OPEN ACCESS JOURNALS
Indiana Journal of Agriculture and Life Sciences
Abbriviate Tittle- Ind J Agri Life Sci
ISSN *(Online)*- 2583-1623
Journal Homepage Link- https://indianapublications.com/journal/IJALS

INDIANA PUBLICATIONS
PRODUCTIVE AND QUALITY RESEARCH

Research Article

Volume-02|Issue-01|2022

Economics of Fish Marketing in Oyo State

Fapohunda, O.O.*[1], Adekunmi, A.O.1, Olaoye, O. F.[1], & Kolawole, O.F.[1]*

[1]Department of Fisheries and Aquaculture Management, Faculty of Agricultural Sciences, Ekiti State University, Ado Ekiti, Ekiti State, Nigeria

Article History
Received: 28.01.2022
Accepted: 20.02.2022
Published: 27.02.2022

Citation
Fapohunda, O. O., Adekunmi, A. O., Olaoye, O. F., & Kolawole, O. F. (2022). Economics of Fish Marketing in Oyo State. *Indiana Journal of Agriculture and Life Sciences*, *2*(1), 11-25.

Abstract: There is currently a wide gap between fish demand and supply in Nigeria arising from a continuous decline in domestic supplies and resulting in a growing reliance on massive importation of fish. However, efforts at ensuring sustainable fish production has not produced expected outcome because of the inefficient marketing system, thus slowing the performance or efficiency of the fishing industry. Hence, there is an urgent need to assess fish marketing system by analyzing the fish marketing structure, conduct and performance in Oyo State, Southwestern Nigeria. A multi-stage sampling procedure was employed to select respondents for the study. A sample size of 12 fish farmers/producers, 6 fish wholesalers and 22 fish retailers were proportionately and randomly selected from each of the Local Government Areas of the ADP zones (four zones) in the study area. Data obtained were analyzed using descriptive statistics, Gini-coefficient, Lorenz curve, gross margin, net margin analyses, marketing margin, marketing efficiency, operational efficiency, multiple regression and Likert rating scale. The market structure analysis revealed the Gini-coefficient of 0.3955 indicating a market that is close to a Perfect market in Oyo State. The market conduct results revealed that 45.0% of the fish marketers determined their selling price based on the marketing cost of fish and the profit desired. Also, greater proportion of the fish marketers (63.6%) use weighing scale as their unit of measurement. The market performance analysis revealed that fish marketing business in Oyo State is a lucrative one. Based on the findings, it is essential that fish marketers in Oyo State improve their market characteristics (market structure), behavior (market conduct) and also ensures a reduction in their marketing cost (market performance) to become a Perfect market by strictly pursuing policies and strategies that can lower the costs of marketing in order to increase the market efficiency.

Keywords: Fish marketing, conduct, performance, structure, perfect market.

INTRODUCTION

Fisheries development depends on improved production and processing technology and also on effective marketing system. About 40 million people are employed directly in the fishery sub-sectors of industrial, artisanal, fish farming, processing, preservation and marketing worldwide. According to the National Bureau of Statistics (2012), fisheries contribute about 3.24% of the Agriculture GDP. Its employment opportunities come from different fishing activities such as production, processing, preservation and transportation (Ali *et al.*, 2008).

Fish supply in Nigeria is either through capture fisheries, fish farming or by importation (Adewumi *et al.*, 2012), unfortunately, larger quantity of fish consumed in Nigeria is imported. To reverse this situation and improve fish production in the area, there is need for the development of perfect marketing performance which satisfies consumer demands with the minimum margin between producers and consumer prices. Hibbard (2017) confirmed that marketing is a series of activities involved in directing the flow of goods and services from producers to consumers. The need for the efficient marketing system of fish cannot be over emphasized. As important as marketing is, most of the studies on fish have concentrated on production (Dagtekin, 2009; & Zabbey, 2010), which was thought would solve the problem of high fish importation. Production and marketing constitute a continuum and the absence of development in one retards progress in the other. Also, there is limited information regarding fish marketing in Nigeria generally and particularly how specific aspects of the market (such as market concentration, market share, the nature of competition, and behavior of market participants) affect the performance of the market. This information gap can be addressed by analyzing the market structure; conduct and performance of fish marketing in Oyo State. Also, the factors influencing the income of fish marketers in the study area and the constraints of fish marketing system in the study area were examined.

Study Area

The study was conducted in Oyo State. Oyo State is a landlocked state with Ibadan which is the largest city in West Africa as its capital (Figure 1). It is located in the Southwest part of Nigeria and covers approximately an area of 35,743 square kilometers with a total population of 5,591585 (National Population Census, 2006). The state which lies between longitude 3°0'0" and 4°30'0" East of the Greenwich Meridian and latitude 7°0'00" and 9°0'0" North of the Equator is blessed with water resources which include Eleyele dam, Asejire, Erele, Ikose, Oge and Oyan reservoirs etc. Agriculture is the main occupation of the people of Oyo State. The state is divided into four Agricultural

***Corresponding Author:** Fapohunda, O.O.

Development Programme (ADP) zones and also consists of thirty-three (33) Local Government Areas.

Population of the Study

A total of 120 well structured-questionnaire was distributed to the sample population comprising of 12 (twelve) fish farmers/producers, 6 (six) fish wholesalers and 22 (twenty-two) fish retailers from 4 ADP zones (Saki Zone: Saki West, Ogbomoso: Ogbomoso North, Oyo: Oyo West and Ibadan: Ibadan North); although, 105 sets of questionnaire were retrieved for analysis.

Sampling Procedure and Sampling Size

A multi-stage sampling procedure employed was stratified based on the four (4) ecological Agricultural Development Programme zones in Oyo State. A sample size of 12 fish farmers/producers, 6 fish wholesalers and 22 fish retailers were proportionately and randomly selected from each of the local governments from the ADP zones (four zones) in the study area.

Data Collection

The primary data was collected through the aid of structured questionnaire and interview schedules from September, 2020 to June, 2021 marketing season while the secondary data was from bulletin, journals, conference papers, past projects, textbooks, articles, reports from ADP, and records of National Population Commission.

Data Analysis

Descriptive statistics such as frequency counts, charts and percentages were used to describe respondents' socio-economic characteristics. Gini coefficient and Lorenz curve were used to assess the market structure of the sample population. Gross margin and net margin analyses were also employed to determine the market profitability. Marketing margin was used to measure the difference in price of fish products as it moved from producers to consumers. Marketing efficiency and operational efficiency were employed to measure the efficiency of fish marketing system. Multiple regressions were used to determine the factors influencing the income of fish marketers and Likert Rating Scale was employed to analyse the constraints of fish marketing system in the study area.

Figure 1: Map of Oyo State showing the ADP Zones and Study Area

Analysis of Market Structure: **Gini Coefficient and Lorenz Curve**

Analysis of the market structure for an agricultural product (fish), determines whether the market is a perfectly competitive market (Gini coefficient less than 0.4), oligopolistic market (Gini coefficient higher than 0.4) or a monopolistic market (Gini coefficient is 1). The Gini coefficient is a measure of statistical dispersion, most prominently used as a measure of inequality of wealth or product distribution. It is defined as a ratio with values between 0 and 1 (Wikipedia, 2008). Mathematically, the Gini coefficient as used by Ojo (2014) is expressed as follows:

$G.C = 1 - \Sigma xy$

Where:

G.C = Gini Coefficient.

x = Percentage share of each class of seller.

y = Cumulative percentage of the sales.

Σ = Summation

The Lorenz curve, on the other hand, is used to represent income distribution by showing the proportion of income which goes to a particular percentage of the population. It relates the cumulative percentages of market shares to cumulative percentages of traders.

Analysis of Market Conduct

Market conduct refers to the patterns of behavior that firms follow in adapting or adjusting to the markets in which they sell or buy (Bain, 1968). This implies that the analysis of human behavioral patterns is not readily identifiable, obtainable, or quantifiable. Therefore conduct variables were treated in a descriptive manner which was measured quantitatively using frequency and percentages.

Analysis of Market Performance

To assess the performance of the market, the gross margin, marketing margin and marketing efficiency (including operational efficiency) were calculated.

Factors Affecting the Income of the Fish Marketers in the Study Area Using Multiple Regression (Ordinary Least Square Regression Technique):

The Ordinary Least Squares (OLS) regression technique was used to estimates the relationship between one or more independent variables and a dependent variable. The model is generally specified as follows:

$Y = f(X_i) + \mu$

where:

Y = Income of the fish sellers (₦)

F = functional form of the model

Xi = independent variables i.e. Age, Household size, Gender, Educational level, Ethnic group, Marketing experience, Interest rate, Product differentiation, Member of Association, Benefit derived from association, Purchase cost incurred.

***Corresponding Author:** Fapohunda, O.O.

μ = error term.

Constraints of Fish Marketing in the Study Area using Likert Rating Scale

The Likert rating scale was used to analyse the constraints of fish marketing in the study area. The use of 5-point likert scale was employed to determine the degree of seriousness of the marketing constraints with a score of five (5) indicating the strongly agreed and one (1) indicating not strongly disagreed. Information obtained from the likert scale were analysed using their means.

RESULTS AND DISCUSSION

Socio-Economic Characteristics of the Respondents are presented in Table 1. Analysis of gender distribution shows that 38.6% of the fish marketers are males while 61.4% of them are females. This implies that fish marketing in Oyo State is more of female business though there is absence of sex restriction. This agrees with Adeleke & Afolabi, (2012) that fish marketing was dominated by females. The mean age indicated that 34.3% of the respondents fell between the age group of 31 and 40years, 29.3% of the respondents were below the age of 31 years and 36.4% of the respondents fell above the age of 40 years. The result is similar to the findings of Oyinbo & Rekwot (2013); & Esiobu *et al.* (2014) that this age group constitutes the major productive work force and that young individuals have more potentials to withstand stress, strain and risk and have more strength to face tedious tasks associated with fish marketing than the younger or older individuals. More than half (57.1%) of the respondents had tertiary education. Thus, the higher level of educational attainment of the respondents might be an indication that people in the Southwestern, Nigeria are well educated which would positively influence the marketing activities as observed by Madugu and Edward (2011). The marital status shows that greater proportion (67.9%) of the fish marketers was married. This shows that fish marketing is dominated by married individuals who are responsible according to the societal standards; they therefore are likely to have some experience of life (Onubuogu *et al.*, 2014). 65.7% of the respondents had between 1 and 5 people in the household. The tendency towards small household size might be attributed to the high level of education of the respondents and their corresponding awareness of family planning measures which implies that more of labours involved in fish marketing were done by hiring workers or paying staff. The result revealed that most (65%) of the respondents were Christians, 33.6% were Muslims and 1.4% were traditional worshippers. The result implies that Fish marketing is accepted by all religions. The result shows that Yoruba (90.0%) dominate the fish marketing business in the study area and the high percentage signifies that these fish marketers will have a close relationship and also be able to interact well with their buyers during the course of transaction. More than half (50.7%) of the respondents had 1-5 years of fish marketing experience and the average years of fish marketing experience was 7 years. The result revealed that more than half of the respondents (58.6%) had fish marketing as primary occupation, this implies that fish marketing contributes substantial amount to fish marketers' income. The result further shows that most (46.4%) of the respondents had fish marketing as secondary occupation.

Table 1. Socio-Economic Characteristics of the Respondents

Variables	Frequency	Percentage (%)
Sex		
Male	54	38.6
Female	86	61.4
Age classification		
<21	5	3.6
21-30	36	25.7
31-40	48	34.3
41-50	23	16.4
51-60	27	19.3
>60	1	0.7
Educational status		
No formal Education	5	3.6
Primary Education	22	15.7
Secondary level	28	20.0
Tertiary level	80	57.1
Adult Education	5	3.6
Marital status		
Single	40	28.6
Married	95	67.9
Divorced	1	0.7
Widowed	4	2.8
Household size		
1-5	92	65.7

***Corresponding Author:** Fapohunda, O.O.

6-10	42	30.0
11-15	2	1.4
>15	4	2.9
Religion classification		
Christianity	91	65
Islam	47	33.6
Traditional	2	1.4
Ethnic group		
Yoruba	126	90.0
Igbo	5	3.6
Hausa	7	5.0
Others (Ebira)	2	1.4
Marketing experience		
1-5	71	50.7
6-10	49	35.0
11-15	9	6.4
16-20	9	6.4
>20	2	1.4
Primary occupation		
Fish Production and Marketing	82	58.6
Artisan	16	11.4
Civil Service	9	6.4
Crop Production	1	0.7
Animal Production (ruminants and non-ruminants animal)	16	11.4
Business/Trading	16	11.4
Secondary occupation		
Fish Production and Marketing	65	46.4
Artisan	3	2.1
Crop Production	2	1.4
Animal Production (ruminants and non-ruminants animal)	14	10.0
Business/Trading	45	32.1
No Secondary occupation	11	7.9

Source: Field survey, 2021

Technical Factors of the Respondents are presented in Table 2. Marketers' source of fish shows that greater proportion (71.4%) of the respondents obtained their stock within the study area while the remaining fish marketers (29.6%) bought outside the study area (Lagos, Ibadan, Ilesha, Igbokoda). This result implies that fish marketers who obtained their fish product within the state enjoy some privileges like: less cost on transportation, reduced perishability, curtailed road mishap and prevention of all sundry expenses. More than half (56.4%) of the respondents revealed that the interest on loan (Principal) is high which can mitigate the expansion of their fish business. Also, the data presented by respondents show that the major sources of fund for financing marketing activities were from their personal savings (46.4%). This agrees with Nsikan *et al.* (2015); & Nwabunike (2015) that in terms of funding, most of the fish marketers in the study area financed their business with their personal savings. It is therefore evident from the result that personal savings is the most reliable and ready source of funds for fish marketers in the study area and most of them getting funds from such source might be because they were unable to cope with high level of interest rates charged by most commercial banks, inability to present an acceptable collateral security required to obtain loan from banks as reported by Mafimisebi *et al.* (2010). Also, in the study area, 61.4% of the respondents revealed that they use the particular source of fund because it is the only available source. This could cause a setback in the marketing business because opportunities to fund their business are limited. Furthermore, 62.1% of the respondents revealed that they used funds that have no interest. The result implies that the most of the fish marketers had 0% as their interest rates; this means that most of the fish marketers finance their business with funds that does not involve interest rates; in other word most of the marketers do not use Loan as their source of fund. They only made use of personal savings, grants, donor agencies and money from family and friends. Table 2

***Corresponding Author:** Fapohunda, O.O.

showed that most of the fish marketers (42.9%) do not carry out the marketing activities by themselves alone; they pay staff or hired labour to carry out their marketing functions. This might occur due to the small family size of marketers in the study area and which invariably increased the cost of fish marketing. The result shows that half (50.0%) of the respondents sell their fish at the market, 24.8% sell their fish at the pond and 22.8% sell their fish both at the market and pond. The table reveals that majority of the respondents (79.3%) operates on a daily basis. It denotes that the fish markets in the study area are very active as the functions of the markets satisfy both the marketers and the consumers daily. Also, the cultured fish (catfish and tilapia) which are seasonally harvested every 6 months (15.0% of the respondents) were also made available on a daily basis through the smoking process. This finding conforms to Nwaru *et al.* (2011) who stated that an efficient marketing system ensures that goods which are seasonal will be available all year round, with little variation in prices, which can be attributed to cost of marketing functions like storage, processing, transportation, etc.

Table 2. Technical Characteristics of the Respondents

Variables	Frequency	Percentages (%)
Marketers' source of fish		
Ponds in Oyo State	41	29.3
Cold-rooms in Lagos	40	28.6
Cold-rooms in Oyo State	59	42.1
Problems encountered when sourcing for fund		
No place to borrow	22	15.7
No collateral	23	16.4
Interest is too high	79	56.4
Repayment period is too short	16	11.4
Source of funds for financing marketing activities		
Personal savings	65	46.4
Cooperative society	30	21.4
Thrift	5	3.6
Commercial bank	7	5.0
Agric. bank	12	8.6
Donor agencies	1	0.7
Family and friends	15	10.7
Grant	1	0.7
Personal effort & cooperative society	4	2.9
Reasons respondents rely on these sources of fund		
It is easy to get	41	29.2
It has low interest	13	9.3
Is the only available source	86	61.4
Rates of interest of funds of respondents		
0%	87	62.1
1-3%	22	15.7
4-6%	13	9.3
7-10%	7	5
>10%	11	7.9
Type of labour used for marketing		
Self	50	35.7
Self	60	42.9
Self and hired	10	7.1
Self and family	15	10.7
Self, hired and family	5	3.6
Location where respondents market fish		
Market	70	50.0
Pond	47	33.6
Both	23	16.4
Number of times the markets open		
Daily	111	79.3
Weekly	8	5.7
Monthly	0	0

***Corresponding Author:** Fapohunda, O.O.

Occasionally	21	15.0

Source: Field survey, 2021

Structure of Respondents' Fish Market is as presented in Table 3. The Gini-coefficient of 0.3955 was gotten from the revenue realized by respondents in the study area. It implied efficiency in the income distribution and structure of the marketers. This posited that the market constitutes marketers with nearly equal income, equal share of the market and fairness of profit shares in the industry. It is also an indication that rich investors among fish marketers did not have power over the gross income that is, the high-income marketer may not likely earn much more than the lowest-income marketer (Ojo *et al.*, 2016). This type of market denotes almost a Perfect market (less than 0.4).

Table 3: Estimate of Gini Coefficient of Fish Marketers in Oyo State

Range of income	Frequency of sellers	Proportion of sellers (Z)	Cumulative proportion of sellers	Total sales (#)	Proportion of total sales	Cumulative proportion of total sales (Q)	ZQ
<5 m	137	0.98	0.98	65,399,000	0.60	0.60	0.588
5-10 m	1	0.01	0.99	5,040,000	0.05	0.65	0.0065
10-15 m	0	0	0.99	0	0	0.65	0
15-20 m	2	0.01	1.00	38,400,000	0.35	1.00	0.01
20-25m	0	0	1.00	0	0	1.00	0
25-30m	0	0	1.00	0	0	1.00	0
30-35 m	0	0	1.00	0	0	1.00	0
35-40 m	0	0	1.00	0	0	1.00	0
40-45 m	0	0	1.00	0	0	1.00	0
45-50 m	0	0	1.00	0	0	1.00	0
50-55 m	0	0	1.00	0	0	1.00	0
55-60 m	0	0	1.00	0	0	1.00	0
60-65 m	0	0	1.00	0	0	1.00	0
TOTAL	**140**	**1.00**		**108,839,000**	**1.00**		**0.6045**

Mean Value of Total Sales = 108,839,000/140 = #777,421.43

$$1 - \Sigma ZQ$$

Gini coefficient = 1-∑ ZQ = 1-0.6045 =0.3955

Lorenz Curve of Fish Marketers and Markets in Oyo State is presented in Figure 2, the straight line represents the line of equality representing a perfect market which deduced that 50% of the market population is meant to obtain 50% of the market share **(fair income distribution).** The Lorenz curve of Oyo State market representing a curve closer to a perfect market deduced that 98% of the population (respondents) obtained 60% of the market share **(between fair and unfair income distribution) or (Perfect and almost a Perfect market).**

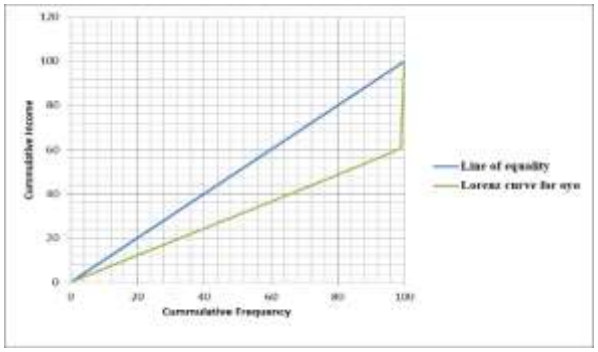

Figure 2: Lorenz Curve of Fish Marketers and Markets in Oyo State

Table 4 shows that 80.0% of respondents posited that there were no barriers preventing people from participating in the fish marketing industry which indicates that the Oyo market structure encouraged easy entry of more fish marketers as the barriers of the market entry is very low. It was gathered that 11.4% of the respondents revealed capital as the barrier to entry, 85.0% of the respondent had no barrier while the remaining respondents (3.6%) revealed high license cost, high tax, age, sex, location, group tied as their barriers to entry. This result implies that capital is the major barrier to entry among fish marketers. This agrees with Madugu & Edward (2011), who found that poor access to capital was the most pressing problem of fish marketing in

***Corresponding Author:** Fapohunda, O.O.

Adamawa state. Also, majority of the respondents (85.7%) revealed that fish marketers are free to exit the industry at any time they wish to leave. The result therefore concluded that the fish marketers are free to exit the fish industry at any time. The table shows that 32.9% of the respondents sold frozen fish, 22.9% of the respondent sold smoked fish, 19.3% of the respondent sold fresh fish, 15.7% sold both smoked and fresh fish, 1.4% sold both fresh and frozen fish, 2.1% sold smoked and fresh and frozen fish, and 5.7% sold fried fish. The result revealed that higher percentages fish marketers sell frozen, smoked and fresh fish while fewer percentage of the marketers sell fried fish. This result implies that refrigeration and smoking is the major ways of preserving and processing in the study area. Furthermore, 40.7% of respondents marketed cultured fish (catfish and tilapia, 50.0% of the respondent's marketed captured fish while 9.3% marketed both cultured and non-cultured fish. This revealed that fish marketers sell both cultured and captured fish which gives room for different varieties of fish for consumers. The distribution of fish differences among marketers in the study area revealed that there were fish difference with high percentage in 5.0% (National Agency for Food and Drug Administration and Control number), 9.3% (Taste) and 13.6% (Packaging). Furthermore, the result shows that 64.3% of the respondents claimed that there were no differences in the fish they sell. This implies that marketers sell more of homogeneous fish products and less of heterogeneous fish products. Personal interaction/contact (verbal message) was the most common means of seeking market information among respondents with a high percentage of 74.3%. The result shows that fish marketing is increasing as revealed by 83.6% of the respondents. The increase suggests an increase in the demand for fish because fish has become an important source of protein and people have been enlightened that fish is good for the health of human. Conversely, this is expected to have a multiplier effect on the income of fish marketers, thereby increasing the market efficiency.

Table 4. Structure of Fish Market

Variables	Frequency	Percentage (%)
Barriers of entering fish marketing industry		
Yes	21	15
No	112	80
Barriers of entering fish marketing industry		
High capital	16	11.4
High license	3	2.1
High tax	0	0
Age barrier	0	0
Sex barrier	1	0.7
Location barrier	1	0.7
Group tied	0	0
No barrier	119	85
Barriers of exiting the fish marketing industry		
Yes	8	5.7
No	120	85.7
No response	12	8.6
Forms of fish		
Smoked Sundried	32	22.9
Fresh	27	19.3
Fried	8	5.7
Frozen	46	32.9
Smoked & Fresh	22	15.7
Smoked & Frozen	0	0
Fresh & Frozen	2	1.4
Smoked & Fresh & Fried	0	0
Smoked & Fresh & Frozen	3	2.1
Classification of fish		
Cultured fish (catfish &Tilapia)	57	40.7
Non captured (wild) fish	70	50.0
Cultured and Captured fish	13	9.3
Product differentiation		
NAFDAC	7	5.0
Shape	4	2.9
Taste	13	9.3
Colour	2	1.4

***Corresponding Author:** Fapohunda, O.O.

Packaging (Labelling)	19	13.6
Ingredient	1	0.7
Size	2	1.4
Long shelf life	2	1.4
The same	90	64.3
Source of information		
Personal interaction/contact	104	74.3
Phone call	9	6.4
Internet	7	5.0
Radio/Television	4	2.9
Pamphlet	2	1.4
Personal interaction & Phone call	2	1.4
No means of information	12	8.6
Status of market		
Increasing	117	83.6
Decreasing	8	5.7
Fluctuating	7	5.0
No response	8	5.7

Source: Field survey, 2021

Conduct of Fish Market is presented in Table 5, which showed that most of the fish marketers (45.0%) determined their selling price based on their marketing cost of fish and the profit desired to gain. Majority (63.6%) of the respondents uses weighing scale as their unit of measurements; this degree of market transparency implies that most of the seller and the buyer won't be exploited. Greater proportion of membership of associations (81.7%) in this study area helps marketers in different associations to enhance their marketing activities through easy access to credit facilities that may likely come to the group rather than to an individual, getting good prices for commodities through collective bargaining and tax concessions due to their large number, bargaining power and influence, enhance information dissemination and efficient marketing of fish. This finding corresponds with Salau *et al*. (2017) who presented a great number of marketers belonging to different associations and also disagrees with the findings Agbebi & Adetuwo (2018) that most of the fish marketers do not belong to any association. Also, most (75.7%) of the respondents pay association dues, it revealed that fish marketers were active in their various associations; this could leads to effective running of the fish business. 80.7% of the respondents enjoy benefits from loan, supply inputs, price fixing, advertisement, transportation etc. while the remaining 19.3% of the respondents enjoy no benefit from association. Thus, these opportunities would bring expansion to the business. 42.9% revealed that consumers buy meat when the price of fish is high and since 27.1% of respondents still revealed that buyers purchase fish when price of fish is high, it means that the fish market is still efficient because the market is not abandoned even when the price of fish is high. Also, this result denotes that some people are aware of the health benefit of fish. The result also revealed that meat and fish constitute the major protein the marketers sell and the buyers consumes. The result also implies that if the price of fish is high, the demand of meat will increase and vice versa. This result revealed that majority (92.1%) of the respondents makes use of both Open display and personal persuasive effort to attract their customers. This result agrees with Afolabi (2004) that noted that majority of the sellers of agricultural products used both open display and persuasive methods to draw the attention of consumers. More than half (51.4%) of the respondents revealed that Bus/taxi/lorry was the dominant method of transporting fish among fish marketers. This could have accounted for their preferences, conveniences in the choice of method of fish transportation and large landscape. Greater proportion (64.3%) of respondents had no risk in the business. This revealed that fish marketers are faced with less risk if necessary principles guiding the business are followed properly. The distribution on the incentives respondents use in persuading their customers revealed that majority of the fish marketers use price discount (60.7%) as their incentives to persuade customers to purchase their fish product subsequently.

Table 5. Conduct of Fish Market

Variables	Frequency	Percentage
Pricing of Fish		
Marketing cost and returns	63	45.0
Bargaining power	17	12.1
Prices set by competitors	5	3.6

***Corresponding Author:** Fapohunda, O.O.

Forces of demand and supply	20	14.3
Standardized fixed price	35	25.0
Units of measurements		
Basket	6	4.3
Cartons	33	23.6
Hand/Manual sorting	10	7.1
Weighing Scale	89	63.6
Basket and Weighing balance	2	1.4
Membership of association		
Cooperative Society	44	31.4
Fish Marketing Society	34	24.3
General Marketing Union	2	1.4
Fish Association of Nigeria	33	23.6
No Association	27	19.3
Regularity of Payment of Association dues		
Daily	4	2.9
Weekly	33	23.6
Monthly	43	30.7
Yearly	26	18.6
No payment	34	24.3
Benefits derived from association		
Loans	35	25
Supply inputs	8	5.7
Price fixing	17	12.1
Advertisement	15	10.7
Transportation	4	2.9
Save money	5	3.6
Give information	14	10
Unity and occasions	15	10.7
No benefit	27	19.3
Alternative choice when price of fish is high		
Meat	60	42.9
Pork	3	2.1
Goat	5	3.6
Chicken	11	7.9
Fish	38	27.1
Pomo	5	3.6
Egg	18	12.9
How respondents attract customers		
Open display	40	28.6
Personal persuasive effort	72	51.4
Television/Radio/Pamphlets Advertisement	11	7.9
Open display and Personal persuasive effort	17	12.1
Means of transporting fish by respondents		
Motorcycle/Tricycle	13	9.3
Bus/Taxi/Lorry	72	51.4
Feet	5	3.6
Sell at the pond	50	35.7
Marketing risk of the respondents		
Selling on credit and not pay	40	28.6
Theft	4	2.9
Spoilt	6	4.3
No risk	90	64.3
Incentives used in persuading customers		
Bonus	26	18.6
Price discount	85	60.7
Free transport services	5	3.6
High quality	10	7.1
Bonus & price discount	4	2.9
No incentives	10	7.1

***Corresponding Author:** Fapohunda, O.O.

Source: Field survey, 2021

Performance of Fish Marketing: Performance Analysis of Fish Marketing among Producers, Wholesalers and Retailers in Oyo State

The result in tables 6, 7 and 8 showed that each producer earned average revenue of ₦617,475.00 but incurred average variable cost of ₦441,825.00 and an average fixed cost of ₦46,730.00, each wholesaler earned average revenue of ₦2,971,800.00 but incurred average variable cost of ₦2,174,500.00 and average fixed cost of ₦247,300.00 and each retailer earned average revenue of ₦308,800.00 but incurred average variable cost of ₦234,875.00 and average fixed cost of ₦20,940.00 over the same period of one (1) month. This indicates that an average producer earned ₦175,650 as gross profit and ₦128,920 as net profit, an average wholesaler earned ₦797,300.00 as gross profit and ₦550,000.00 as net profit and an average retailer earned ₦73,925 as gross profit and ₦52,985.00 as net profit, revealing that fish marketing is a profitable venture among fish marketers in the study area. This indicates that the fish producer, wholesaler and retailer respectively were able to make 28%, 27%, 24% and of the revenue obtained as their gross profit and 21%, 19%, 17% of their revenue as net profit. The result implies that fish market is profitable since the gross profit (Total Revenue minus Total Variable Cost) and net profit (Total Revenue minus Total Cost) are not negative but positive. These should encourage more entrants into the business and a sustainable business of fish marketing in Oyo State. The tables show that marketing margin of 38%, 36% and 34% were recorded for producers, wholesalers and retailers respectively. The result thereby revealed that producers, wholesalers and retailers exploit their customers by 38%, 36% and 34% respectively. Results in the tables showed that the market efficiency figures among respondents who are producers in the study area are greater than 100% (i.e. 140%, 137% and 131% for producers, wholesalers and retailers respectively) indicates that fish marketing activities is efficient. The finding corresponds with the study of Babalola *et al.* (2015) who reported a market efficiency of 133%. From the tables, the operational efficiencies of 126%, 123% and 121% for producers, wholesalers and retailers respectively were shown. This revealed that fish marketing among respondents were operationally efficient (i.e TR/TC>100% = operationally efficient, TR/TC<100% = operationally inefficient).

Table 6. Computation of Profitability Analysis of 40 Producers in Oyo State

Profitability Analysis of 40 Producers in Oyo State	
Total revenue : Sales of Fish	24,699,000.00
Average revenue	617,475.00
Variable Cost	
Purchase Cost	15,228,500.00
Average Purchase Cost	380,712.50
Other Variable Expenses	2,444,500.00
Total Variable Cost	17,673,000.00
Average Variable Cost	441,825.00
Total Fixed Cost	1,869,200.00
Average Fixed Cost	46,730.00
Total Cost	19,542,200.00
Average Total Cost	488,555.00
Gross Profit (TR-TVC)	7,026,000.00
Average Gross Profit	175,650.00
Gross Profit Margin (GP/TR)	0.28
Average Gross Profit Margin	0.28
% Gross Profit Margin	28%
Net Profit (TR-TC)	5,156,800.00
Average Net Profit	128,920.00
Net Profit Margin (NP/TR)	0.21
Average Net Profit Margin	0.21
% Net Profit Margin	21%
Marketing Margin of 40 Producers in Oyo State	
Revenue or selling price	24,699,000.00
Purchase cost or buying price	15228500.00
Marketing margin = $\frac{TR-PP}{TR}$	0.38
%Marketing margin = $\frac{TR-PP}{TR} \times 100\%$	0.38 x 100 = 38%
Total revenue	24,699,000.00

***Corresponding Author:** Fapohunda, O.O.

Total variable cost		17673000.00
Marketing efficiency =	TR / TVC	1.40
%marketing efficiency = TR / TVC x 100%		140%
Operational Efficiency		
Total revenue		24,699,000.00
Total cost		19542200.00
Operational efficiency =TR/TC		1.26 TR/TC>1 = operationally efficient
% operational efficiency		126% TR/TC>100% = operationally efficient

Source: Field Source, 2017

Table 7. Computation of Profitability Analysis of 20 Wholesalers in Oyo State

PROFITABILITY ANALYSIS OF 20 WHOLESALERS IN OYO STATE	
Total Revenue: Sales Of Fish	59,436,000.00
Average Total Revenue	2,971,800.00
Variable Cost	
Purchase cost	37,976,000.00
Average purchase cost	1,898,800.00
Other variable expenses	5,514,000.00
Total Variable Cost	43,490,000.00
Average Variable Cost	2,174,500.00
TOTAL FIXED COST	4,946,000.00
AVERAGE FIXED COST	247,300.00
TOTAL COST	48,436,000.00
AVERAGE TOTAL COST	2,421,800.00
GROSS PROFIT (TR-TVC)	15,946,000.00
AVERAGE GROSS PROFIT	797,300.00
GROSS PROFIT MARGIN (GP/TR)	0.27
AVERAGE PROFIT MARGIN	0.27
% GROSS PROFIT MARGIN	27%
NET PROFIT (TR-TC)	11,000,000.00
AVERAGE NET PROFIT	550,000.00
NET PROFIT MARGIN (NP/TR)	0.19
AVERAGE NET PROFIT MARGIN	0.19
% NET PROFIT MARGIN	19%
MARKETING MARGIN OF 20 WHOLESALERS IN OYO STATE	
REVENUE or SELLING PRICE	59,436,000.00
Purchase cost or buying price	37,976,000.00
Marketing margin = TR-PP / TR	0.36
%Marketing Margin = TR-PP / TR x 100%	0.36 x 100 = 36%
Efficiency of 20 wholesalers in oyo state	
Total revenue	59,436,000.00
Total variable cost	43,490,000.00
Marketing efficiency = TR / TVC	1.37
%Marketing Efficiency = TR / TVC x 100%	137%
Operational efficiency	
Total Revenue	59,436,000.00
Total Cost	48,436,000.00
Operational Efficiency =TR/TC	1.23 TR/TC>1 = operationally efficient
% Operational Efficiency	123% TR/TC>100%=operationally efficient

Source: Field Source, 2021

***Corresponding Author:** Fapohunda, O.O.

Table 8. Computation of Profitability Analysis of 80 Retailers in Oyo State

Profitability analysis of 80 retailers in oyo state	
Total revenue : sales of fish	24,704,000.00
Average total revenue	308,800.00
VARIABLE COST	
Purchase cost	16,390,000.00
Average purchase cost	204,875.00
Other variable expenses	2,400,000.00
Total variable cost	18,790,000.00
Average total variable cost	234,875.00
TOTAL FIXED COST	1,675,200.00
AVERAGE TOTAL FIXED COST	20,940.00
TOTAL COST	20,465,200.00
AVERAGE TOTAL COST	255,815.00
GROSS PROFIT (TR-TVC)	5,914,000.00
AVERAGE GROSS PROFIT	73,925.00
Gross profit margin (GP/TR)	0.24
Average gross profit margin	0.24
% Gross Profit Margin	24%
NET PROFIT (TR-TC)	4,238,800.00
AVERAGE NET PROFIT	52,985.00
Net profit margin (NP/TR)	0.17
Average net profit margin	0.17
% net profit margin	17%
Marketing Margin Of 80 Retailers In Oyo State	
Revenue or selling price	24,704,000.00
Purchase cost or buying price	16,390,000.00
Marketing margin = $\frac{TR-PP}{TR}$	0.34
%Marketing Margin = $\frac{TR-PP}{TR} \times 100\%$	0.34 x 100 = 34%
Efficiency Of 80 Retailers In Oyo State	
TOTAL REVENUE	24,704,000.00
TOTAL VARIABLE COST	18,790,000.00
MARKETING EFFICIENCY = $\frac{TR}{TVC}$	1.31
%MARKETING EFFICIENCY = $\frac{TR}{TVC} \times 100\%$	131%
Operational Efficiency	
Total Revenue	24,704,000.00
Total Cost	20,465,200.00
Operational Efficiency =TR/TC	1.21 TR/TC>1 = operationally efficient
%Operationa Efficiency	121% TR/TC>100 = operationally efficient

Source: Field Source, 2021

Factors influencing income of Fish Marketers in Oyo State is presented in Tables 9. It was revealed that in Oyo State, two variables (Gender and Purchase cost) were statistically significant. Gender was found to be positive and significant at P-value< 0.05. This implies that the sexes of marketers influence the income obtained in the fish marketing business. Purchase cost was found to be positive and significant at P-value<0.01. This reveals that an increase in purchasing cost will lead to increase in the income of fish marketers, thus increasing the efficiency of fish marketing. This implies that as fish marketers produced and purchased high quality fish products, thereby spending more on value addition, packaging of fish to be marketed, there is an increase in the purchasing cost of fish. This conforms to the findings of Foluso & Taiwo (2018) that a unit increase in the purchasing cost of fish product would lead to an increase in the income of the fish marketers.

Table 9. Regression Analysis on Factors Influencing Income of Fish Marketers in Oyo State

Variables	**Coefficient**	**Standard Error**	**t-ratio**	**P-value**

***Corresponding Author:** Fapohunda, O.O.

(Constant)	-135618.226	97061.539	.168	.168
Sex of the respondents	95175.604	45978.849	.043	.043
Age of the respondents	2049.728	1920.227	.290	.290
Household size	2668.599	6683.298	.691	.691
Marital Status of the respondents	-46686.142	49256.837	.347	.347
Years of schooling	3169.446	2976.936	.291	.291
Interest rate on loan obtained	-648.242	1285.247	.616	.616
marketing experience	1920.951	2141.150	.373	.373
benefit derived	-1254.218	1260.059	.324	.324
Attraction	989.834	1211.591	.417	.417
product differentiation	-629.918	976.926	.522	.522
purchase cost	1.508	.014	.000	.000
R Square	.996			
Adjusted R Square	.994			
F-Value	802.498			

*Significant at 10%, **Significant at 5%, ***Significant at 1%.

Source: Field survey, 2021

Constraints of fish marketing in Oyo State were shown in Table 10. The problems faced by fish marketers were ranked according to their severity which were analyzed by Likert scale with mean score of 3.50 and above considered to be serious constraint affecting fish marketing in Oyo State. From the result, constraints which ranked 1st to 14th were considered as serious constraints.

Table 10. Distribution on Constraints of Fish Marketing in Oyo State

Constraints of Fish Marketing	**SA**	**A**	**N**	**D**	**SD**	**((SA*5) + (A*4) + (N*3) + (D*2) + (SD*1))**	**MEAN**	**RANK**
Poor access to Capital	300	168	102	8	0	578	4.1	1st
There is no Storage Facilities/holding tanks	140	192	90	28	8	458	3.3	18th
Insufficient number of cold rooms	190	112	150	48	10	510	3.6	8th
The cost of processing the fish is high	150	160	168	28	0	506	3.6	9th
There is no processing facilities/smoking kiln	60	184	168	40	4	456	3.3	20th
Long distance to processing centres	80	112	192	52	6	442	3.2	23rd
Customers complain that the price of fish is high	200	216	72	32	6	526	3.8	6th
Cost of fish is high from the Producer	80	168	168	36	8	460	3.3	17th
There is poor patronage (low demand)	110	112	168	60	4	454	3.2	21st
Inadequate supply of fish from the producer	20	120	198	64	8	410	2.9	25th
Unreliable/Untimely supply of fish from the producer	20	104	180	84	6	394	2.8	26th
Small size/inadequate supply of fish from producers/source	70	112	186	56	10	434	3.1	24th
Highly perishability of fish	140	136	180	24	6	486	3.5	14th
Frequent fluctuation in price	110	168	204	16	0	498	3.6	12th
Erratic/Epileptic supply of electricity	210	120	168	20	2	520	3.7	7th
Unorganized market	130	184	168	24	0	506	3.6	9th
Inconsistent and high cost of transportation	160	136	174	32	0	502	3.6	11th
Inaccessibility of road to the market/poor transportation network	110	136	198	20	8	472	3.4	16th
Inadequate transport means	50	160	192	36	8	446	3.2	22nd
There is no Government assistance	230	144	150	8	4	536	3.8	3rd
Inconsistence/Inadequate Government policy	190	152	180	4	2	528	3.8	5th
Scarcity of fuel (petrol, firewood, kerosene)	100	144	162	44	6	456	3.3	19th
High rate of interest on Loan	200	136	180	12	0	528	3.8	4th

***Corresponding Author:** Fapohunda, O.O.

Poverty of the consumer	170	216	150	4	0	540	3.9	2nd
High loss from spoilage	90	152	210	16	6	474	3.4	15th
High rent (shop)	130	152	198	16	2	498	3.6	13th

Source: Field Survey, 2021

CONCLUSION

The result revealed that the fish marketing in Oyo State is close to a Perfect market with Gini Coefficient of 0.3955. This result also revealed that fish marketing in Oyo State is profitable and efficient. Based on the findings, it is essential that fish marketing system in Oyo State should improve their market structure and market conduct to ensure efficiency in the market performance, in order to become a Perfect market.

Recommendations

- Access to loans from different financial institutions with very low interest rate (soft loans), should be made available to individual and cooperative groups.
- Effective extension education is necessary at regular intervals to monitor the functional activities in fish marketing for overall efficiency.
- Marketers associations or cooperatives should embark on enlightenment programme that would reduce the marketing cost in order to increase the marketing efficiency.
    - Improvement of infrastructures such as electricity and road has become critical to the survival of the agricultural industry which the fishery industry is not an exemption.

REFERENCES

1. Adeleke, M. L., & Afolabi, J.A. (2012). Appraisal of Fresh Fish Marketing in Ondo State, Nigria: *IIFET Tanzanian Proceedings*
2. Adewumi, M.O., Ayinde, O.E., Adenuga, A.H. and Zacchaeus, S.T. (2012), "The Profitability Analysis of Artisanal Fishing in Asa River of Kwara State, Nigeria". *International Journal of Development and Sustainability*, 1(3), 932-938
3. Afolabi, J. A. (2004). An Evaluation of Beef Marketing in Osun State, Nigeria. *Journal of Agriculture, Forestry and Fisheries*, *5*(2), 29-32.
4. Agbebi, F. O., & Adetuwo, K. I. (2018). Analysis of socio-economic factors affecting fish marketing in Igbokoda Fish Market, Ondo State, Nigeria. *International Journal of Environment, Agriculture and Biotechnology*, *3*(2), 239094.
5. Ali, E. A., Gaya, H. I. M., & Jampada, T. N. (2008). Economic analysis of fresh fish marketing in maiduguri gamboru market and kachallari alau dam landing site of Northeastern Nigeria. *J. Agric. Soc. Sci*, *4*, 23-26.
6. Babalola, D. A., Bajimi, O., & Isitor, S. U. (2015). Economic potentials of fish marketing and women empowerment in Nigeria: Evidence from Ogun State. *African Journal of Food, Agriculture, Nutrition and Development*, *15*(2), 9922-9934.
7. Bain J. S. (1968). *Industrial Organization* (2nd Ed.). John Wiley and Sons, New York
8. Central Bank of Nigeria (2012). *Statistical Bulletin*: Financial Statistics. Second Quarter. Abuja, Nigeria Retrieved from http://www.cenback.org/documents/statbulletin.asp .
9. Dağtekin, M., Ak, O., & Emeksiz, F. (2007). Socio-economic analysis and marketing patterns of the fish farming industry in Trabzon. *Turkey, assessed online from: www. fao. org/docrep/012/i1373e92. pdf*.
10. Esiobu, N. S., Onubuogu, G. C., & Okoli, V. B. N. (2014). Determinants of income from poultry egg production in Imo State, Nigeria: an econometric model approach. *Global Advanced Research Journal of Agricultural Science*, *3*(7), 186-199.
11. Osundare, F., & Adedeji, T. (2018). Economic analysis of market performance of fresh fish in Lagos State, Nigeria. *Int. J. Environ., Agric. Biotech*, *3*(2), 595-599.
12. Hibbard, J.(2017). Marketing. Britannica Academic.
13. Osundare, F., & Adedeji, T. (2018). Economic analysis of market performance of fresh fish in Lagos State, Nigeria. *Int. J. Environ., Agric. Biotech*, *3*(2), 595-599.
14. Mafimisebi. T.E., Oguntade, A. E., & Mafimisebi, O. E. (2010). Re- Engineering Agriculture for enhanced Performance through Financing. *Journal of Economics, Finance and Administrative Sciences*, 15(29), 35-49.
15. National Bureau of Statistics. (2012). *Annual Abstract of Statistics*. Nigeria Bureau of Statistics, Abuja, Nigeria. Available at www.nigerianstat.gov.ng
16. National Population Commission. (2006). the Population Census of the Federal Republic of Nigeria. *Analytical report at the National Population Commission- Abuja*. National Population Commission (NPC). *The Population Census of the Federal Republic of Nigeria*.
17. Bassey, N. E., Uwemedimo, E. O., Uwem, U. I., & Edet, N. E. (2015). Analysis of the determinants of fresh fish marketing and profitability among captured fish traders in South-South Nigeria: the case of Akwa Ibom State. *British Journal of Economics, Management and Trade*, *5*(1), 35-45.
18. Nwabunike, M. O. (2015). The Socio-economic characteristics of fish marketers in Abakiliki metropolis of Ebonyi State. *International Journal of Animal Health and Livestock Production Research*, *1*(1), 28-36.
19. Nwaru, J. C., Nwosu, A. C., & Agommuo, V. C. (2011). Socio-economic determinants of profit in wholesale and retail banana marketing in Umuahia

***Corresponding Author:** Fapohunda, O.O.

agricultural zone of Abia State, Nigeria. *Journal of sustainable development in Africa*, *13*(1), 200-211.

20. Ojo, A. O., Mustapha, A., & Ojo, M. A. (2016). Analysis of Marketing Efficiency of Tomato Fruits in Abuja Municipal Area Council, Nigeria.
21. Ojo, A. O. (2013). Analysis of spatial and temporal pricing efficiency of rice markets in Kwara and Niger States, Nigeria. *An Unpublished Ph. D. Dissertation, Department of Agricultural Economics and Extension, Federal University of Technology, Minna, Nigeria*.
22. Onubuogu, G. C., Esiobu, N. S., Nwosu, C. S., & Okereke, C. N. (2014). Resource use efficiency of smallholder cassava farmers in Owerri Agricultural zone, Imo State, Nigeria. *Scholarly Journal of Agricultural Science*, *7*(8), 142-152.
23. Oyakhilomen, O., & Zibah, R. G. (2013). Fishery production and economic growth in Nigeria: Pathway for sustainable economic development. *Journal of Sustainable Development in Africa*, *15*(2), 99-109.
24. Wikipedia (2008*). Gini coefficient*. Available @ http.//en.wikipedia.org/wiki/
25. Salau, S. A., Popoola, G. O., & Nofiu, B. N. (2018). Analysis of cashew nuts marketing in Kwara State, Nigeria. *FUOYE Journal of Agriculture and Human Ecology*, *1*(1).
26. Zabbey, N. (2010). Exporting Shrimp Farming to Nigeria: Implications for Rural Livelihood and Mangroves in the Niger Delta. Centre for Environment. *Human Rights and Development (CEHRD). Eleme, Nigeria*.

***Corresponding Author:** Fapohunda, O.O.