Research Article
Assessment of the Marketing of Frozen Fish (Iced Fish) in Edo State, Nigeria

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Abstract: The study examines the marketing of frozen fish in Edo State of Nigeria. The primary data used for the study were derived using structured questionnaires administered to 180 randomly selected frozen fish marketers from six markets. Both descriptive and inferential statistics were used in data analysis. From the findings, marketing of fish is mainly carried out by females, most of the respondents are in the economically active age group and are mostly married; they have a lot of experience in the business, majority of them are retailers selling less than four cartons of fish on daily basis and most of them have formal education. From the gross margin analysis and t-test, marketing of frozen fish is profitable in the area. However, it was recommended that major constraints like poor storage/preservation, inadequate capital and marketing costs should be tackled to improve the efficiency of marketing system of frozen fish in the State.

Keywords: Assessment, constraints, Edo state, frozen fish, marketing costs

INTRODUCTION

In Nigeria, poverty is severe especially among agrarian households (FOS 1998, 1999. Recent estimate showed that at least 41% of Nigeria population is food insecure with 16% being undernourished (Olayemi, 1996; Okumadewa, 2001). Most Nigerians are unable to meet their protein requirement mainly because of their poverty level. The needed protein for growth especially among children has been in short supply. Animal protein sources such as beef, mutton and chicken are beyond the reach of an average income earner. Therefore the average income earner need to supplement or substitute his protein requirement with fish protein which is equally nutritious but cheaper than animal protein (Samson, 1997).

Fish is one of the best sources of protein food because of its balanced amino acids configuration, digestibility and low cholesterol level. To this end, the demand for fish has been on the increase. Hence, in 1981, 384000 tons of fish were consumed in Nigeria out of which 296000 tons were produced locally and the balance imported (FAO, 1989). Fish also contribute 6-8% of agricultural sector total contribution to GDP (FAO, 1989). By this, the fishery subsector provides employment opportunities to many Nigerians including those involved in direct fish processing and marketing.

It is important to evaluate marketing systems of fish because they indicate how the various market participants are organized to accomplish the movement of the commodity from the producer to the ultimate consumer (Olukosi et al., 2007). Marketing of fish is not usually on the basis of fisherman to consumer (Lawal and Idega, 2004). There are several middlemen in the link between producers (fishermen) and consumers (Adegeye and Dittoh, 1985). Therefore price of fish changes as it passes through middlemen such that by the time it reaches the final consumer, it has increased considerably. Since proper marketing of fish ensures that fish is made available to all and sundry, it therefore becomes imperative that assessment of fish marketing be carried out to determine the viability and effectiveness of marketing system of fish. Marketing of fish could be regarded as the performance of all business activities involved in the flow of fish from the point of production (fisherman or fish farmer) to the final consumer (Akanni and Akinleye, 2004; Olukosi et al., 2007; Kow and Downey, 1972).

Efficient marketing system is significant in a country under all condition and at all stage of its development (Chikwenwu and Amos, 1998; Alabi et al., 2006). Effective marketing system will locate where there are surpluses of produce and bring them to where there are shortages (Chikwenwu and Amos, 1998). The questions that arise are: what are the socio-economic features of marketers? Has the quantity been adequately marketed to all sundry that need fish? What is the channel of distribution of fish to the consumer and how effective is the marketing of fish? Did marketers of fish incur any losses or gain from the products marketed? Are there constrains militating against efficient marketing of fish? It is with the premise of this study to investigate these issues.

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The broad objective of the study is the assessment of fish marketing in Edo state. The specific objectives are to:

- Describe the socio-economic characteristics of fish marketers
- Determine the volume of fish traded in the area
- Determine marketing channels of fish distribution
- Determine the gross margin and profitability in the marketing of fish
- Determine the major constraints of fish marketers. The study tested the following hypothesis: the profit of frozen fish marketers is equal to zero

RESEARCH METHODOLOGY

The study was conducted in Edo state of Nigeria. Edo state was created on August 27, 1991. Until then Edo State with Delta State formed what was formerly Bendel State. The population of the entire state is approximately four million (National Population Commission, 2006). Edo State has a land mass of 19,749 square kilometers, lying on 05° 44' N and 07° 34' N latitudes and 05° 4' E and 06° longitudes. Edo State is low lying except towards the North axis where the Northern and Esan plateaus range from 183 meters of the Kukuruku hills to 672 meters of the Somorika hills. Edo state is so located that it forms the nucleus of the Niger Delta region. It is bordered by Kogi state to the North and Delta State to the East and South, Ekiti and Ondo states to the west. The state comprises of 18 local government areas the climate is typically with two distinct seasons-the wet (rainy) and the dry seasons. The wet season lasts from April to November and the dry season December to March. Apart from direct agricultural production, marketing activities (including fish marketing) are well established in the state.

The population of the study comprises of all frozen fish marketers in Edo State of Nigeria. Edo state was purposively selected because there are numerous frozen fish marketers distributed all over the state.

A multi-stage sampling procedure was used in selecting the respondents for the study.

Stage 1: Out of the three agro-ecological zones in Edo State, two local government areas were randomly selected from each zone. The agricultural zones in Edo State are Edo North, Edo Central and Edo South.

Stage 2: Three markets were randomly selected from the list of markets known for selling frozen fish in each local government area.

Stage 3: Twenty frozen fish marketers were then randomly selected from each of the nine chosen markets, thus giving a total respondents of one hundred and eighty (180) which data were collected from for the study.

Both descriptive and inferential statistical were used in the analysis of data. Descriptive statistics include frequency distribution tables and simple percentage. Percentage were use to describe the socio-economic variables, flow chart was use for marketing channels and frequency distribution was use for constrains of marketing fish.

The monetary value of fish traded was achieved using the formula:

$$\text{Monetary value of fish} = Q\,(P_Q)$$

where,
Q = Quantity traded
P_Q = Average unit price of the product

The marketing channels of fish distributed will be achieved using flow chart.
Gross margin was use to measure the profit or losses of fish marketers.

$$GM = GR\text{-}TVC$$

where,
GM = Gross Margin in Naira per Kilogram of Fish
GR = Gross Revenue in Naira
TVC = Total Variables Cost in Naira

The five point likert-scale with values; 1 = not very serious; 2 = not serious; 3 = I don't know; 4 = serious and 5 = very serious was used to assess the magnitude of constraints faced by fish traders. The cut-off point was 3, that is, above 3 was regarded as a serious constraint, and while below 3 was regarded as not serious.

The following hypothesis was tested: the profit of marketers is not significantly different from zero. The formula of the t-test is expressed as:

$$t-ratio = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2} - 2r\frac{(S_1).(S_2)}{\sqrt{N_1}\sqrt{N_2}}}}$$

where,
$\bar{X}_1$ = Mean of Revenue
$\bar{X}_2$ = Mean of Cost
S_1 = Standard Deviation of Revenue
S_2 = Standard Deviation of Cost
N_1 = Number of Respondent Deriving Revenue
N_2 = Number of Respondents Incurring Cost

RESULTS AND DISCUSSION

Socio-economic characteristics of fish marketers: Table 1 shows the socio-economic characteristics of the frozen fish marketers.

Gender: As shown in Table 1, 70% of respondents were females, while the remaining 30 percent were male. The result confirms observation by Lawal and Idega (2004) that in Benue State 90% females are involved in fish marketing. Similarly, Gaya *et al.* (2006) observed that the frozen fish market is a female

Table 1: Socio-economic characteristics of respondents

Variable	Frequency	Percentage
Gender		
Male	54	30
Female	126	70
Sub-Total	180	100
Age		
Less than 30 years	18	10.0
30-39 years	63	35.0
40-49 years	72	40.0
50-59 years	27	15.0
60 years-above	0	0
Subtotal	180	100
Marital status		
Never married	36	20
Married	135	70
Separated	6	3.33
Divorce	3	1.67
Subtotal	180	100
Trading experience		
Less than 5 years	6	3.335
5-10 years	6	3.335
More than 10 years	168	93.33
Subtotal	180	100
Scale of operation		
Wholesalers	6	3.3
Retailers	174	96.7
Subtotal	180	100
Household size		
Small (2-4)	90	50
Medium (5-7)	72	40
Large (8-above)	18	20
Subtotal	180	100
Educational qualification		
No – Formal	21	12.33
Tertiary	27	15
Secondary school	54	30
Primary school	78	41.67
Subtotal	180	100

Field survey, 2011

Table 2: Quantity of fish sold on daily basis

Average quantity (carton)	Frequency	Percentage
1-3	162	90
4- 6	15	8.3
Above 6	3	1.7
Total	180	100

Field survey, 2011

Table 3: Gross margin analysis of fish traders

Variables	Estimated value in naira per day
Purchasing cost	6,050.4
Preservation/storage costs	421.4
Marketing cost	227.7
Commission to Agents	120
Total cost	6,819.5
Total revenue obtained	7,718.7
Net income	899.2

Field survey, 2011

Household size: Fifty percent have small household size of between 2-4 members, 40% have medium household size of between 5-7 while only ten percent of the respondents have large family size of 8 and above. Banmeke (2003) asserted that family size is an important index in any rural development intervention which can affect the outcome of such intervention.

Quantity and value of fish traded:
Quantity of fish sold on daily basis by respondents: In Table 2 the result showed that 90% of fish retailers sold 1-3 cartons of fish daily, 8.3% sold 4-6 cartons daily while only 1.7% sold above 6 cartons daily. A carton weighs about 25 kg.

Gross margin of fish marketers: Table 3 indicates the gross margin of fish marketers. The result shows that the business of fish marketing is profitable. Each marketer was able to make an average profit of about ₦900 after deducting total variable costs from the total revenue. In the analysis, it was assumed that fixed cost was zero and therefore not included.

Marketing channels for fish: The major Channels for fish distribution in the area are shown in Fig. 1. The longer the marketing channel the greater the marketing cost. Thus a wise trader will want to purchase his fish in such a way that will reduce marketing cost.

Profit level of fish marketing: Data generated from the aspect of cost of marketing and revenue was analyzed by means of t-test. (To show the significant of profit level), the formula is stated:

$$t - ratio = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2} - 2r\frac{(S_1).(S_2)}{\sqrt{N_1}\sqrt{N_2}}}}$$

where,
$\overline{X}_1$ = Mean of Revenue
$\overline{X}_2$ = Mean of Cost

dominated market. It is observed that retailers often stick only to fish trading as source of income; this may be due to the nature of their gradual sales per time period which calls for all times business.

Age: Age of marketers ranges from below 30-60 years. Table 1 also shows that 40.0% of respondents fall between the age group 40-49 years. The findings are in agreement with Gaya *et al*. (2006) who observed that those involved in economic activities like fish marketers are in their economic active age.

Marital status: Dikito-Watchmeiser (2001) opined that marital Status is an important factor in social rural participation and acceptance. Seventy five percent were married. The implication of the finding is that marriage remains a valued culture in the study area. Oladoja *et al*. (2008) contended that marriage is an important factor in the livelihood of individuals in our society as it is perceived to confer responsibility on individuals.

Scale of operation of traders: As shown in Table 1. The fish trader are predominantly retailers with just only six of them (3.3%) being wholesalers.
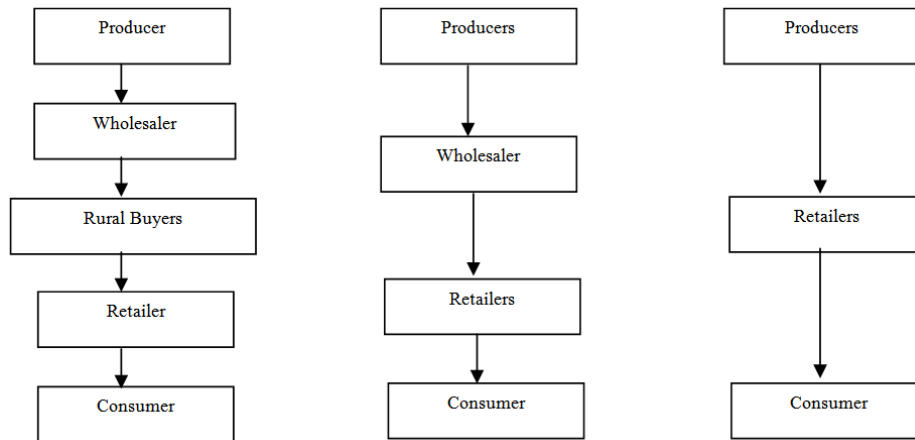
Fig. 1: Marketing channels for fish; Field survey, 2011

S_1 = Standard Deviation of Revenue
S_2 = Standard Deviation of Cost
N_1 = Number of Respondent Deriving Revenue
N_2 = Number of Respondents Incurring Cos
$\overline{X_1}$ = 7,718.7, X_2 = 6,819.5, r = 0.56
S_1 = 450.5, S_2 = 320.3, N_1 = 180$_1$ N_2 = 180

$$t - ratio = \frac{7,718.7 - 6,819.5}{\sqrt{\frac{450.5}{180} + \frac{320.3}{180} - 2(0.56)\frac{[450.5].[320.3]}{\sqrt{180}\ \sqrt{180}}}}$$

Therefore t-ratio = 9.14
Degree of freedom N-1 = 180-1 = 179
At a significant level of 5% (0.05)
Table critical t-ratio is 2.021
    This shows that the net profit in marketing of fish is significantly greater than zero.
    t = 9.14, p<0.05 that is the obtained t-ratio of 9.14 is statistically significant.
    Therefore fish marketing is profitable to fish sellers in the area.
    The major constraints to fish marketing in the area, are lack of storage/preservation facilities (mean = 4.82), Inadequate Capital (mean = 4.75) and marketing costs (mean = 4.71). Poor patronage is not a problem in the area as there is very high demand for fish in the area. (Table 4).

CONCLUSION

    The study was aimed at the assessment of fish marketing in Ughelli North Local Government Area of Delta State. The findings showed that majority of sellers are retailers and falls within the active age; both retailers and wholesalers had female higher percentage.
    The results showed that female with age range of 40-49 years are mainly involved in fish marketing and are mostly married. Most of them were literate with at least primary school leaving certificate. The study

Table 4: Constraints of fish marketing

Problem	Mean	Rank
Lack of storage facility	4.82	1
Inadequate capital	4.75	2
Marketing costs	4.71	3
Poor patronage	1.67	4

Likert-scale: 1 = strongly disagree; 2 = disagree; 3 = undecided; 4 = agree; 5 = strongly agree; Field survey, 2009

further revealed that many fish sellers face constraints like poor storage/preservation, inadequate capital and poor transportation. Marketing of fish is a profitable enterprise.

RECOMMENDATIONS

    Improving the marketing system of fish would involve solution to constraints afore mentioned.
    Therefore the following recommendations were suggested:

• The marketers should be provided with improved storage/preservation facilities to avoid the deterioration of their fish
• Fish marketers or traders should be given financial assistance. To this end micro finance institutions should be encourage to lend more to fish marketers in order to expand their business.
• Fish marketers should be encouraged to form associations so that they can purchase in bulk and thereby reduce costs
• Government should assist the traders in order to reduce their marketing costs. For instance, road construction and provision of electricity on a regular basis could reduce transportation and storage costs

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