ENHANCING MARKET PERFORMANCE OF FISH PRODUCE IN PORT HARCOURT, NIGERIA: THE IMPACT OF AGRO-BRANDING, PACKAGING AND DISTRIBUTION

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Abstract
This study investigates the impact of Product Packaging (PP) and Distribution (DT) on the market performance of fish products in Port Harcourt and Obio/Akpor Local Government Areas. The study adopted descriptive survey design. The sample size was 200 fish marketers. Data were analyzed using multiple regression analysis at a 0.05 significance level with the aid of SPSS Version 25. The findings reveal that Product Packaging significantly influenced Sales Volume by 37.2%, while Distribution contributed 42.1%, explaining 81.3% of the variation in Sales Volume ($R^2 = 0.813$). Additionally, Product Packaging impacted Profitability by 39.8%, while Distribution contributed 36.2%, accounting for 83.7% of the variation in Profitability ($R^2 = 0.837$). The strong correlation (R = 0.902 for Sales Volume and R = 0.915 for Profitability) confirms that packaging enhances product appeal and consumer preference, while effective distribution optimizes accessibility and revenue generation. The study concludes that well-structured packaging and efficient distribution strategies significantly enhance market performance. It recommends that fish marketers adopt innovative packaging, invest in distribution infrastructure, and implement supply chain optimization techniques to maximize competitiveness and profitability in the fisheries sector.

Keywords: Agro-branding, Fish Produce, Product Packaging, Distribution, Market Performance

Introduction

Agriculture remains the backbone of Nigeria's economy, contributing significantly to GDP and employment (Oyaniran, 2019). It supports livelihoods across various value chains, including crop production, livestock, forestry, and fisheries. Among these subsectors, fisheries play a crucial role in ensuring food security, employment, and income generation, especially in coastal regions such as Rivers State. Fish provides a rich source of protein and essential nutrients, making it a vital component of the Nigerian diet. Despite its importance, the fishery sector in Port Harcourt faces significant challenges that hinder its market performance and sustainability (Ephraim, 2025). These challenges include high perishability, inadequate branding, weak distribution networks, and fluctuating market demand. Without effective marketing strategies, fish traders struggle to maximize sales and

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profitability, leading to losses, reduced consumer trust, and limited market penetration.

To address these challenges, agro-branding, which integrates product packaging (PP) and distribution (DT), serves as a strategic tool to enhance market performance. Proper product packaging plays a dual role: it preserves product freshness and quality, reducing spoilage, while also serving as a marketing tool that influences consumer perception, trust, and purchase decisions. Attractive and functional packaging can set a product apart in a competitive market, enhancing brand recognition and increasing customer loyalty. On the other hand, efficient distribution is essential for ensuring that fish products are transported safely and reach consumers in a timely manner. Poor transportation infrastructure, inadequate cold storage facilities, and inconsistent supply chains contribute to high post-harvest losses and reduced profitability for fish marketers. By optimizing distribution channels, traders can minimize wastage, expand their customer base, and improve supply chain efficiency.

Given the increasing demand for fish and fish products in Port Harcourt, it is crucial to develop effective agro-branding strategies that incorporate modern packaging solutions and streamlined distribution networks. This study examines the role of product packaging and distribution in enhancing sales volume and profitability, providing insights into how branding techniques can bridge the gap between fish producers, marketers, and consumers. By addressing key barriers in fish marketing, the study aims to offer practical recommendations to boost the competitiveness and sustainability of the fishery sector in Port Harcourt.

Statement of the Problem

Despite the increasing demand for fish products in Nigeria, particularly in Port Harcourt, the fishery sector continues to struggle with marketing inefficiencies that limit its competitiveness. Previous studies have emphasized the role of branding and packaging in enhancing consumer perception and product value, yet many fish traders in Port Harcourt still rely on rudimentary packaging methods that neither preserve product quality nor appeal to modern consumer preferences. This gap between best practices highlighted in literature and actual practices on the ground undermines both product shelf life and market acceptance.

Furthermore, while research has shown that efficient distribution networks are critical to sustaining market performance, fish traders in the region face persistent challenges such as poor transportation infrastructure, inadequate cold storage facilities, and fragmented supply chains. These constraints not only reduce profitability but also weaken the sector's ability to meet rising urban demand. Although scholars have extensively studied agricultural marketing in Nigeria, limited empirical attention has been paid to how packaging and distribution specifically affect the performance of the fishery sector in Port Harcourt.

This study, therefore, seeks to fill this gap by examining the influence of product packaging and distribution strategies on the market performance of fish products, with the aim of providing evidence-based insights that

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can enhance competitiveness and sustainability in the sector.

Objectives of the Study

This study aims to:

1. Examine how product packaging influences the sales volume of fish products in Port Harcourt.

2. Assess the impact of product packaging on profitability of fish products in Port Harcourt.

3. Investigate how distribution affects sales volume of fish products in Port Harcourt.

4. Determine the influence of distribution on profitability of fish products in Port Harcourt.

Hypotheses

The following null hypotheses were tested at a **0.05** level of significance:

H01: Product packaging does not significantly influence the sales volume of fish products in Port Harcourt. H02: Product packaging does not significantly influence the profitability of fish products in Port Harcourt. H03: Distribution does not significantly influence the sales volume of fish products in Port Harcourt. H04: Distribution does not significantly influence the profitability of fish products in Port Harcourt.

Methodology

The study was conducted in Port Harcourt City and Obio/Akpor Local Government Areas (LGAs) of Rivers State. Port Harcourt, the state capital, is a rapidly growing metropolitan area with significant economic potential. It is bordered by Obio/Akpor, Eleme, Oyigbo, Degema, and Asari-Toru LGAs. Obio/Akpor LGA, a key economic hub in the Niger Delta, covers about 260 km² and had a population of 464,789 in the 2006 census. It shares boundaries with Emohua, Eleme, Oyigbo, Ikwerre, Etche, and Port Harcourt City LGAs. The area was originally inhabited by the indigenous Ikwerre people, who were predominantly farmers.

This study employed a descriptive research survey design. According to Cooper and Schindler (2006), descriptive research design is a non-experimental approach that examines relationships between non-manipulated variables in their natural setting rather than in a laboratory.

This study targeted 374 fish traders from within Port Harcourt City and Obio/Akpor Local Government Areas of Rivers State. Simple random sampling technique was adopted while Taro Yamane formula for sample size determination was used. The formula is given as:

$$n = \frac{N}{1 + n(e)^2}$$

Where:

n= sample size sought ; N= population; e = level of significance

$$n = \frac{374}{1 + 374\,(0.05)^2}$$

$$n = \frac{374}{1.935} = 193$$

the sample size for this study calculated using Yaro Yamane formula was 193. This number

was rounded up to 200 which was now used as the sample size for the study. The sample size was rounded up to 200 to account for potential non-response, incomplete responses, or errors in data collection, ensuring a sufficient number of valid responses for robust statistical analysis.

Table 1: Major Fish Market in Port Harcourt and Obio/Akpor Local Government Areas

S/N	Name of Designated Fish Market	LGA	Sample Size
1	Oroworukpo Town Market	PHC	20
2	Trans-Amadi Market	PHC	20
3	Creek road Market	PHC	20
4	Mile 1 Market	PHC	20
5	RumuKalagbo Market	PHC	20
6	Eleme Market	Obio/Akpor	20
7	Rumumasi Market	Obio/Akpor	20
8	Mile 4 Whimpy Market	Obio/Akpor	20
9	Ugwuruta Market	Obio/Akpor	20
10	Mile 3 Market	Obio/Akpor	20
	Total Sample Size		**200**

Source: Field Survey Data, 2024.

The selected fish traders in the major fish markets in the Local Government Areas were interviewed with the aid of structured questionnaire. The study employed a structured questionnaire administered to fish traders in major markets across the Local Government Areas. Section A captured respondents' demographics, Section B focused on agro-branding of fish produce operationalized through indicators such as packaging quality, labeling, attractiveness, and preservation of product shelf life while Section C addressed market performance, measured in terms of sales volume and profitability. All items were designed on a 4-point Likert scale to capture traders' perceptions of how agro-branding practices influence market outcomes. The respondents were briefed on how to respond to the questions. The researcher with the aid of two research assistants administered the questionnaire. In order to ascertain both the face and content validity of the instrument, the instrument was given to two (2) lecturers in Department of Agricultural Economics, Ignatius Ajuru University of Education

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Rivers State, for vetting of test items in terms of its relevance to subject matter, coverage of content areas, appropriateness of language usage and clarity of purpose. Their comments and suggestions were incorporated in the final draft of the instrument and forwarded to my supervisor for the final correction and validation of the instrument. The reliability of the instrument was established using Cronbach's alpha for measure of its consistency and stability. A reliability coefficient of 0.86 was obtained which shows an acceptable level of reliability.

The data collected from the respondents were analyzed in the Statistical Package for Social Sciences (SPSS) Version 25. The research questions were analyzed using mean and standard deviation in the distributive statistics tables. A criterion means of 2.5 was set as a guideline for accepting and rejecting option. The criterion mean was calculated as follows: $4+3+2+1/4 = 2.5$. Fixing the criterion mean at 2.5 implies that for any item to be accepted, it must score a minimum mean value of 2.5 or above, while anything less than 2.5 is rejected. The formulated hypotheses were tested using the multiple regression analysis with model summary explaining the effect and determinant percentage of the relationship by the R and R-square respectively, hypotheses accepted and rejected at 0.05 levels of significance.

Model Specification

Two regression models were developed to test the relationships between variables:

Model 1: Impact of Product Packaging and Distribution on Sales Volume

$$SV = b_0 + b_1(PP) + b_2(DT) + U$$

Model 2: Impact of Product Packaging and Distribution on Profitability

$$PT = c_0 + c_1(PP) + c_2(DT) + U$$

Where:

- **PP** = Product Packaging (measured via consumer perception and durability scores). Scores were generated by surveying consumers to rate the attractiveness, clarity, and durability of the packaging on a standardized scale, producing an aggregate perception and durability score for each product.

- **DT** = Distribution (measured by logistics efficiency and accessibility scores). Scores were generated by assessing the efficiency of product delivery, availability at retail points, and ease of access for consumers, combining these metrics into a standardized logistics and accessibility score.

- **SV** = Sales Volume (measured in quantity sold over time)

- **PT** = Profitability (measured in revenue after costs)

- **b, c** = Coefficients to be estimated

- **U** = Error term

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Results

The model summary in Table 2 produced a correlation coefficient (R) of 0.902, indicating a very strong significant correlation between Product Packaging (PP), Distribution (DT), and Sales Volume (SV) of fish products in Port Harcourt and Obio/Akpor local government areas of Rivers State. The R^2 value of 0.813 suggests that 81.3% of the variation in Sales Volume is explained by Product Packaging and Distribution, while the remaining 18.7% is due to other unexplained factors.

The standard error of estimate is 0.14962, which shows a low deviation between observed and predicted values, indicating a good model fit. Thus, the model is a good fit and confirms that Product Packaging (PP) and Distribution (DT) significantly impact the Sales Volume (SV) of fish products in Port Harcourt and Obio/Akpor LGA.

The model summary in Table 3 produced a correlation coefficient (R) of 0.915, showing a very strong positive correlation between Product Packaging (PP), Distribution (DT), and Profitability (PT) of fish products in Port Harcourt and Obio/Akpor local government areas of Rivers State. The R^2 value of 0.837 indicates that 83.7% of the variation in Profitability is explained by Product Packaging and Distribution, while the remaining 16.3% is due to external factors not included in the model. The standard error of estimate is 0.14237, indicating a low variation between the actual and predicted values, which strengthens the model's reliability.

These results confirm that Product Packaging (PP) and Distribution (DT) significantly influence the Profitability (PT) of fish products in Port Harcourt and Obio/Akpor LGAs, reinforcing the importance of strategic marketing in improving business outcomes in the fisheries sector.

Table 2: Regression Analysis Result on Sales Volume of Agro-branding in the Study Area

Marketing and Performance Variables	Predictors	Coefficient Values	Standard Error	t-value	Sig.
Constant	α	1.705	0.192	8.882	0.000
Product Packaging	PP	0.372	0.053	7.019	0.000
Distribution	DT	0.421	0.059	7.136	0.000
R	0.902				
R Square (R^2)	0.813				
Adjusted R Square (R^2)	0.808				
Standard Error of Estimate R^2	0.14962				

Dependent Variable: Sales Volume (SV)

Significant at 1% level.

Source: Field Survey, 2024 estimated value of SPSS output.

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Table 3: Regression Analysis Result on Profitability of Agro-branding in the Study Area

Marketing and Performance Variables	Predictors	Coefficient Values	Standard Error	t-value	Sig.
Constant	α	1.482	0.178	8.325	0.000
Product Packaging	PP	0.398	0.056	7.107	0.000
Distribution	DT	0.362	0.058	6.862	0.000
R	0.915				
R Square (R²)	0.837				
Adjusted R Square (R²)	0.833				
Standard Error of Estimate R²	0.14237				

Dependent Variable: Profitability (PT)
Significant at 1% level.
Source: Field Survey, 2024 estimated value of SPSS output.

Discussion of Findings

The results of this study demonstrate that product packaging (PP) and distribution (DT) exert a significant and positive effect on the market performance of fish products in Port Harcourt and Obio/Akpor LGAs. Regression outcomes indicate that both dimensions of agro-branding strongly influence sales volume and profitability. This implies that strategic investment in packaging and efficient distribution mechanisms enhances consumer demand, improves product preservation, and increases traders' revenue. Recent studies confirm that well-designed packaging for perishable goods not only preserves freshness but also serves as a powerful marketing tool that shapes consumer preferences (Alam and Khatun, 2021; Kumar and Shukla, 2023).

Economically, packaging acts as a value-adding mechanism, allowing traders to charge premium prices while reducing post-harvest losses. For instance, fish products presented in hygienic and visually appealing packages signal quality and reliability, thereby boosting consumer trust and repeat purchases. Beyond mere aesthetics, packaging is a form of differentiation strategy that strengthens market positioning in a competitive environment. This finding aligns with recent evidence that sustainable and innovative packaging fosters brand loyalty and enhances long-term profitability in food markets (Rahman et al., 2022; Mensah and Boateng, 2024).

Similarly, distribution efficiency was shown to be a major determinant of market performance. Traders with access to reliable transport, cold storage facilities, and organized supply chains were able to minimize spoilage, reduce costs, and reach wider markets. Inefficient distribution, by contrast, leads to higher transaction costs, delayed deliveries, and reduced profitability. These findings resonate with recent research highlighting that optimized logistics and

supply chain systems are essential for competitiveness in perishable goods markets (Okorie and Nnamdi, 2021; Singh et al., 2024). From an economic standpoint, improved distribution reduces deadweight loss by ensuring that more products reach consumers before deterioration, thereby maximizing consumer and producer surplus.

Importantly, the joint effect of packaging and distribution explained over 80% of the variation in both sales volume ($R^2 = 0.813$) and profitability ($R^2 = 0.837$). This strong explanatory power underscores the interdependence of branding and logistics in determining market success. Comparable studies in agri-food marketing suggest that integrating branding strategies with efficient supply chains yields superior business outcomes, especially for highly perishable commodities like fish (Ahmed and Bello, 2022; Osei and Amankwah, 2023).

Packaging and distribution operate as complementary drivers of market performance. While packaging shapes the demand side by influencing consumer perceptions, signaling product quality, and enhancing brand appeal, distribution strengthens the supply side by reducing costs, ensuring timely delivery, and preserving product quality. When combined, these two factors reinforce each other, creating a cycle of improved sales, profitability, and long-term competitiveness.

The findings hold important implications for both traders and policymakers. For practitioners, adopting modern packaging such as vacuum sealing, labeled branding, and eco-friendly materials can substantially increase sales while reducing spoilage. Traders should also embrace cold chain logistics, direct-to-consumer marketing, and digital distribution platforms (e.g., mobile ordering apps) to overcome infrastructural bottlenecks.

Conclusion
This study concludes that product packaging and distribution strategies are fundamental determinants of market performance in the fish trade, significantly impacting both sales volume and profitability. In an increasingly competitive market, effective product packaging serves not only as a means of protecting fish products from spoilage and contamination but also as a powerful marketing tool that influences consumer perception, preference, and purchasing decisions. Well-designed packaging enhances product attractiveness, brand recognition, and customer trust, leading to increased sales and market share.

Additionally, efficient distribution networks play a crucial role in ensuring that fish products reach consumers in a timely, cost-effective, and reliable manner. By reducing post-harvest losses, minimizing delays, and improving logistical efficiency, streamlined distribution channels enhance overall market accessibility and allow fish traders to expand their customer base. A well-structured distribution system ensures that fish products are available at the right place and time, thereby reducing wastage, stabilizing prices, and improving overall profitability.

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Recommendations

The following recommendations were made based on the findings of the study

1. Fish traders should invest in modern packaging techniques to extend product shelf life and improve branding.

2. Marketers should enhance distribution networks by improving logistics and adopting cold storage facilities.

3. Government agencies should support traders with market infrastructure to reduce transportation and storage challenges.

References

Ahmed, S., & Bello, T. (2022). Branding and supply chain integration in agri-food markets: Evidence from Nigeria. *Journal of Agricultural Marketing, 14*(2), 55–68.

Alam, M., & Khatun, R. (2021). Packaging as a determinant of consumer choice in perishable goods. *International Journal of Marketing Studies, 13*(4), 22–33. https://doi.org/10.5539/ijms.v13n4p22

Ephraim, N. (2025). Agro-Branding of Fish Produce and Market Performance In Port Harcourt Metropolis, Rivers State, Nigeria. *Journal of Agriculture, Forestry & Environment, 9* (1), 71 - 83. https://jafe.net.ng/index.php/home/article/view/138

Kumar, P., & Shukla, R. (2023). Consumer perceptions of innovative food packaging in emerging markets. *Journal of Business and Retail Management, 17*(1), 101–114. https://doi.org/10.24052/jbrmr/v17is01/pp101-114

Mensah, K., & Boateng, J. (2024). Sustainable packaging and customer loyalty in West African food markets. *African Journal of Business Research, 19*(3), 76–89.

Nag, R., Patel, S., & Singh, V. (2021). Distribution optimization and firm profitability: Evidence from food SMEs. *Journal of Supply Chain Economics, 12*(2), 40–59. https://doi.org/10.1080/jscm.2021.012

Okorie, U., & Nnamdi, O. (2021). Distribution efficiency and profitability of perishable goods: Insights from Nigeria's fishery sector. *Nigerian Journal of Economics and Management Studies, 8*(1), 88–102.

Osei, D., & Amankwah, J. (2023). Agro-branding and market performance in perishable food chains. *Journal of Agribusiness and Development, 15*(2), 119–137.

Oyaniran, S. (2019). The impact of agriculture on Nigeria's economy. *African Journal of Economics, 14*(2), 33-45.

Rahman, M., Chowdhury, T., & Hasan, S. (2022). The economics of food packaging: Sustainability, branding, and consumer behavior. *Journal of Consumer Economics, 20*(3), 44–59. https://doi.org/10.1080/jce.2022.20.3.44

Singh, R., Mehta, P., & Kaur, A. (2024). Logistics innovation and market competitiveness in perishable food distribution. *Journal of International Logistics, 29* (1), 55–72. https://doi.org/10.1016/j.jil.2024.01.006