



## MARKET STRUCTURE AND PERFORMANCE OF FRESH FISH MARKETING IN SELECTED LOCAL GOVERNMENT AREAS OF NIGER STATE, NIGERIA

<sup>1</sup>Shuaibu, M. K., <sup>2</sup>Sallawu, H. and <sup>1</sup>Salah, A. O.

<sup>1</sup>Department of Agricultural Economics and Extension, Faculty of Agriculture, Nasarawa State University, Keffi, Nigeria

<sup>2</sup>Department of Agricultural Economics and Farm management, School of Agriculture and Agricultural Technology, Federal University of Technology Minna, Nigeria

Corresponding author's e-mail: [mohdshuaibu23@yahoo.com](mailto:mohdshuaibu23@yahoo.com) Phone: +2347037173299

### ABSTRACT

*The study was carried out to analyze market structure and performance of fresh fish marketing in Niger State. The study employed a multi-stage sampling technique where 120 marketers were selected in the study area. The results showed that 62% of the respondents preferred artisanal fish to the cultured fish while the Gini-coefficient was estimated to be 0.87 which is an indication of high level of concentration and consequently high inefficiency. The marketing margin analysis revealed a total marketing margin of 39%. It was further observed that the financing of fish marketing requires access to affordable credit facility to be able to acquire some infrastructural facilities. Also, high cost of transportation is a major constraint that contributed to the large percentage of fish price. It was therefore recommended that government should make credit facilities available at an affordable rate to the fresh fish marketers in the study area while the cooperative group device a means of providing transport facilities like cars and other means of transportation to their members thereby generating revenue for the cooperative.*

**Keywords:** Fresh fish, Marketing, Market Performance, Market Structure

### INTRODUCTION

The role of Agriculture as an important sector in the economic development of any nation including Nigeria cannot be over emphasized. Nigeria is a developing fishing nation, with a coastline of 853 km. The country has a strong fish culture, supported by natural catch fisheries throughout the year, with a total production of 960,000 metric tonnes (Federal Office of Statistics [FOS], 2008). Despite Nigeria's rich moderate tidal dynamics in her coast and the existence of high fishery potentials, notably within the up-welling zones of the continental shelf or the enrichment of the land based sources through the rivers, Nigeria fisheries have for a long time consisted of localized activities aimed at providing protein to her teeming population.

There exists a huge supply- demand gap for fishery products in Nigeria (Bowen and Jones, 2005). The high demand for fishery products arises from the awareness of its significance in the local diet and its favourable price compared to its substitutes. This gap has continued to widen, due to the absence or in adequate capital and marketing infrastructure as well as poor marketing system (Omolana, 2011). Niger State has over the years, experienced a sharp increasing demand for fresh fish leading to profitable

investment opportunities for fish farmers as well as fish marketers. Unfortunately, the potential gains of this venture could not be realized due to various constraints which could hinder efficient marketing system (Salihu, 2011). Animal protein sources such as beef, mutton and chicken are beyond the reach of an average income earner, which compels him/her to depend on fish which is the cheapest animal protein source (Samson, 1997).

Sustainable Aquaculture Digital (SAD, 2014) observed that some major importers reportedly had stockpiled imported fish in order to create artificial scarcity. Industry watchers had also indicated that Nigeria's fish quota has the propensity to increase food inflation and open up channels for over profiteering by politically-connected importers. However, the continued need to provide available fresh fish and its products to the populace of this region and to bridge the gap already created between demand and supply become imperative for this study to be undertaken. Based on the forgoing, this study is aimed at address two major questions, namely: (i) what are the consumer preferences for fresh fish in the study area? and, (ii) what is the structure and performance of fish markets in the study area?

## METHODOLOGY

### The Study Area

Niger State is located between Latitudes 8°22'N and 11°30'N and Longitudes 3°30'N and 7°20'E. The area is characterized by season that varies from wet to dry, the wet season last for a period of seven months (April – October) while the dry season cover the five months of (November – March). With an average temperature of 27°C and annual rainfall of about 1000 mm – 1500 mm (NIGIS, 2013). The State is bordered to the North by Zamfara State, to the North-West by Kebbi State, to the south by Kogi State, to South-West by Kwara State; while Kaduna State and Federal Capital Territory border the State to North-East and South-East respectively. Furthermore, the State shares a common international boundary with the Republic of Benin at Babanna in Borgu Local Government Area (LGA) of the state.

The State covers a total land area of 74,244 sq.km, or about 8% of Nigeria's total land area. This makes the State the largest in the Country. The State has a projected population of 5,556,200 in 2016 at an annual growth rate of 3.4 %. Agriculture is the back bone of the economy of the State. More than 80% of the population depends either directly or indirectly on it for their livelihood. By reason of its location, climate and soil, it is one of the States which has the most fertile agriculture lands in the country and has the capacity to produce most of Nigeria's staple

crops. It also has ample opportunities for grazing, fishing and forestry (Niger State Geographic Information System [NIGIS], 2013).

### Sampling Procedure and Sample Size

Multi-stage sampling technique was used for this study. Niger state is divided into three agricultural Zones, with each zone having a defined agricultural system. Zone II was purposively selected based on the prevalence of fresh fish marketing activities in the zone. The first stage involved the selection of 3 LGAs with the largest fresh fish markets in the zone. The second stage involved the selection of 4 fresh fish markets from the three LGAs. Two (2) markets were purposively selected being the biggest fish markets in Shiroro LGA, namely Zumba and Gwada fresh fish markets. One (1) fresh fish market was also purposively selected based on their popularity and dominance in Chanchaga LGA located at Keteren Gwari Mobil. Similarly, one (1) fresh fish market was selected from Suleja LGA being the only organized fresh fish market. The final stage was the selection of 10% of fish marketers in each location (from the sampling frame). The lists of all the fish marketers in each market were obtained from the market associations. A total sample of 120 fish marketers from whom relevant information were elicited was used for the analysis.

**Table 1: Number of fresh fish marketers in selected markets in the study area**

Markets	Sampling Frame	Sample Size (10 %)	Sampled Marketers
Zumba	220	22	20
Gwada	220	22	20
Mobil	450	45	40
Suleja	445	44	40
<b>Total</b>	<b>1,335</b>	<b>133</b>	<b>120</b>

Source: Field Survey, 2014

Gini coefficient was used to examine the market structure which is most prominently used as a measure of inequality. Mathematically, the Gini coefficient computation adopted from Iheanacho (2005) is expressed as follows:

$$GC = 1 - \sum XY \quad (1)$$

Where:

GC = Gini Coefficient, X = Proportion of Sellers,  
 Y = Cumulative Proportion of Sales,

∑ = Summation Sign, and 1 = constant or unity.

The GC varies from 0 to 1. If the coefficient is equal to 0, it implies perfect equality in the

distribution, if the value is 1, it corresponds to perfect inequality. The closeness of Gini coefficient to zero, suggest a greater degree of equality, with a lower level of concentration and more competition in the markets. Consequently, as the GC approaches unity, the degree of inequality increases. The higher the level of concentration, the more imperfect the markets are and the lower the efficiency of such markets (Ojo, 2014).

### Market Performance Analysis

Budget technique and marketing margin analysis

were used to analyze the performance of fish markets in the study area.

### Budget technique

Net Income (NI) model is one of the budgeting tools that were employed to measure the level of inputs committed into the enterprise vis-à-vis the output realized. The tool was used to ascertain the profitability of fresh fish marketing in the study area. When the gross income realized from the fresh fish sold is greater than the costs associated with the fish, profit is made, otherwise loss is made. NI is the difference between gross income and total costs of marketing. Net Income is specified as follows:

$$NI = GI - TVC - TFC \quad (2)$$

$$NI = \sum_{j=1} P_j Q_j - \sum_{k=1} P_k Q_k - TFC \quad (3)$$

$$TC = TFC + TVC \quad (4)$$

Where:

NI = Net Income,

GI = Gross Income,

$\Sigma$  = Summation sign,

$P_j$  = Selling Price of  $j^{\text{th}}$  output of fresh fish (₦/kg)

$Q_j$  = Quantity of  $j^{\text{th}}$  output of fresh fish (kg)

$P_k$  = cost Price of  $k^{\text{th}}$  input of fresh fish (₦/kg)

$Q_k$  = Quantity of  $k^{\text{th}}$  Input, of fresh fish (kg)

### Marketing margin analysis

It is also a measure of market performance. Marketing margin is the difference between the price paid by the consumers and that received by the producers (Ali, Gaya and Damfada, 2008).

This is expressed as follows:

$$\text{Marketing margin} = \frac{\text{sellingprice} - \text{purchaseprice}}{\text{sellingprice}} \times 100 \quad (5)$$

According to Olukosi *et al.* (2005) a larger variation between the marketing margins of participants indicates a wide price variation along the chain while a participant with higher marketing margin, is said to have a larger share of the marketing benefits.

## RESULTS AND DISCUSSION

### Consumer Preferences of Fresh Fish

The results of the analysis of consumers' preferences for fresh fish are presented in Table 2. The results showed that all (100%) the consumers preferred artisanal fish to cultured fish in Zumba market. This was due to the availability of the fish in the market, as well as the socio-cultural

activities in the study area. This study is in disagreement with the study of Omolanwa (2011) on the marketing structure of fresh fish at Olomore fresh water fish market in Abeokuta Ogun State where the overwhelming majority (77.1%) of the marketers purchased cultured fish. The results also showed that in Gwada market, however, the majority (90%) of consumers preferred artisanal fish (10%) to cultured fish. This choice by the larger proportion of the respondents could be attributed to the abundance of artisanal fish due to the nature of the area being surrounded by dams and rivers. This study is in line with the study of James (2012) whose results revealed that overwhelming majority (92%) of the consumers in zone B local government Area of Niger State preferred artisanal to cultured fish.

Furthermore, the results showed that 52.5% and 47.5% of the consumers preferred artisanal and cultured fish at Mobil market, respectively. The increasing number of the consumers' choice of cultured fish could be attributed to the activities as well as the socio-economic characteristics of the respondents in the study area. The market is located in the capital city where more economic activities take place, which may explain the large patronage of the cultured fish even though the artisanal fish had a higher demand. This study is in disagreement with the findings of Roy (2008) which showed that the demand for cultured fish (17,562 tonnes) was higher than artisanal fish (11,720 tonnes) in North region of West Bengal. The results further showed that the consumers in Suleja market preferred cultured (55%) to artisanal fish (37.5%). This could be as a result of the excessive demand of fresh fish in the study area which could be attributed to its nearness to the Federal Capital Territory. This study is in consonance with the findings of Salihu (2011) on the economic analysis of fresh fish marketing in Kontagora LGA of Niger State where he found out that the majority (58.8%) of the consumers' preferred cultured to artisanal fish.

### Reasons for Consumers Preferences

The respondents were asked to indicate the reasons for their preferences as indicated in Table 3. Their responses were captured and presented as follows: majority (57.5%) of the consumers' preferred artisanal fish to cultured fish due to its taste. The consumers believed that the artisanal fish had a better taste as compared to the cultured fish. The reason could be attributed to the different varieties

**Table 2: Frequency distribution of consumers' preferences of fresh fish across markets**

Fish type	Zumba	Gwada	Mobil	Suleja	Total %
Cultured fish	00(0)	02 (10)	19 (47.5)	22 (55)	43 (35.83)
Artisanal	20 (100)	18 (90)	21(52.5)	15 (37.5)	74 (61.67)
No response	00 (0)	00 (0)	00 (0)	03 (7.5)	03 (2.50)
<b>Total</b>	<b>20 (100)</b>	<b>20 (100)</b>	<b>40 (100)</b>	<b>40 (100)</b>	<b>120 (100)</b>

Source: Field Survey, 2014

Note: Figures in parentheses are percentages.

of feeds the artisanal fish had access to while the cultured fish on the other hand solely depended on the prepared fish concentrates. Moreover, not all fish species are cultured. A total of 35% of the respondents preferred cultured fish because of the freshness of the fish sold since the fish are in most instances brought live to the market for sale and

only in few instances where the fish is refrigerated. Furthermore, in some cases, the consumers resorted to 'point and kill' option at various fish joints which to the consumer confers more utility. If artisanal fish were not sold in a given market day, hardly can the fish be taken back to a water body. In the case of cultured fish however, unsold fish on a given market day are returned to the pond to be re-harvested at a later date.

**Table 3: Consumers' reasons for choice of fresh fish**

Reasons for Preference	Frequency	Percentage
Taste	69	57.50
Freshness	42	35.00
Meat quality	6	5.00
Medicinal benefit	2	1.70
Body size	1	0.80
<b>Total</b>	<b>120</b>	<b>100.00</b>

Source: Field survey, 2014

**Market structure of Fresh Fish Markets**

The computed Gini coefficient was 0.87 (Table 4). These results indicated a high level of concentration and consequently high inefficiency in the market of fresh fish in the study area. The implication is that the consumers will always suffer exploitation from the middlemen which

consequently will suppress consumers' motive for maximum utility. This finding was in line with the findings of Adeleke and Afolabi (2012) who found evidence of imperfection in competitiveness and high inefficiency in the market structure which might be as a result of dishonest practices in buying and selling activities in the study area.

**Table 4: Estimates of the Gini-coefficient for fresh fish markets**

Income from sales	number of sellers (frequency)	proportion of sellers (X)	Cumulative proportion of sellers	Total sales (N)	proportion of sales	cumulative proportion of sales (Y)	$\sum XY$
1-400000	89	0.742	0.742	114,511	0.022	0.022	0.016
400001-800000	11	0.092	0.834	612,690	0.117	0.139	0.013
800001-1200000	8	0.067	0.901	1,096,250	0.209	0.348	0.023
1200001-1600000	7	0.058	0.959	1,464,000	0.280	0.628	0.036
1600001-2000000	5	0.042	1.000	1,950,000	0.372	1.000	0.041
<b>Total</b>	<b>120</b>			<b>5,237,451</b>			<b>0.13</b>

Source: Field Survey, 2014

**Market performance of Fresh Fish markets**

The cost of purchasing fish product appeared to contribute the highest share of the total cost in the various markets. In Zumba market, for instance, as shown in Table 5, the cost of purchasing fish accounted for 76% of the total costs, while the least cost in that market was the fixed cost

accounting for only 2% of the total cost. A typical fish marketer realized the sum of ₦ 16,130 per month as the net income. The return per Naira invested was 1.22 which clearly showed that fish business in Zumba market was profitable. The low value of fixed inputs was evidence that the fixed inputs were negligible as the fishes were sold at the point of catch at the bank of river.

**Table 5: Costs and returns estimates of fresh fish marketing in Zumba market**

Variable	Amount (₦)/month	percentage
<b>Variable Cost</b>		
i. Cost of Storage	2,568.65	3.44
ii. Cost of Transport	6,972.05	9.33
iii. Marketing Tax	3,669.50	4.91
iv. Cost of fresh fish	56,803.86	76.03
v. Lost to deterioration	3,375.94	4.51
<b>(A) Total Variable Cost</b>	<b>73,390.00</b>	
<b>Fixed Cost</b>		
vi. Depreciation on fixed cost	1,325.00	1.77
<b>(B) Total Fixed Cost</b>	<b>1,325.00</b>	
<b>(C) Total Costs = (A + B)</b>	<b>74,715.00</b>	<b>100.00</b>
<b>(D) Gross Income</b>	<b>90,842.50</b>	
<b>(E) Net Income</b>	<b>16,127.50</b>	
<b>(F) Return per naira invested (TR/TC)</b>	<b>1.22</b>	

Source: Field Survey, 2014

The results in Table 6 showed that the cost of purchasing fresh fish in Gwada Market contributed the highest (74%) to the total cost of marketing. The depreciation on fixed cost accounted for only 2% being the least of all the cost items. A typical marketer realized a NI of about ₦740 per month with ₦ 1.01 return per Naira invested which was quite lower than that of Zamba fish market, all in Shiroro LGA. This finding is in agreement with the finding of Inuwa *et al* (2011), where they found out that the marketers NI was ₦3,378,855 per annum.

**Table 6: Costs and returns estimates of fresh fish marketing in Gwada market**

Variable	Amount (₦)/month	percentage
<b>Variable Cost</b>		
i. Cost of Storage	3,519.80	4.62
ii. Cost of Transport	5,092.52	6.69
iii. Marketing Tax	3,744.50	4.92
iv. Cost of fresh fish	56,541.95	74.28
v. Lost to deterioration	5,991.20	7.87
<b>(A) Total Variable Cost</b>	<b>74,890.00</b>	
<b>Fixed Cost</b>		
vi. Depreciation	1,235.00	1.62
<b>(B) Total Fixed Cost</b>	<b>1,235.00</b>	
<b>(C) Total Cost = (A + B)</b>	<b>76,124.97</b>	<b>100.00</b>
<b>(D) Gross Income</b>	<b>76,862.50</b>	
<b>(E) Net Income</b>	<b>737.50</b>	
<b>(F) Return per Naira Invested (TR/TC)</b>	<b>1.01</b>	

Source: Field Survey, 2014

Results in Table 7 further showed that the marketing tax contributed the least (about 1%) to the total costs in Mobil market. The cost of purchasing products however, accounted for 67% being the highest of all costs of marketing in the study area. A typical marketer realized a net income of ₦23,555 per month with ₦1.16 return per naira invested which is higher than that of Gwada market. The least amount paid for tax in Mobil fish market might be as a result of strong cooperative association in the market who were able to fight for their member's right, which eventually reduced the local charges to that level. The highest cost accounted for the purchase of fresh fish product in most of the markets could be attributed to high demand due to the limited supply of the product which eventually exerts pressure on the price of fish in the study area. This finding is in consonance with the study of Ojo (2014) who observed that the cost of purchasing



product accounted for the highest 83 % of the total costs of rice marketing in the study area.

Furthermore, the Suleja fish market results in Table 8 showed that the cost of purchasing product also accounted for about 59 % of the total cost of marketing, while the fixed cost contributed the least (about 5 %) to the total cost. A typical farmer realized a ₦I of ₦36,350 per month while the return per naira invested was ₦1.11. The return on investment in Suleja market was higher than that of Gwada fish market but lower than the Mobil fish market. This goes to show that fish marketers in Mobil market got higher returns in their fish business compared to their counterparts in Suleja fish market. The finding agreed with the finding of Obasi, Majeha and Okocha (2012) in

their study in Abia State Nigeria. The results from that study revealed that the market was highly profitable posing a monthly profit of ₦71,930. The results in Table 9 showed the costs and return of the overall market contributions where the marketing tax contributed the least cost of 4 %. The cost of purchasing fish product contributed 68.04 % of the total costs of marketing in the study area. A typical marketer realized a net income of ₦23,235.83 with ₦1.12 per naira invested. This is an indication that fish marketing in the study area is highly profitable as a typical marketer realized twelve kobo for every one naira invested. This study is in line with the finding of Adeyemo (2012) in the study carried out in Yanagoo, where the result showed a high profit with the net income of ₦214,370.70.

**Table 7: Costs and returns estimates of fresh fish marketing in Mobil market**

Variable	Amount (₦)/month	percentage
<b>Variable Costs</b>		
i. Cost of Storage	9,916.55	6.66
ii. Cost of Transport	28,333.00	19.02
iii. Marketing Tax	1,416.65	0.95
iv. Cost of fresh fish	99,165.50	66.58
v. Lost to deterioration	2,833.30	1.90
<b>(A) Total Variable Cost</b>	<b>141,665.00</b>	
<b>Fixed Costs</b>		
vi. Depreciation on Fixed cost	7,266.25	4.44
<b>(B) Total Fixed Costs = (A + B)</b>	<b>7,266.25</b>	
<b>(C) Total Costs</b>	<b>148,931.30</b>	<b>100.00</b>
<b>(D) Gross Income</b>	<b>172,486.25</b>	
<b>(E) Net Income</b>	<b>23,555.00</b>	
<b>(F) Return per Naira Invested (TR/TC)</b>	<b>1.16</b>	

Source: Field Survey, 2014

**Table 8: Costs and returns estimates of fresh fish marketing in Suleja market**

Variable	Amount (₦)/month	percentage
<b>Variable Cost</b>		
i. Cost of Storage	19,825.63	6.01
ii. Cost of Transport	71,120.50	21.57
iii. Marketing Tax	15,734.62	4.77
iv. Cost of fresh fish	192,906.50	58.50
v. Lost to deterioration	15,105.24	4.58
<b>(A) Total Variable Cost</b>	<b>314,692.50</b>	
<b>Fixed Cost</b>		
vi. Depreciation	15,056.25	4.57
<b>(B) Total Fixed Cost</b>	<b>15,056.25</b>	
<b>(C) Total Cost = (A+B)</b>	<b>329,748.75</b>	
<b>(D) Gross Income</b>	<b>366,097.50</b>	<b>100.00</b>
<b>(E) Net Income</b>	<b>36,348.70</b>	
<b>(F) Return per Naira Invested (TR/TC)</b>	<b>1.11</b>	

Source: Field Survey, 2014

**Table 9: Costs and returns estimates of fresh fish marketing (Pooled)**

Variable	Amount (₦)/month	percentage
<b>Variable Cost</b>		
i. Cost of Storage	9,723.20	5.15
ii. Cost of Transport	26,637.03	14.10
iii. Marketing Tax	7,235.86	3.83
iv. Cost of fresh fish	128,527.08	68.04
v. Lost to deterioration	8,773.48	4.64
<b>(A) Total Variable Cost</b>	<b>180,896.66</b>	
<b>Fixed Cost</b>		
Depreciation	7,992.50	4.23
<b>(B) Total Fixed Cost</b>	<b>7,992.50</b>	
<b>(C) Total Cost = (A+B)</b>	<b>188,889.20</b>	<b>100.00</b>
<b>(D) Gross Income</b>	<b>212,125.00</b>	
<b>(E) Net Income</b>	<b>23,235.83</b>	
<b>(F) Return per Naira Invested (TR/TC)</b>	<b>1.12</b>	

Source: Field Survey, 2014

**Marketing Margin of Fresh Fish Marketers**

The results showed the marketing margin of about 38 %, while the producers marketing share was about 63 % in Zumba Market (Table 10).

This means that for every hundred naira paid by the consumer, for the purchase of fresh fish in Zumba Market, the marketer gets ₦37 while the producer gets the share of ₦62. This finding is in

**Table 10: Marketing Margin of Fresh Fish marketers in the study area**

Markets	Zumba	Gwada	Mobil	Suleja	Pooled
Marketing margin %	37.47	26.44	42.51	47.31	39.41
Producer marketing share %	62.53	73.57	57.49	52.69	60.59
<b>Total contribution %</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

agreement with the finding of Ogunoma (2010) who on the evaluation of the distributive trade channels for selected food staples in Imo State, Nigeria. The study found that marketing margin of the marketer was about 34%.

In a similar vein, the marketing margin of marketers in Gwada Market is presented; the results showed that marketing margin of the marketers in the study area was 26 % while the producer marketing share was 74 %. This can easily be concluded that fish marketers in Gwada were making an appreciable profit. This finding is in line with the work of Obasiet *et al.* (2012), which revealed in their work a marketing margin of 28 % respectively. More so, in Mobil market for instance as shown in the results showed the marketing margin of 43 % while the producer marketing share was 58 %. The implication is that for every hundred Naira invested by fish marketers, a profit of more than ₦40 is made while the producer gets the remaining ₦60. This finding agreed with the finding of Salihu (2011) whose finding revealed a marketing margin of 38 % and the producer share of 63 %.

Furthermore, the results of marketing margin of marketers in Suleja. A typical marketer earns a marketing margin of 47 % with the producers marketing share of 53 %. This wider margin in Suleja market to other markets show that it is more profitable to market your product in Suleja market than any other market in the study area, that is for every hundred naira spent, in the marketing activities, the marketer gets forty-seven naira, while the producers' share was fifty-two Naira. This finding is in consonance with the study of Salihu (2011) who in his study Economic analysis of fresh fish marketing in kontagora revealed the marketing margin of 57 %.

Finally, the marketing margin of the whole market (pooled) was analyzed. The results showed that the marketing margin of the marketer in the study area was 39 % while the producer marketing share was 61 %. The implication is that, for every hundred naira spent, the marketer gets 39 Naira while the producers' gets sixty naira. This finding is in agreement with the finding of Ali *et al.* (2008) where they discover a marketing margin of 38 %.



## CONCLUSION AND RECOMMENDATIONS

This study revealed that majority of the respondents in the study area still has more preference in the artisanal fish to the cultured fish. The result of market structure in the study area showed a high level of concentration and inefficiency in the market. High cost of transportation is a major cost that contributed to the large percentage of the fish price. the cooperative group should device means of providing transportation facilities like cars and other means of transportation by also taking advantage of the public to generate revenue for the cooperative.

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