Fish Marketing: A Panacea towards Sustainable Agriculture in Ogun State, Nigeria

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Abstract—This study assessed fish marketing as panacea towards sustainable agriculture in Ogun State, Nigeria. Multi-stage sampling technique was used in the selection of 150 fish marketers for this study. Descriptive statistics were used for the objectives while Product Pearson Moment Correlation was used to test the hypothesis. Result of the findings revealed that the mean age of the respondents was 38.60 years. Majority (93.33%) of the respondents had acceptable levels of formal education. Many (44.00%) of the respondents had spent 1-5 years in fish marketing. The average quantity of fish sold in a day was 94.10kg. However, efficient fish marketing were hindered by inadequate processing equipment, storage rooms and ice holding facilities (86.67%). There was a significant relationship between socio-economic characteristics and profit realized from fish marketing ($p < 0.05$). It was recommended that storage and warehousing facilities should be provided to the fish marketers in the study area.

Keywords—Fish marketers, panacea, retail markets, sustainable.

I. INTRODUCTION

FISH is a major source of animal protein and essential food items in the diet of many Nigerians [1]. It is relatively cheaper than beef, chicken, mutton and turkey. Fish supply in Africa has been declining while the demand has increased due to rise in population [2]. Fish marketing is the performance of activities involve in the flow of fish and fish products from the point of initial production to the final consumers [3]. It is one of the important aspects of fisheries management without which production is not complete if the fish and fish products do not reach the final consumers. Marketing is the management process whereby the needs of customers are met efficiently and profitably as possible. An efficient marketing system allows perishable products to reach consumers in good quality [4]. The common fish species that are readily available in Nigeria markets include Tilapia, Catfish, Mackerel, Bonga, Sandinella, Moonfish, and Ilisha. These species could be found in the Coastal and Island rural areas where incomes are generally low. However, some resourceful fish marketers specialize in the importation of certain fish species or get it

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from the fishermen at landing sites. For example in Nigeria mackerel and horse mackerel and even lady fish are imported by these marketers. Fish producers and marketers determine the price at which fish and fishery products are sold to the consumers. The prices are usually fixed but there is flexibility to allow for changes in the marketing conditions (supply and demand) at different seasons. Prices are differentiated according to fish species, weight, size, quantity and the source of supply which may vary from one fish marketer to another [3]. Rural women dominate the processing and marketing of fish in Nigeria using traditional methods and equipment in their trade [5]. Many of these fish traders operate with very small capital and for some of them, a container of fish that is, basket, head-pan, carton or crates may be all the investment needed to commence business. Owing to their limited capital and lack of adequate storage facilities, these traders purchase only a small quantity of fresh fish (50-100kg) at a time for retail or processing [6]. The determination of retail prices is very difficult because huge profits and losses are incurred. Several factors influence the prices of fish in the retail market and these include, demand for particular fish species; flexibility of shift in demand; preferences and substitution between meat and fish; distance from sub-depot; and location of the market in terms of income level of the consumers [2]. Furthermore, losses by theft, accidents, and spoilage have to be taken into account since the storage facilities in retail markets are poor. If the retailer does not sell all his/her product in the early hours of the morning, rapid thawing resulting in drip loss and general deterioration forced the marketer to sell out at a reduced price [7]. The physical deterioration that is noticeable in fresh fish when transported from one place to the other is usually the result of poor packaging [3]. The study is a direct response to 'clients' need to elucidate the role of fish marketing in poverty alleviation, national food security priorities and future development. Until recently, all efforts have been geared towards producing more without thinking about how to market them. There is need to know about new technologies in food storage and preservation. There is also need for research on consumer demands and preferences, handling and packaging. Sustainable Agriculture is directly related to sustainable development of contributions of fishery, viability of fishing community, and especially positive economic performance of fishing activity. Hence, measuring the performance of a fisheries management arrangements is integral to ensuring its long term viability and sustainability and any rational and comprehensive fishery management should take into account

not only production aspect but also effective marketing dimensions of fishery. Objectives of this study were to:

i.   describe personal characteristics of the fish marketers in the study area
ii. identify the categories of fish and units of measurement in the study area
iii. identify the sources of capital utilized by the fish marketers in the study area
iv. determine the profitability of fish marketing in the study area
v.   identify the constraints faced by fish marketers in the study area

The Hypothesis of this study was stated in null form as: H_{01}: There is no significant relationship between socio-economic characteristics of the respondents and profit generated from fish marketing.

II. MATERIALS AND METHOD

The study was carried out in Ogun State of Nigeria. The State has twenty (20) Local Government Areas with its capital at Abeokuta. Multi-stage sampling technique was used in the selection of respondents for this study. There are four zones of Ogun State Agricultural Development Programme (OGADEP) comprising Abeokuta, Ilaro, Ijebu-Ode and Ikenne. First stage, 50% of zones were randomly selected (i.e. Abeokuta and Ijebu-Ode zones). Second stage, three retail markets were randomly selected in each of the selected zones (i.e. Kuto, Omida, Lafenwa, Oke-Aje, Ita-Osa and Ita-Ale). Finally, 25 marketers were randomly selected from each of the selected markets to make 150 respondents sample size for this study.

A. Data Collection Method

The instrument used for the data collection was subjected to content validity by consulting experts in the field of Agricultural Extension and Rural Development. Items found ambiguous were removed. Test-retest was carried out with twenty-five marketers who were not part of this study to ascertain the reliability of the instrument.

B. Measurement of Variables

Age, household size, fish marketing experience, and quantity of fish sold were measured at interval level while educational level, membership of association, categories of fish marketed, sources of capital, and units of measurement in the markets were measured at nominal level. Constraints to fish marketing were measured by the use of three alternative answers. These were not serious, mild, very serious assigned 1 mark, 2 marks and 3 marks respectively.

C. Data Analysis

Simple descriptive statistics such as percentage, mean and frequency were used to analyze the objectives. Cost and returns analysis was used to estimate the gross margin and net income. In computing gross margins apart from considering the differences between the selling and purchase price, expenses incurred before the sales of fish like cost of transportation, icing facilities were taken into account. Gross margin is the difference between the gross income and the total variable cost.

$$GM = TR - TVC, \text{ Where;}$$
GM = Gross Margin
TR = Total Revenue
TVC = Total Variable Cost

Net Income is the difference between total revenue and total cost.

$$NI = TR - TC \text{ where;}$$
TC = TVC + TFC
NI = Net Income
TC = Total Cost
TFC = Total Fixed Cost

Ranking was another statistical tool/measure used. Ranking in this study was used to determine the category and magnitude of each constraint over the other. Pearson correlation analysis was used to test the hypothesis.

III. RESULTS AND DISCUSSION

A. Socio-Economic Characteristics of Respondents

The result in Table I showed that the mean age of the respondents was 38.60 years. Most (53.33%) of the respondents were within the age group of 31-40 years while 30.00% were above 40 years. This is indicating that most of them are within the economically active population and therefore constitute a good labor force for fishery enterprise with the expectation that they would be good managers of limited available resources and can withstand rigors associated with the trade. This finding is in consonance with [8] who stated that people who are young are more prone to risk taking than the old, hence tends to adopt innovations. Majority (93.33%) of the respondents had acceptable levels of formal education. They can read and write and solve arithmetic problems. Out of these figures 29.33% had primary school education, 49.33% had secondary school education while 14.67% had tertiary education. Only very few (6.67%) did not have formal education. The mean household size was 4 people. Majority (70.67%) of the respondents had 1-4 people in their families while 22.66% had 5-8 people. Only very few (6.67%) of the respondents had more than 8 people their household. This finding showed that there were enough hands (family labor) engaged to carry out fish marketing operations. This result agrees with [9] who said that the number of persons in a family pave way for use of family labor fish processing and marketing but may also imply that a large percentage of income would go for consumption. The result also indicated that below half (44.00%) of the respondents had spent 1-5 years in fish marketing while 36% spent 6-10 years and 20% were in it for more than 11 years. The mean year of marketing experience was 7.20 years. This result indicated that the women got into fish processing and marketing quite early in life and it is not a new enterprise to the people in the study area. The result is in line with the findings of [10] which indicated that age and experience are strengths of fishmonger

businesses. Most (66.67%) of the respondents sold 51-100kg of fish daily while 13.33% sold more 100kg per day. The average quantity of fish sold in a day was 94.10kg. This shows that most of the fish marketers operated small scale business. Furthermore, majority (94.67%) of the respondents were members of fish marketers association and Co-operative Thrift and Credit Society (CTCS) while 5.33% did not belong to any CTCS cooperative society.

TABLE I
DISTRIBUTION OF RESPONDENTS ACCORDING TO THEIR SOCIO-ECONOMIC CHARACTERISTICS (N=150)

Variables	Frequency	Percentage (%)	Mean
Age			
Less than 30	25	16.67	38.60
31-40	80	53.33	
Above 40	45	30.00	
Educational status			
No formal education	10	6.67	
Primary education	44	29.33	
Secondary education	74	49.33	
Tertiary education	22	14.67	
Household size			
1-4	106	70.67	4.00
5-8	34	22.66	
More than	10	6.67	
Fish marketing experience (yrs)			
≤ 5	66	44.00	7.20
6-10	54	36.00	
≤11	30	20.00	
Quantity of fish sold (kg/day)			
≤50	30	20.00	94.10
51-100	100	66.67	
≤100	20	13.33	
Membership of Association			
Yes	142	94.67	
No	08	5.33	

Source: Field survey, 2012

A. Categories of Fish Brought to the Market

Three major categories of fish marketers were identified in the study area. Almost half (44.67%) of the marketers sell smoked fish while 32.00% sell frozen fish and 10.67% are into fried fish. Live and dried fish marketers accounted for about six percent and were not very common in these markets. This is probably due to the fact that smoked fish has a long shelf life due to its reduced moisture content. This agrees with the observation made by [11] who observed that educed moisture content enhances shelf life of fish.

TABLE II
DISTRIBUTION ACCORDING TO THE CATEGORIES OF FISH OFFER FOR SALES (N = 150)

Categories of fish marketed	Frequency	Percentage
Life/fresh fish	09	6.00
Frozen fish	48	32.00
Fried fish	16	10.67
Smoked fish	67	44.67
Dried fish	10	6.66
Total		**100.00**

Source: Field survey, 2012

B. Units of Measurement for Selling Fish

The result in Table III showed that most (58.67%) of the respondents sold through Hand/Manual sorting with determined prices while 23.33% used weighing scale and 11.33% used carton for the same purpose. About seven percent used baskets to sell their fish.

TABLE III
DISTRIBUTION ACCORDING TO THE MEASUREMENT USE FOR SELLING THE FISH (N = 150)

Units of measurement	Frequency	Percentage
Baskets	10	6.67
Carton	17	11.33
Weighing scale	35	23.33
Hand/Manual sorting	88	58.67
Total		**100.00**

Source: Field survey, 2012

C. Sources of Capital

The money used in the business is sourced from Cooperative, Personal savings, Banks and borrowing from Friends and Family. Result in Table IV revealed that almost half (44.00%) of the respondents got their capital from personal savings while 33.33% sourced the capital from their co-operatives and 19.34% borrowed from their friends and relatives. Loans from commercial banks accounted for only three percent. The result showed that banks have not made significant impact as their credit facilities are not readily available to the fish marketers in the study area.

TABLE IV
DISTRIBUTION ACCORDING TO THE SOURCES OF CAPITAL (N = 150)

Sources of capital	Frequency	Percentage
Personal savings	66	44.00
Friends and relatives	29	19.34
Cooperative /Association	50	33.33
Banks	05	3.33
Total		**100.00**

Source: Field survey, 2012

D. Cost and Returns of Fish Marketing

Result in Table V showed that the average cost of fresh fish was ₦390,000.00/month. The respondents generated an average income of ₦420,000.00, ₦450,000.00 and ₦465,000.00 with an estimated profit of ₦12,900.00, ₦25,900.00 and ₦21,900.00 per month from frozen fish, smoked fish, and fried fish respectively. This showed that fish marketing as an enterprise is economically viable and

profitable in the study area. This result is consistent with the finding of [12] who observed that fish farming is profitable.

TABLE V
COSTS AND RETURNS FOR FROZEN FISH, SMOKED FISH AND DRIED FISH

Enterprise Items (₦/month)	Frozen fish	Smoked fish	Fried fish
Quantity of fish (kg)	50	50	50
Unit price (₦/kg)	180.00	300.00	310.00
Total Revenue	**420,000.00**	**450,000.00**	**465,000.00**
Variable costs			
Fish purchased ₦260.00/kg	390,000.00	390,000.00	390,000.00
Labour	10,000.00	18,000.00	15,000
Transportation cost	2,500.00	2,500.00	2,500
Fuel (fire wood)/kerosene	-	9000.00	6,000
Vegetable oil	-	-	25,000
Total Variable Cost	**402,500.00**	**419,500.00**	**438,500.00**
Gross Margin	**17,500.00**	**30,500.00**	**26,500.00**
Fixed Cost			
Rent of shop/space	2,500.00	2,500.00	2,500.00
Market tax	1,500.00	1,500.00	1,500.00
LGA tax	600.00	600.00	600.00
Total Fixed Cost	**4,600.00**	**4,600.00**	**4,600.00**
Net Income	**12,900.00**	**25,900.00**	**21,900.00**

Source: Field survey, 2012

E. Constraints to Fish Marketing

The result in Table VI showed that all the respondents (100.00%) ranked inadequate processing equipment as the most serious problem confronting fish marketing in the study area. This was followed by inadequate cold storage rooms and ice holding facilities (86.67%), and poor electricity supply (81.33%). Similarly, fish marketing were seriously affected by non-availability of credit facility from banks (76.67%), poor road network (72.00%), and lack of marketing linkages (71.33%). This finding corroborates that of [13] that credit is an important input for expansion of agriculture. Other constraints to fish marketing were limited agricultural extension service support (68.00%), fuel scarcity (66.00%), poor pricing (63.33%), high cost of fish species (60.67%) and inconsistence in government policy (58.00%).

TABLE VI
DISTRIBUTION BASED ON THE CONSTRAINTS TO FISH PROCESSING (N=150)

Constraints	NS	M	VS	Mean	Rank
Inadequate processing equipment	-	-	150 (100.00)	75.00	1st
Inadequate cold storage rooms and ice holding facilities	-	20 (13.33)	130 (86.67)	71.67	2nd
Poor electricity supply	-	28 (18.67)	122 (81.33)	70.33	3rd
Non-availability of credit facility from banks	-	35 (23.33)	115 (76.67)	69.17	4th
Inadequate Extension service support	-	48 (32.00)	102 (68.00)	68.67	5th
Fuel scarcity	-	51 (34.00)	99 (66.00)	68.50	6th
Lack of Marketing linkages	10 (66.67)	33 (22.00)	107 (71.33)	66.17	7th
Poor road network	12 (8.00)	30 (30.00)	108 (72.00)	66.00	8th
Poor pricing	-	55 (36.67)	95 (63.33)	66.00	8th
High cost of fish species		59 (39.33)	91 (60.67)	65.17	9th
Inconsistency of government policies	-	63 (42.00)	87 (58.00)	64.50	10th

Source: Field survey, 2012. NS - Not Serious, M - Mild, VS - Very Serious
Note: All the values in parenthesis are percentages

F. Relationship between Socio-Economic Characteristics and Profit

The result in Table VII showed that socio-economic characteristics of the respondents such as age, education, household size, marketing experience, quantity of fish sold were significant at $p < 0.05$. This implies that that there is positive and significant relationship between socio-economic characteristic and profit realized from fish marketing. The null hypothesis is rejected and the alternate hypothesis (H_1) that, "*there is significant relationship between socio-economic characteristics of respondents and profit generated from fish marketing*" is therefore accepted. An increase in age of respondent, which can be interpreted as an increase in experience, increases amount of earning. Hence, a respondent with more experience is getting better income and profit. Also, Respondent with large household size is likely to expand her fishing enterprise and get more income. This finding agrees with [14] who explains that household size is an important factor in any rural development intervention, besides the children assist on the farm and other household activities. Similarly, a respondent with higher education will adopt marketing innovations that can facilitate rapid selling, and the more the quantity of fish sold by a marketer, the higher the income.

TABLE VII
RELATIONSHIP BETWEEN SOCIO-ECONOMIC CHARACTERISTICS AND PROFIT

Variables	r	p-value	Decision
Age	0.57	0.00	S
Educational status	0.78	0.00	S
Household size	0.64	0.00	S
Marketing experience	0.67	0.00	S
Quantity of fish sold	0.99	0.00	S
Membership association	0.35	0.00	S

Source: Field survey, 2012 S = significant at $p < 0.05$ level

IV. CONCLUSION

It can be concluded that fish marketers were economically active, experienced and operated on a small scale. The source of capital was through their personal savings. Fish marketing is a profitable venture. However, fish marketing were impeded by myriad of problems such as, Inadequate processing equipment, inadequate cold storage rooms and ice holding facilities, poor electricity supply, non-availability of credit facility from banks, Inadequate Extension service support, and poor road network. However, there was a positive and significant relationship between socio-economic characteristics of the respondents and profit realized from fish marketing.

V. RECOMMENDATIONS

To promote the benefits of fish marketing in Nigeria such as employment opportunities, source of animal protein for small income earners, reduced food insecurity and poverty alleviation it is hereby recommended that:

i. there should be provision of storage and warehousing facilities
ii. there should be provision of affordable credit facilities by financial institutions to the fish marketers
iii. there should be introduction of systems that will ensure good standards in fish handling and marketing
iv. more research work should be carried out to provide information on the marketing strategies that can enhance and sustain effective fish marketing systems in the rural areas.

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