains a gap in understanding specific consumer–marketer dynamics, marketing costs and returns, and the critical factors influencing price variation in localized urban markets like Ibadan.

2.1. Problem Statement

Nigeria's catfish market plays a vital role in addressing protein needs and enhancing rural and urban livelihoods. However, the sector is burdened by inefficiencies in its marketing system, including fluctuating prices, inadequate storage, seasonal inconsistencies in demand, and the dominance of middlemen in distribution. Despite increasing urban demand and the growth of aquaculture, many marketers struggle with profitability due to high operational costs, poor marketing knowledge, and pricing challenges. Furthermore, limited empirical data exists on consumer preferences, pricing determinants, and the cost-return profiles of catfish marketers, especially in regional urban centers like Ibadan, Oyo State. Addressing this knowledge gap is crucial for formulating strategies to improve market efficiency, reduce post-harvest losses, and enhance the profitability and sustainability of catfish marketing in Nigeria.

3. Materials and Methods

3.1. Study Area

The study was conducted in Ibadan, the capital city of Oyo State, located in southwestern Nigeria. Geographically, Ibadan lies between latitudes 7° 23' and 7° 54' North of the equator and longitudes 3° 53' and 3° 54' East of the Greenwich Meridian. The city is a major hub for aquaculture activities, particularly catfish farming, and serves as a vital distribution point where catfish marketers supply fish to various parts of the country.

3.2. Study Population and Sampling Technique

The target population for this study consisted of catfish marketers and farmers actively engaged in the production and sale of catfish within Ibadan. A multistage random sampling technique was used to select the respondents. In the first stage, three local government areas (LGAs) Ibadan Southwest, Ido, and Ibadan Northeast were purposively selected from the eleven LGAs in the metropolis. These areas were chosen based on their high concentration of catfish production and marketing activities. In the second stage, a random sampling technique was applied to select respondents. A total of 50 catfish marketers were randomly selected from each of the three chosen LGAs, resulting in 150 respondents overall. Data were collected from major marketing locations within these LGAs, including Ikolaba, Dugbe Market, Aleshinloye Market, Omi Pandan, Eleyele Market, and Mokola Market.

3.3. Data Collection

Primary data were collected using a structured questionnaire designed to gather information on the respondents' socioeconomic characteristics, marketing practices, challenges faced in catfish marketing, and the preferences of their target customers. The questionnaire was pre-tested to ensure clarity and validity before full-scale administration.

3.4. Data Analysis

Data analysis employed both descriptive and inferential statistical methods:

- **Descriptive statistics** such as frequency, percentage, mean, and standard deviation were used to summarize the demographic and marketing characteristics of the respondents.
- **Inferential statistics** were applied to measure marketing efficiency and profitability using established economic models.

3.5. Marketing Efficiency

The Shephered-Futrel model was adopted to evaluate marketing efficiency. This model relates the total cost incurred by marketers to their total revenue and is expressed as follows:

$$ME = \frac{TC \ \ X\,100}{TR} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \ (1)$$

Where:

ME = Marketing Efficiency (%)

TC = Total Cost (sum of purchase and marketing costs)

TR = Total Revenue

Profitability Analysis

To assess the profitability of catfish marketing, the gross margin model was employed, as used by Ugwumba and Okoh (2010), Olaleye *et al*. (2019), and Hussayn and Gulak (2020). The formula is as follows:

$$GM = TR - TVC \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \ (2)$$

Where:

GM = Gross Margin

TR = Total Revenue

TVC = Total Variable Cost

Additionally, Return on Investment (ROI) was calculated to determine the efficiency of capital use in catfish marketing:

$$ROI = \frac{Net\ farm\ income}{Total\ Cost} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3)$$

These analytical tools provided a quantitative basis for evaluating the profitability and operational challenges encountered by catfish marketers in the study area.

4. Results and Discussion

4.1. Analysis of Costs and Returns in Catfish Marketing

Table 1 presents the cost structure and revenue performance associated with catfish marketing activities in Ibadan, Oyo State. The findings indicate that marketers purchase 1 kilogram of catfish at an average farm gate price of ₦1,096.25, with a typical weekly purchase volume of 5,697 kilograms. The marketing process incurs various operational expenses, including transportation, labor, rental for shop or storage space, and taxes or levies. The total marketing cost, which captures the cumulative expenditure from the point of purchase to the final consumer, is estimated at ₦6,871,914.65. The cost structure reveals that the purchase of catfish accounts for the largest proportion of the marketing cost, contributing 90.88% of the total. This observation is consistent with the report of Olaleye et al. (2019a), who similarly identified purchase cost as the dominant component in catfish marketing. Other expenses include: transportation: ₦285,411.87 (4.15%); mortality losses: ₦187,360.09 (2.73%); labor wages: ₦91,806.44 (1.34%); store rent: ₦50,000.00 (0.73%) and taxes and dues: ₦12,000.00 (0.18%). Despite these costs, the marketing enterprise proves to be profitable. The marketers recorded a total weekly revenue of ₦7,577,010.00 from the sale of 5,412.15 kg of catfish at a selling price of ₦1,400 per kg, resulting in a weekly profit of ₦705,095.35.

The marketing efficiency, calculated using the Shephered-Futrel model, stands at 90.69%, which aligns with the findings of Ugwumba and Okoh (2010), who reported a marketing efficiency of 90.39% among catfish marketers in Anambra State. According to Hussayn and Gulak (2020), a lower marketing efficiency percentage indicates better performance for marketers, as it signifies a smaller portion of revenue being consumed by marketing costs. Thus, a marketing efficiency of 90.69% implies that 9.31% of the total revenue remains as profit after accounting for marketing expenses. The Net Returns on Investment (NRI) is calculated at 1.10, signifying that for every ₦1.00 invested, the marketer earns an additional ₦0.10 profit per kilogram of catfish sold. This positive return illustrates the economic viability and profitability of catfish marketing in the study area, corroborating the earlier assertions of Babalola et al. (2015) and Olagunju (2019) regarding the potential of catfish trade as a sustainable agribusiness venture.

Table 1. Cost and Return Analysis of Catfish Marketing in Ibadan, Oyo State

Items	Variable cost (₦)	TC(%) of marketing cost
Fish purchase (₦ /Kg)	1,096.25	
Total quantity bought /week (Kg)	5,697	
Total cost of catfish purchased	6,245,336.25	90.88
Other expenses		
Transportation	285,411.87	4.15
Labours	91,806.44	1.34
Store rent	50,000	0.73
Tax / Dues	12,000	0.18
Mortality (3% of quantity bought)	187,360.09	2.73
Total cost of marketing	6,871,914.65	100
Revenue		
Fish (Selling price; ₦/Kg)	1,400	

Quantity sold (Kg)	5,412.15
Total revenue	7,577,010
Profit	705,095.35
Market efficiency (%)	90.69
NRI	1.10

4.2 Challenges in Catfish Marketing

Table 2 highlights the major challenges confronting catfish marketers in Ibadan, Oyo State. Among these, mortality during transportation emerged as the most significant, reported by 72.5% of respondents, followed by mortality at the point of sale (15%), and during harvest (12.5%). The high rate of mortality during transit is attributed to stress induced by long-distance travel, which compromises fish health and increases vulnerability to death. This aligns with the findings of Agbebi and Adetuwo (2018) and Hussayn and Gulak (2020), who noted that physical stress during handling and inadequate transportation conditions exacerbate fish losses in transit.

The mortality rate experienced by marketers varies, with 37.5% indicating losses between 0–5% and another 37.5% between 6–10%. However, 17.5% reported losses between 11–15%, while 7.5% experienced mortality rates exceeding 16%. Such high losses directly reduce profitability and marketing efficiency. This observation corroborates the findings of Oladoja and Adeokun (2013), who reported an inverse correlation between mortality rates and market performance, suggesting that reducing post-harvest losses is critical to improving economic outcomes in fish marketing. In a related study, Acharjee et al. (2023) emphasized the need for efficient fish distribution systems to ensure sustainability and economic viability in the aquaculture value chain. In terms of preservation techniques, the study found that 67.5% of marketers use palm oil to preserve live fish before sale, while 32.5% keep fish in bowls filled with water. This practice reflects the absence of modern preservation and storage facilities. A similar constraint was noted by Jabo et al. (2020), who identified inadequate storage infrastructure as a significant limitation for catfish marketers in Sokoto State. Regarding holding duration, 55% of respondents reported keeping fish for up to two days, 35% for three days, and 10% for more than three days before completing sales.

Transportation remains a critical barrier in the catfish supply chain, with 80% of marketers reporting associated challenges. To minimize fish stress, 77.5% of respondents indicated a preference for transporting fish early in the morning, citing better weather conditions and reduced handling stress as key reasons. Only 17.5% transport fish in the evening, while 2.5% do so during both periods. Price instability was also identified as a significant issue, with 60% of marketers reporting that catfish prices vary based on location. This aligns with the work of Olaleye et al. (2019b), who identified price fluctuation as a key constraint in the catfish trade. In a related study by Olaleye et al. (2019a), price volatility was ranked as the most critical issue affecting marketers in Kwara State, while transportation challenges were ranked third. According to the present study, 62.5% of respondents indicated that eastern states of Nigeria offer higher selling prices for catfish compared to Oyo State. Despite this opportunity, 85% of the respondents cited transportation as a major constraint to interstate fish marketing, with only 15% claiming no significant challenge. This corroborates the findings of Njoku and Offor (2016), who ranked high transportation costs as the second most pressing issue faced by catfish marketers in Nigeria.

Table 2. Challenges Faced by Catfish Marketers in Ibadan, Oyo State

Variables	Frequency	Percentage (%)
Mortality is high during:		
Harvest	15	12.5
Transportation	87	72.5
Marketing	18	15
At what percentage		
0-5	45	37.5
6 – 10	45	37.5
11 – 15	21	17.5
>16	9	7.5
Method of preservation before selling		
Oil palm	81	67.5
Keep in bowl with water	39	32.5
How long do you keep fish before selling		
More than 3 days	12	10
3 days	42	35
2 days	66	55
Experience transportation challenges		
Yes	96	80
No	24	20
Time for fish transportation		
Evening	21	17.5
Morning	96	80
Morning and evening	3	2.5
Why?		
Stress / handling	93	77.5
Weather conditions	27	22.5
Price varies with locations		
Yes	72	60
No	48	40
Which State buys fish with higher price		
Eastern States	75	62.5
Oyo State	45	37.5
Challenges of interstate fish selling/ marketing		
None	18	15
Transportation	102	85

4.3. Catfish Marketers–Consumer Relationship Dynamics

Table 3 presents insights into the marketing relationship between catfish sellers and their customers in Ibadan, Oyo State. A predominant share of consumers (97.5%) expressed a strong preference for fresh

catfish, while only 2.5% opted for smoked fish. Most marketers (60%) reported that their customer base is concentrated within Ibadan, while 40% serve clients across other parts of Oyo State. The major clientele includes hoteliers (50%), followed by restaurants (17.5%), individual buyers (12.5%), and other categories (20%). These findings emphasize the significance of institutional buyers in sustaining the local catfish market.

Daily demand was reported by 95% of marketers' customers, suggesting a high consumption rate and preference for regular supply. Notably, 90% of marketers indicated that they are consistently able to meet this demand. This reflects a relatively efficient supply chain in terms of production, storage, and delivery capacity. Seasonality also influences market behavior, with 87.5% of marketers observing that demand peaks during the dry season, possibly due to favorable weather conditions for fish handling and increased consumer activities during festive periods. Only 12.5% reported higher demand during the rainy season.

The price of catfish per kilogram ranged from ₦1,100 to ₦1,700, with an average of ₦1,280.00 ± 20.32. Regarding fish size, the market offers a broad range, from 200 g to 1,000 g, with an average size of 645.0 ± 36.15 g. These variations suggest that both price and size are carefully tailored to consumer needs and purchasing power. In terms of payment behavior, 80% of customers pay immediately upon delivery, while 20% are allowed delayed payments. This indicates a relatively high level of trust and liquidity in the fish marketing system. Regarding price determinants, the majority of marketers (82.5%) identified fish size as the primary factor influencing pricing. Other factors include distance to market (10%), competition (5%), and miscellaneous factors (2.5%). These findings affirm that consumers in Ibadan place significant value on fish size, which is a critical consideration for profitability and customer satisfaction in the catfish trade.

Table 3. Catfish Marketers–Consumers Relationship in Ibadan, Oyo State

Variables	Frequency	Percentage (%)	Mean ± SE
Form of fish sale			
Fresh	117	97.5	
Smoked	3	2.5	
Customers' locations			
Ibadan	72	60	
Oyo state	48	40	
Types of customers			
Hoteliers	60	50	
Restaurants	21	17.5	
Individuals	15	12.5	
Others	24	20	
How often do they demand for fish			
Daily	114	95	
Weekly	6	5	
Were you always able to meet with the demand			
No	12	10	
Yes	108	90	

When do you usually have high demand for fish			
Rainy season	15	12.5	
Dry season	105	87.5	
How much do you sell a kg of fish			
1100	3	2.5	1280.0±20.32
1200	66	55	
1300	30	25	
1500	18	15	
1700	3	2.5	
What size of fish customer demand (g)			
200	18	15	645.0±36.15
600	51	42.5	
800	39	32.5	
1000	12	10	
Prompt payment			
No	24	20	
Yes	96	80	
What factors contribute to price fixing			
Distance	12	10	
Fish size	99	82.5	
Competitors	6	5	
Others	3	2.5	

5. Conclusion

This study has provided a comprehensive assessment of the marketing challenges, preservation practices, consumer preferences, and market dynamics faced by catfish marketers in Ibadan, Oyo State. The findings reveal that mortality during transportation remains a critical constraint, significantly affecting profitability and market performance. Limited access to storage and preservation facilities, as well as high transportation costs, further compound the challenges faced by marketers. Price instability and seasonal fluctuations also influence market activities, with the dry season associated with higher demand and better market returns. Despite these challenges, catfish marketing in Ibadan exhibits considerable potential, supported by a consistent consumer preference for fresh fish, particularly among institutional buyers such as hoteliers and restaurants. Most marketers are able to meet daily demand, reflecting a relatively stable supply chain. Additionally, fish size emerged as the dominant factor influencing market prices, underscoring the importance of meeting consumer specifications in maintaining competitiveness. Addressing the identified constraints—especially improving transportation systems, storage infrastructure, and market accessibility—will be essential for enhancing the efficiency and profitability of catfish marketing in the region. These insights are crucial for policymakers, extension agents, and stakeholders in the aquaculture value chain who aim to strengthen fish marketing systems and promote sustainable livelihoods for fish marketers in Nigeria.

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