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Marketing and Distribution Channel of Processed Fish in Adamawa State, Nigeria

By A.J., Madugu, A. Edward
Adamawa State University, Mubi, Nigeria.

Abstracts - This study investigated the causal relationship between quantity of fish sold and marketing costs in Adamawa State. Specifically, the profitability was determined and distribution channels identified. Structured questionnaires were used to collect data from 80 fish marketers using purposive and simple random sampling technique from Jimeta, Yola, Gurin and Labondo markets. Analytical tools used were descriptive statistics, market margin and multiple regression analysis. The result showed a margin of 39.8% which could be attributed to the marketing functions. The study identified a decentralized distribution channel in the area. Regression analysis revealed an R2 of 63.8%, F-value of 8.93 and a very low standard error of 0.38889. The result further revealed that initial capital, cost of fish, processing cost and handling charges were positive and significant at different levels indicating that they were the major determinants of selling prices of processed fish in the area. The study concluded that processed fish marketing in the study area was profitable. It recommended that marketers should form a strong co-operative society. There is also a need for government intervention by reducing tax and providing licence to increase the number of micro-credit finance institutions.

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A.J., Madugu[1], A. Edward[2]

Abstract : This study investigated the causal relationship between quantity of fish sold and marketing costs in Adamawa State. Specifically, the profitability was determined and distribution channels identified. Structured questionnaires were used to collect data from 80 fish marketers using purposive and simple random sampling technique from Jimeta, Yola, Gurin and Labondo markets. Analytical tools used were descriptive statistics, market margin and multiple regression analysis. The result showed a margin of 39.8% which could be attributed to the marketing functions. The study identified a decentralized distribution channel in the area. Regression analysis revealed an R^2 of 63.8%, F-value of 8.93 and a very low standard error of 0.38889. The result further revealed that initial capital, cost of fish, processing cost and handling charges were positive and significant at different levels indicating that they were the major determinants of selling prices of processed fish in the area. The study concluded that processed fish marketing in the study area was profitable. It recommended that marketers should form a strong co-operative society. There is also a need for government intervention by reducing tax and providing licence to increase the number of micro-credit finance institutions.

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I. Introduction

In the last two decades, there has been a land slide movement towards markets liberalization in the world. Although the pace and depth of liberalization have varied from place to place, the movement have affected both international and domestic markets and no continent remains untouched (Onu and Iliyasu, 2008). They further explained that the kinds of markets that have emerged from this movement differ markedly across Sectors and Countries. Several studies that examined the marketing system of fish and its implications for agricultural and Economic development in Nigeria in general have employed the relationship between costs and selling prices of fish (Ali *et al.*, 2008). Fish, especially in its dry form is known as the cheapest source of animal protein which supplements about 40% of the protein intake of the Nigerian population (Eyo, 1992). Processed fish has also been recognised as a way out of the ravaging and pervasive protein malnutrition problem (Ladipo *et al.*, 1982, Goeff *et al.*, 1995).

Marketing and distribution channels are important characteristics in the process of getting produce from source to consumers. Olukosi and Isitor (1990) categorized marketing channels into centralized and decentralized channels. Centralized channels deals with agents who serve as middlemen between producers and consumers while decentralized is a kind of channel where both consumers and agents can buy directly from the producers. Fish distribution channel is common to must developing countries with series of middlemen between producers and consumers (Moses, 1992).

Eyo (2001) stressed that processed fish is sold as smoked or dried without varieties as fish fingers, cakes and other ready to serve fish foods to stimulate wider interest in marketing, distribution and consumption. Fish supply and marketing suffer from various set backs ranging from shortage of supply, price fluctuations due to drying up of source, poor distribution and length of chain, spoilage in transit etc. (Tomek and Robinson, 1981). Furthermore, due to the cumbersome nature of fish distribution channel, the local fish seller is faced with the problem of profit maximization. The broad objective of the study was to investigate the causal relationship between quantity of fish sold (distributed) and marketing costs in Adamawa State, North Eastern Nigeria.

II. Methodology

Study Area: The study area was Adamawa State Nigeria. It has a land area of 38.741km^2 lying roughly between latitudes 7^o and 11^o North and between longitudes 11^o and 14^o East of the Greenwich meridian. (Adebayo, 1999). It has an annual rainfall that ranges from 700mm to 1600mm with a mean monthly temperature range of 26.7^{o}c to 27.8^{o}c. The Major occupations of the inhabitants includes fishing, processed fish is major economic activity in the area. Fresh fish cannot be preserved for long, thus it is processed into smoked or dried to add value. This is due to the tropical nature of the area and inadequate storage facilities. Others include farming and rearing animals. Rivers and lakes found in the state include river Benue, Gongola, Chochi and Njuwa lake. Crops grown

About [1] : Dept. of Agricultural Econs. & Ext., Adamawa State University, Mubi, Nigeria.Email : altine_j@yahoo.com
About [2] : Dept. of Biological Sciences, Adamawa State University, Mubi, Nigeria.

are maize, sorghum and cassava while others are cotton groundnuts and sugarcane (Sajo and Kadams, 1999).

III. Data collection and sampling procedure

Purposive and simple random sampling techniques were used. Four markets were selected being the major fish markets in the area. 80 fish processors and marketers were randomly selected using a sampling frame from the four markets in a ratio proportional to market size i.e. 30 in Jimeta market, 20 in Yola market and 15 each in Labondo and Gurin markets. Data for the study were collected through structured questionnaires administered to fish processors and marketers while secondary data were obtained through journals, books, seminar series, newspapers etc. primary data collected includes socio-economic variables, prices, costs and returns, sales and problems associated with processed fish marketing.

IV. Analytical techniques

* The socio-economic characteristics and problems associated with processed fish marketing were analysed using descriptive statistics such as frequencies, percentages and charts.

* Multiple Regression using the ordinary least square (OLS) regression technique was used to determine the effect of marketing cost on the selling price of processed fish (smoke and dried) in the state. The model was specified as follows:-

$$Y=f(X_1, X_2\text{----}X_{10})$$

Where Y=quantity of processed fish distributed in kg/month

X_1= Initial Capital investment
X_2= Cost of fish/kg in (₦)
X_3= Processing cost/kg in (₦)
X_4= Packaging cost/kg in (₦)
X_5= Handling charges/kg (₦)
X_6= Storage Cost (₦)
X_7= Transportation cost/kg (₦)
X_8= Produce tax/kg in (₦)
X_9= Market Union tax (₦)
X_{10}= Local Government tax (₦)
Ui= Error term
Bi= Coefficient of Independent variables to be estimated.

A priori, the coefficients of the independent variables were expected to be positive and have significant relationship with the dependent variable, indicating effect of marketing cost on selling price.

** Marketing Channel:* Marketing channel was identified using the participants and the route through which processed fish was transferred from producers to consumers and a distribution channel was drawn.

** Market Margin Analysis:* Market margin if not perfect and static is also measure of market performance (Olukosi and Isitor, 1990). This is the ratio that determines the gap between producers and consumers price. It is expressed as:-

$$MM = \frac{SP}{CP} \times 100\%$$

Where, MM = Market Margin, SP = Selling Price and CP = Cost Price

V. Results and discussion

Socio-economic Characteristics of Marketers: The Socio-economic characteristics of marketers which include age, gender, family size and years of experience are presented in Table 1. Data showed that marketers between the ages 31-40 have the highest percentage (46.25%) followed by those above 40 years (28.75%) and between ages 21-30 years (15%). It can be concluded that, most of the marketers are in their economic active years.

The table further reveals that male respondents comprise of (50%) and the same goes for the female. This means that both males and females participate equally in marketing of processed fish. Females are therefore not left out in fish marketing. A similar study in Benue State found about 90% women participation in fish marketing. (Lawal and Idega, 2004). This is further supported by Williams and Awoyemi (1998) who observed that women in small-scale riverine fishing villages also perform other types of income earning activities to supplement the household income, such income sources were earned through sales of fisheries products and social services in fish distribution and marketing.The data illustrated that marketers with family size that range between 1-10 persons have the highest percentage (71.25%) followed by those that have persons ranging between 11-20 (18.75%). This implies that the lower the number of family dependant on marketers the better the market performance because less time is spent on family issues and more on marketing. Only about 3.75% of the respondents have above 20 persons while 6.25% have no dependants in their households.Marketers with experience of about 11-20 years and 21-30 years constituted about 30% and 28.75% of the total respectively. This is substantiated by the findings of Ali *et al.*, (2008) who observed that marketing experience is important in determining the profit levels of marketers, the more the experience, the more marketers understand the marketing system, condition, trends, prices etc. The data illustrated that majority of the marketers had some formal education. 55.0%, 35.0% and 6.25% had primary, secondary and

tertiary education respectively. Only about 3.75% of the respondents have no education at all, implying that literacy level of processed fish marketers in the area was fairly high. This is supported by Dogondaji and Baba (2010) who observed that high literacy level could have positive impact on the adoption of agricultural technologies.

Effect of Marketing Cost on Processed Fish Distributed **:** the effect of marketing cost on processed fish sold was estimated via the multiple regression (Table II). Result revealed that initial capital, cost of fish, processing cost and handling charges were significant at 10%, 5% and 1% levels respectively indicative of positive relationship between selling price and cost prices in all the markets. The positive and significant coefficients show that they are the major determinants of selling prices of processed fish in the area. Packaging costs, produce tax and LGA tax also had positive coefficient, the implication in that these variables also have an effect on the selling price by increasing it. Transportation and storage costs have negative coefficients, this implies that, in the study area, marketers do not pay transport and storage costs, they sell to marketers that come from the regional markets while others buy from wholesales and merchants and sell within the same market. The insignificant co-efficient exhibited by transportation and storage cost could be as a result of two markets being producer markets (Gurin and Laboundo markets). This may be due to the fact that most processors in these markets do not transport nor store their fish but rather sell to marketers that come from Yola metropolis and environs. The marketers here are more or less "fishermen processors" thus, most of them sell their fish to other marketers, therefore, they do not usually store nor transport the commodity. Ali *et al.* (2008) also observed that fish marketers at Alau Dam landing site were more or less fishermen who do not transport or store their products but sell to marketers coming from the environs. They also observed a negative and insignificant coefficient in transportation and storage cost of fish marketers.

Marketing Channel: the participants in the processed fish marketing were identified based on the quantity of fish traded per month (Table III). Results revealed that producer/processors had the highest percentage of 40.1%. The producer/processors were categorised into fishermen processors, female processors and middlemen processors. This was followed by the wholesalers with 36.9%, merchants had 13.8% and the least were the retailers with 9.2%. A distribution channel was also identified. Figure II shows that both wholesalers and consumers buy directly from the producer/processors (that is, fishermen processors, female processors and middlemen processors). The merchants and retailers buy from wholesalers and finally gets to the consumers. This chain reveals that the distribution channel in the area is decentralised. i.e. both consumers and agents (middlemen) buy directly from the producers. A decentralised channel is usually a short chain which reduces the activities of middlemen, thereby reducing exploitation.

Marketing Margin Analysis: Marketing margin depicts the ratio that determines the gap between producer and consumer prices. For this study, the total selling price was N214, 614, 40 while the total cost or purchase price was N129, 213.30. therefore, the market margin was found to be 39.8%. This margin is high, thus it can be concluded that marketers in the study area are making profit.

Problems Associated with Fish Marketing in the Study Area: Major problems confronting processed fish marketers in the area were identified. This is illustrated in fig. I.

Poor access to capital was ranked first with 45%. Which was as a result of inadequate sources of finance and the problem of collateral before obtained loan. Absence of co-operative society was ranked 2nd with 37.5% poor transportation network was ranked 3rd with 10%, this maybe as a result of poor road network linking the rural fish markets to the urban centres. The 4th ranked problem was lack of government assistance in form of tax reduction and subsidy.

VI. Conclusion and Recommendations

Marketing of processed fish is a lucrative business in the study area if well -managed and distributed. There is a need for the formation of a strong co-operative society by marketers so as to ease the problem of capital and loan acquisition from finance institutions. Government should assist marketers by reducing tax and provide licence for more micro-credit finance institutions to provide short term loan to marketers.

Table 1: Socio-Economic Characteristics of Processed Fish Markets

Variables	Number of respondents	Percentage
AGE		
≤21	2	2.5
21-30	12	15
31-40	37	46.25
41-50	13	16.25
51-60	10	12.5
>60	6	7.5
Total	80	100
Gender		
Male	40	50
Female	40	50
Total	80	100
Years of Experience		
≤10	28	35
11-20	24	30
21-30	23	6.25
>30	5	100
Total	80	100
Educational Attainment		
None	3	3.75
Primary	44	55.0
Secondary	28	35.0
Tertiary	5	6.25
Total	80	100
Family Size		

Table 2: Regression Estimates of Processed (Smoked and Dried) Fish Marketers.

Explanatory Variables	Equation Form Exponential	Double Log
Constant Term	2.880	4.428
X1 Initial capital	0.00002812 (1.371)	0.08868 (1.985)**
X2 cost of fish	0.000199 (1.224)	0.0645 (1.727)*
X3 Processing cost	0.0462 (2.759)***	0.315 (6.162)***
X4 Packaging cost	-0.00119 (-1.588)	0.0259 (0.470)
X5 Handling charges	0.00449 (3.795)***	0.159 (2.866)***
X6 Storage cost	0.000405 (2.850)***	-0.00319 (-0.161)
X7Transportation cost	-0.000103 (-0.824)	-0.0120 (-0.251)
X8 Produce tax	-0.000449 (-0.997)	0.000418 (0,018)
X9 Market union tax	0.000228 (0.310)	-0.00553 (-0.200)
X10 L.G.A. tax	0.000347 (0.920)	0.157 (2.752)
R^{-2}(%)	58.7	63.8
F- value	7.23***	8.93***
S- error	0.41495	0.38889

*** Significant at 1 % level; ** Significant at 5 % level; * Significant at 10 % level

Table 3: Quantity of Processed Fish Distributed/Kg/Month

Categories	Quantity of Fish Traded	Percentage
Producers/Processors	4,350	40.1
Wholesales	4000	36.9
Merchants	1,500	13.8
Retailers	1000	9.2
Total	10,850	100

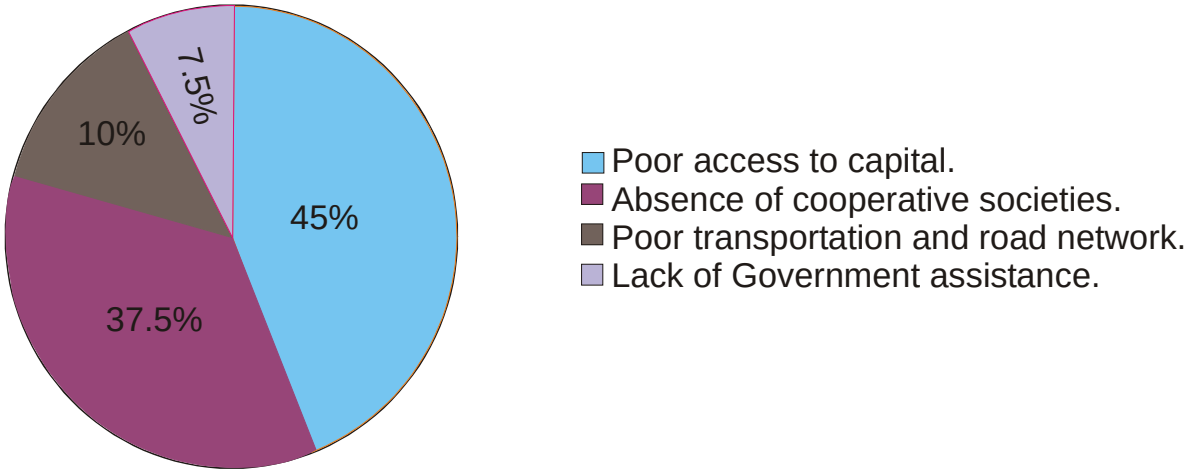

Fig. 1: Problems Associated with Processed Fish Marketing in the Study Area

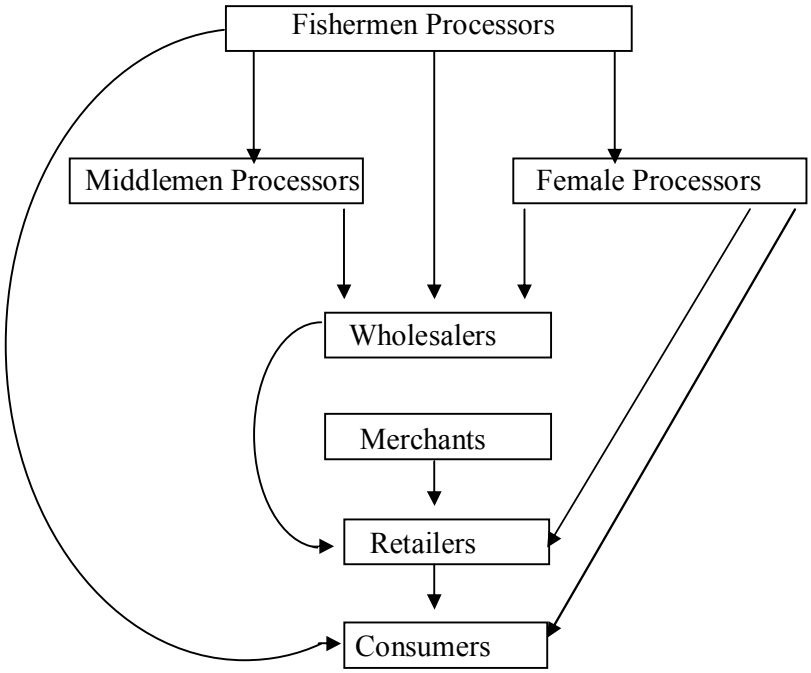

Fig 2: Processed fish distribution channel in the study area

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