COST BENEFIT OF FRESH FISH MARKETING WITHIN ABAKIALIKI METROPOLIS

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ABSTRACT: *The study analyzed the cost benefits of fresh fish marketing within Abakaliki metropolis, the objectives of the study were to determine the costs and returns of fresh fish marketing in the study area, as well as identify the factors affecting the quality and quantity of fish marketed in the study area. Oral interview schedule was used to collect data from seventy (70) respondents who were randomly selected. The data were analyzed using appropriate statistical tools. Objective (1) was analyzed using gross margin model, while objective (2), was analyzed using mean score in the form of a five-point Likert scale model. The result obtained from the gross margin analysis showed that a profit (π) of (₦ 110,280) was made by fish sellers from selling fresh sardine (Sardinella aurita) given a TFC of ₦ 1,500, TVC of ₦ 3,165,720, TR of ₦ 3,276,000, and a GM of ₦ 110,130. The mean score analysis in the form of a five-point likert scale showed that the most accepted factors that affect the quality and quantity of fresh fish sold include; financial problem (3.8) and consumer's choice (3.7). In conclusion, it has been observed that fish marketing in Abakaliki urban is a lucrative venture although, fish is marketed in different forms either as fresh, smoked or dried fish. Marketers have lots of challenges, which the researcher has tried to proffer solutions to as attested by the majority of the respondents. Based on the research findings, the following policy recommendations were therefore proffered. Government should subsidize the price of fish to enable fresh fish sellers purchase at cheaper rate, as well there should be adequate provision of cold rooms to reduce the losses by fish sellers.*

KEYWORDS: Cost Benefit, Fresh Fish Marketing, Abakialiki Metropolis

INTRODUCTION

It is obvious that many of the world's fisheries are challenged by a combination of overexploitation, habitat damage and poor economic returns. For the first time ever it appears the world's total harvest of fish from wild stocks is in decline because of over fishing (Hilborn *et al;* 2003). In an attempt to address these difficulties managers are looking for innovative ways to address the tragedy of the commons' whereby individuals operating in their own self-interest over exploit a common- pool resource which is open to all (Hardin 1968). At the forefront of 'new' thinking about fisheries is the so-called ecosystem approach (Pikitch *et al;* 2004) that places a much greater weight on integrating management across fisheries and maintaining healthy ecosystems (habitats, biodiversity, resilience to shocks etc). While an integrated approach to fisheries is helpful, new approaches are most certainly required to prevent further declines (Pauly *et al;* 2002). Without careful attention by regulators to fisher's incentives little will be accomplished. Marketing is a process of exchanging goods and services from one person to another

with reference to price. A fish market is a market place used for marketing of fish and fish products. However, fish marketing essentially consists of all the activities involved in delivering fish from the producer to the consumer, while distribution provides channels that link the marketing institutions and producers together. Fish marketing may be broadly defined as all those functions involved from the point of catching of fish, to the point of final consumption. As the fish, like any other production moves closer and closer to the ultimate consumer, the selling price increases since the margins of the various intermediaries and functionaries are added to it. The price efficiency is concerned with improving the operation of buying, selling and other connected aspects of marketing process so that it will remain responsive to consumer direction (Ali *et al,* 2008).

Marketing plays an important role in a market economy. The role of marketing as an incentive to fish production and productivity cannot be over emphasized. The marketing of agricultural commodities in Nigeria involves various markets or exchange points. The number of exchange points depends on the nature of the point of production and that of consumption. If the marketing process is efficient, it will go a long way in providing sufficient food to the populace through the process of market mechanism.

Furthermore, due to the cumbersome nature of fish distribution channel, the local fish seller is faced with the problem of profit maximization. Thus, the result is that activities in this sector are mainly dominated by private sector presence with little or no mobilization from the government.

Therefore, any attempt used at improving a country's marketing system has to start with a correct analysis of the problem.

- What are the socio-economic characteristics of different fish marketers in the study area?
- What are the costs and returns of fish marketing in the study area?
- What are the constraints of fish marketing in the study area?
- What are the various species of fish available in the markets and necessary recommendation?

Objectives of the Study
The broad objective of the study is to determine the economics of fish marketing in Abakaliki, Ebonyi state. The specific objectives are to:
- Determine the cost and returns of fresh fish marketing in the study area.
- Identify the factors affecting the quality and quantity of fresh fish marketed in the study area.

Justification for the Study
It is aimed that this study will proved the relevant data required for improving fresh fish marketing in Abakaliki market; such as poor socio-economics environment like access road, developed market, school for children etc, poor storage facilities and fish spoilage, effect on cost-returns of fish marketers, constraints of fish marketing such as transportation, Epileptic power supply in the cold room, cost of fish, financial and processing problems. Therefore, this research will serve as a

secondary data to other researchers who may be interested in carrying out research in the same or related topic.

METHODOLOGY

Study Area
Abakaliki urban, Ebonyi state is the study area. It consists of two local government areas, Abakaliki and Ebonyi local government area. Abakaliki urban is the capital of Ebonyi state, the area is bounded in the east by Izzi local government area in the West by Ezza North and Ezza South local government areas and in the South by Cross River/Benue State. Abakaliki lies between longitude 7.30^{o} and 8.30^{o} East and latitudes 5.40^{o} and 6.45^{o} North. The main occupation of the people is farming.

Geopolitically, Abakaliki urban belongs to the south-east zone but lies entirely in the cross river plains (EBSEEDS, 2006). Ebonyi State population based on the 1991 population census was estimated at1,523,000 people, which is about 2% of Nigeria's total population of 88,992,220 people in 1991 (NPC,2006). About 60% of the total population of Ebonyi State is made up of rural dwellers, while the urban population is estimated at about 40%. Abakaliki urban has many markets where fish are sold, it include; Abakpa market, Ekeaba market, Nkwegu market, Kpirikpiri market, Nwokpo market, Rice mill market, Ishieke market and other markets within the Abakaliki municipality.

Sampling Techniques
Multi-stage sampling technique was employed in sampling the respondents for the study. It is a sampling method in which the population is divided into a number of groups or primary stages from which samples are drawn; these are then divided into groups or secondary stages from which samples are drawn, and so on. The sampling was based on the number of the contact fish sellers within Abakaliki urban in Ebonyi state.

Stage 1.
Seven major markets noted for fish markets within Abakaliki urban were   selected by purposive sampling techniques.

Stage 2.
Contact fish sellers in the selected market were identified and ten (10)
Fish sellers from each market were randomly selected. A sample size of seventy (70) respondents were selected and interviewed.

Data Collection
Primary data collection procedure was used for the study; the primary data was collected by the use of oral interview technique. The oral interviews technique was adopted because most of the fish sellers have low level of education and some did not attend school.The following questions were asked and answered, the name of the market, sex, marital status, age, educational qualification, household size, annual income, nature of the occupation, years of experience, types of fish sales, source of fund, source of fish, amount used to buy a carton of fish, amount realized from a carton of fish, amount for a fish, number of a carton sell per day, expense made for a day,

forms of fish sales, which of them are more costly, overturn of one of carton of fish, factors affecting the fish sold.

Analytical Techniques

A number of analytical tools were employed in data analysis. Objective (1) was analyzed using gross margin model, while objective (2), was analyzed using mean score in the form of a five-point Likert scales model.

MODEL SPECIFICATION

Gross Margin Model

This model was used to determine the costs and returns from gross margin obtained; further analysis was done to obtain profitability of fish marketers in the study area. Matta (2004)

GM=TR-TVC

Where

Gm = Gross margin

TR = Total revenue

TVC = Total variable cost

π = GM- TFC

Where

π = profit

GM = Gross margin

TFC = Total fixed cost.

Mean score model

Mean score was adopted to analyze objective (2).

Five- point likert scales (Dawes & John, 2008) was used in which the decision rule is 3.0

Likert formular

Decision point < 3.0 Reject

>3.0 Accept

Decision rule. X = $\overline{\Sigma}$ ^{x}/n = 5+4+3+2+1 = ^{15}/5 = 3.0

Where x $\equiv$ mean

Σ = summation

X = value likert

N = number of items

RESULTS AND DISCUSSION

The Result of the Cost and Returns Analysis of the Survey are Presented in Tables 3-16

The Gross margin for scomber (*Scomber japonctatus*)

Table 3: The result of the analysis of gross margin for fresh Scomber (*Scomber japonctatus*) is presented below.

1. Variable Cost	Amount
Cost of fish	2,310,000
Transportation	10,920
Rent	18,000
Miscellaneous	36,400
Total variable cost (TVC)	**2,375,320**
2. Gross revenue	
Revenue from fish selling	6,006,000
Total revenue (TR)	**6,006,000**
3. Fixed Cost	
Knife	1,500
Total fixed cost (TFC)	**1,500**

Source: Field survey, 2014.

The result from Table 3, shows that variable cost were computed as follows: cost of fish (₦2,310,000) transportation (₦10,920), rent (₦18,000), miscellaneous (₦36,400) and this gives total variable cost (TVC) of (₦2,375,320). The result shows also that gross revenue was computed as revenue from fish selling, which gives a total revenue (TR) of (₦6,0006,000) and result from fixed cost were computed as cost of knife (₦1,500), and this gives a total fixed cost (TFC) of (₦1,500). From the above result, gross margin (GM) was computed as follows: total revenue (TR) (₦6,006,000) minus total variable cost (TVC) (₦2,375,320) which gives (₦3,630,680). But profit (π) was computed thus; gross margin (GM) (3,630,680) minus total fixed cost (TFC) (1,500) which gives (3,629,180). Therefore, the result obtained from table 3 shows that, the net profit (π) for selling of fresh scomber (*Scomber japonctatus*) gives ₦3,629,180.

The Gross Margin for fresh Mackerel (*Trachurus Japonicus*)

Table 4: The result of the analysis of gross margin for fresh macherel (*Trachurus japonicus*) is presented below.

1. Variable Cost	Amount
Cost of fish	3,458,000
Transportation	10,920
Rent	18,000
Miscellaneous	36,400
Total variable cost (TVC)	**3,523,320**
2. Gross revenue	
Revenue from fish selling	4,140,500
Total revenue (TV)	**4,140,500**
3. Fixed cost	
Knife	1,500
Total fixed cost (TFC)	**1,500**

Source: Field survey, 2014.

The result obtained from Table 4, shows that variable costs were computed as follows: cost of fish (₦3,458,000), transportation (₦10,920), rent (₦18,000), miscellaneous (₦36,400) and this gives a total variable cost (TVC) of (₦3,523,320). The result shows also that gross revenue were computed as revenue from fish selling (₦4,140,500) and this gives a total revenue (TR) of (₦4,140,500). And result from the Table 4 shows that fixed cost were computed as cost of knife (₦1,500) which gives a total fixed cost (TFC) of (₦1,500).

The result obtained from the total variable cost (TVC) and total revenue (TR) were used to compute gross margin (GM) as: total revenue (TR) (₦4,140,500) minus total variable cost (TVC) (₦3,523,320) which gives (₦617,180). But profit (π) were computed thus: gross margin (GM) (₦617,180) minus total fixed cost (TFC) (₦1,500) which gives (₦615,680).Therefore, result obtained from Table 4, shows that, the net profit (π) for selling of mackerel (*Trachurus japonicus*) gives (₦615,680).

The Gross Margin Fresh Sardine (*Sardinella aurita*)
Table 5: The results of the analysis of gross margin for fresh sardine (*Sardinella aurita*) is presented below.

1. Variable Cost	Amount
Cost of fish	3,130,400
Transportation	10,920
Rent	18,000
Miscellaneous	36,400
Total variable cost (TVC)	**3,165,720**
2. Gross revenue	
Revenue from fish selling	3,276,000
Total revenue (TR)	**3,276,000**
3. Fixed cost	
Knife	1,500
Total fixed cost (TFC)	**1,500**

Source: Field survey, 2014.

The result obtained from Table 5, shows that variable costs were computed as follows: cost of fish (₦3,130,400), transportation (₦10,920), rent (₦18,000), miscellaneous (₦36,400) and this gives a total variable cost (TVC) of (₦3,165,720). The result also shows that gross revenue were computed as revenue from fish selling (₦3,276,000) and this gives a total revenue (TR) of (₦3,276,000). And result from the above table shows that fixed cost were computed as cost of knife (₦1,500) which gives a total fixed cost (TFC) of (₦1,500). The result obtained from the total variable cost (TVC) and total revenue (TR) were used to compute gross margin (GM) as: total revenue (TR) (₦3,276,000) minus total variable cost (TVC) (₦3,165,720) which gives (₦110,280). But profit (π) was computed thus; gross margin (GM) (₦110, 280) minus (₦110, 130). Therefore, the result obtained from Table 3 shows that, the net profit (π) for selling of fresh sardine (*Sardinella aurita*) gives ₦110,130.

The Gross Margin for Fresh Spotted

Table 6: The result of the analysis of gross margin for fresh spotted is presented below:

1. Variable Cost	Amount
Cost of fish	4,732,000
Transportation	10,920
Rent	18,000
Miscellaneous	36,400
Total variable cost (TVC)	**4,797,320**
2. Gross revenue	
Revenue from fish selling	5,460,000
Total revenue (TR)	**5,460,000**
3. Fixed cost	
Knife	1,500
Total fixed cost (TFC)	**1,500**

Source: Field survey, 2014.

The result obtained from Table 6, shows that variable cost were computed as follows: cost of fish (₦4, 732,000), transportation (₦10,920), rent (₦18,000), miscellaneous (₦36,400) and this gives a total variable cost (TVC) of (4,797,320). The result shows also that gross revenue were computed as revenue from fish sales (₦5,460,000) and this gives a total revenue (TR) of (₦5,460,000). And result from the table 6, shows that fixed cost were computed as cost of knife (₦1,500) which gives a total fixed cost (TFC) of (₦1,500). From the results above, gross margin (GM) were computed as follows: total revenue (TR) (₦5, 460,000) minus total variable cost (TVC) (₦4, 797,320) which gives (₦662,680). But profit (π) were computed as gross margin (GM) (₦662, 680) minus total fixed cost (TFC) (₦1,500) which gives (₦662,180). Therefore, the result obtained from table 6, shows that, the net profit (π) for selling of fresh spotted fish gives (₦662,180).

4.1.5. The Gross Margin for Smoked Scomber (*Scomber japonctatus*)

Table 7: The result of the analysis of gross margin for smoked scomber (*Scomber japonctatus*) is presented below.

1. Variable Cost	Amount
Cost of fish	2,310,000
Transportation	18,200
Rent	18,000
Firewood	36,400
Miscellaneous	72,800
Total variable cost (TVC)	**2,455,400**
2. Gross revenue	
Revenue from fish selling	6,552,000
Total revenue (TR)	**6,552,000**
3. Fixed cost	
Cost of smoking kiln	1,500
Knife	1,500
Total fixed cost (TFC)	**3,000**

Source: Field survey, 2014.

The results from Table 7, shows that variable costs were computed as follows: cost of fish (₦2,310,000), transportation (₦18,200), rent (₦18,000), firewood (₦36,400), miscellaneous (72,800) and this gives a total variable cost (TVC) of (₦2,455,400). The result also shows that gross revenue were computed as revenue from fish sales (₦6,552,000) and this gives a total revenue (TR) of (6,552,000). And result from table 7 shows that fixed cost was computed as follows: Cost of smoking kiln (1,500), cost of knife (1,500) which gives a total fixed cost (TFC) of (3,000). From the above result, gross margin (GM) were computed as follows: total revenue (TR) (₦6,552,000) minus total variable cost (TVC) (₦2,455,400) which gives (₦4,096,600). But profit (π) were computed as follows: gross margin (GM) (₦4,096,600) minus total fixed cost (TFC) (₦3,000) which gives (₦4,093,600). Therefore, the result obtained from table 7, shows that, the net profit (π) for selling of smoked scomber (*Scomber japonctatus*) gives (₦4,093,600).

The Gross Margin for Smoked mackerel (*Trachurus japonicus*)
Table 8: The result of the analysis of gross margin for smoked mackerel (*Trachurus japonicus*) is presented below.

1. Variable Cost	Amount
Cost of fish	3,458,000
Transportation	18,200
Rent	18,000
Firewood	36,400
Miscellaneous	72,800
Total variable cost (TVC)	**3,603,400**
2. Gross revenue	
Revenue from the fish selling	4,459,000
Total revenue (TR)	**4,459,000**
3. Fixed cost	
Cost of smoking kiln	1,500
Cost of knife	1,500
Total fixed cost (TFC)	**3,000**

Source: Field survey, 2014.

The result from table 8, shows that variable costs were computed as follows: cost of fish (₦3,458,000), transportation (₦18,200), rent (₦18,000), firewood (₦36,400), miscellaneous (₦72,800) and this gives a total variable cost (TVC) of (₦3,603,400). The result also shows that gross revenue were computed as revenue from fish sales (₦4,459,000). And result from the table 8 shows that fixed cost were computed as follows: cost of smoked kiln (₦1,500), cost of knife (₦1,500) which gives a total fixed cost (TFC) of (₦3,000). From the above results, gross margin (GM) were computed as follows: total revenue (TR) (₦4,459,000) minus total variable cost (TVC) (₦3,603,400) which gives (₦855,600). But profit (π) were computed as follows: gross margin (GM) (₦855,600) minus total fixed cost (TFC) (₦3,000) which gives (₦852,600). Therefore, the result obtained from table 7 shows that, the net profit (π) for sales of smoked mackerel (*Tranchurus japonicus*) gives (₦852,600).

The Gross Margin for Smoked Sardine (*Sardinella aurita*)

Table 9: The result of the analysis of gross margin for smoked sardine (*Sardinella aurita*) is presented below.

1. Variable Cost	Amount
Cost of fish	3,130,400
Transportation	18,200
Rent	18,000
Firewood	36,400
Miscellaneous	72,800
Total variable cost (TVC)	**3,275,800**
2. gross revenue	
Revenues from fish selling	3,931,200
Total revenue (TR)	**3,931,200**
3. Fixed cost	
Cost of smoking kiln	1,500
Knife	1,500
Total fixed cost (TFC)	**3,000**

Source: Field survey, 2014.

The result from the table 9 shows that variable costs were computed as follows: cost of fish (₦3,130,400), transportation (₦18,200), rent (₦18,000), firewood (₦36,400), miscellaneous (₦72,800) and this gives a total variable cost (TVC) of (₦3,275,800). The result also shows that gross revenue were computed as revenue from fish sales (₦3,931,200) which gives a total revenue (TR) of (₦3,931,200) and result from the table 7 shows that fixed cost were computed as follows: cost of smoked kiln (₦1,500), cost of knife (₦1,500) which gives a total fixed cost (TFC) of (₦3,000). From the above result, gross margin (GM) were computed as follows: total revenue (TR) (₦3,931,200) minus total variable cost (TVC) (₦3,275,800) which gives (₦655,400). But profit (π) were computed as follows: gross margin (GM) (₦655,400) minus total fixed cost (TFC) (₦3,000) which gives (₦652,400). Therefore, the result obtained from table 9 shows that, the net profit (π) for sales of smoked sardine (*Sardinella aurita*) gives (₦652,400).

The Gross Margin for Smoked Spotted

Table 10: The result of the analysis of gross margin for smoked spotted is presented below.

1. Variable Cost	Amount
Cost of fish	4,732,000
Transportation	18,200
Rent	18,000
Firewood	36,400
Miscellaneous	72,800
Total variable cost (TVC)	**4,877,400**
2. Gross revenue	
Revenue from fish selling	5,824,000
Total revenue (TR)	**5,824,000**
3. Fixed cost	
Cost of smoking kiln	1,500
Knife	1,500
Total fixed cost (TFC)	**3,000**

Source: Field survey, 2014.

The result from the Table 10 shows that variable costs were computed as follows: cost of fish (₦4,732,000), transportation (₦18,200), rent (₦18,000), firewood (₦36,400), miscellaneous (₦72,800) and this gives a total variable cost (TVC) of (₦4,877,400). The result shows also that gross revenue were computed as revenue from fish sales (₦5,824,000) and this gives a total revenue (TR) of (₦5,824,000). And result from the table 10 shows that fixed cost were computed as follows: cost of smoking kiln (₦1,500), cost of knife (₦1,500) which gives a total fixed cost (TFC) (₦3,000). From the above result, gross margin (GM) were computed as follows: total revenue (TR) (₦5,824,000) minus total variable cost (TVC) (₦4,877,400) which gives (₦946,600). But profit (π) were computed as follows: gross margin (GM) (₦946,600) minus total fixed cost (TFC) (₦3,000) gives (₦943,600). Therefore, the result obtained from table 10 shows that, the net profit (π) for sales of smoked spotted fish gives (₦943,600).

The Gross Margin for Dried catfish (*Clarias gariepinus*)
Table 11: The result of the analysis of gross margin for dried catfish (*Claria gariepinus*) is presented below.

1. Variable Cost	Amount
Cost of fish	2,652,000
Transportation	46,800
Rent	20,400
Miscellaneous	31,200
Total variable cost (TVC)	**2,750,400**
2. Gross revenue	
Revenue from fish selling	2,886,000
Total revenue (TR)	**2,886,000**
3. Fixed cost	
Bags	1,800
Table	1,200
Total fixed cost (TFC)	**2,000**

Source: Field survey, 2014.

The results from the table 11 shows that, variable costs were computed as follows: cost of fish (₦2,652,000), transportation (₦46,800), rent (₦20,400), miscellaneous (₦31,200) and this gives a total variable cost (TVC) of (₦2,750,400). The result shows also that gross revenue were computed as revenue from fish sales (₦2,886,000) and this gives a total revenue (TR) of (₦2,886,000). And results from the table 11 shows that fixed cost were computed as follows: cost of bags (₦1,800), cost of table (₦1,200) which gives a total fixed cost (TFC) of (₦2,000). From the above result, gross margin (GM) were computed as follows: total revenue (TR) (₦2,886,000) minus total variable cost (TVC) (₦2,750,400) gives (₦135,600). But profit (π) were computed as follows: gross margin (GM) (₦135,600) minus total fixed cost (TFC) (₦2,000) gives (₦133,600). Therefore, the result obtained from table 11 shows that, the net profit (π) for sales of dried catfish (*Clarias gariepinus*) give (₦133,600).

The Gross Margin for Dried Electric fish (*Malapterurus electricus*)

Table 12: The result of the analysis of gross margin for dried electric fish (*Malapterurus electricus*) is presented below.

1. Variable Cost	Amount
Cost of fish	14,820,000
Transportation	46,800
Rent	20,400
Miscellaneous	31,200
Total variable cost (TVC)	**14,918,400**
2. Gross revenue	
Revenue from fish selling	18,720,000
Total revenue (TR)	**18,720,000**
3. Fixed cost	
Cost bags	2,500
Table	3,000
Total fixed cost (TFC)	**5,500**

Source: Field survey, 2014.

The result from the table 12 shows that variable costs were computed as follows: cost of fish (₦14,820,000), transportation (₦46,800), rent (₦20,400), miscellaneous (₦31,200) and this gives a total variable cost (TVC) of (₦14,918,400). The result also shows that gross revenue were computed as revenue from fish sales (₦18,720,000) and this gives a total revenue (TR) of (₦5,824,000). And result from the table 12 shows that fixed cost were computed as follows: cost of bags (₦2,500), cost of table (₦3,000) which gives a total fixed cost (TFC) (₦5,500). From the above result, gross margin (GM) were computed as follows: total revenue (TR) (₦18,720,000) minus total variable cost (TVC) (₦14,918,400) which gives (₦3,801,600). But profit (π) were computed as follows: gross margin (GM) (₦3,801,600) minus total fixed cost (TFC) (₦5,500) gives (₦3,796,100). Therefore, the results obtained from table 12 shows that, the net profit (π) for sales of dried electric fish (*Malapterurus electricus*) gives (₦3,796,100).

The Gross Margin for Stock fish (*Gadus morhua*)

Table 13: The result of the analysis of gross margin for stock fish (*Gadus morhua*) is presented below.

1. Variable Cost	Amount
Cost of fish	6,240,000
Transportation	234,000
Rent	20,400
Miscellaneous	46,000
Total variable cost (TVC)	**6,724,800**
2. Gross revenue	
Revenue from fish selling	7,722,200
Total revenue (TR)	**7,722,200**
3. Fixed cost	
Cost bags	3,700
Cost of table	2,500
Total fixed cost (TFC)	**6,200**

Source: Field survey, 2014.

The result from the table 13, shows that variable costs were computed as follows: cost of fish (₦6,240,000), transportation (₦234,000), rent (₦20,000), miscellaneous (₦46,000) and this gives a total variable cost of (TVC) of (₦6,724,800). The result shows also that gross revenue were computed as revenue from fish sales (₦7,722,000) and this gives a total revenue (TR) of (₦7,722,000). And result from table 13 shows that fixed cost were computed as follows: cost of bags (₦3,700), cost of table (₦2,500) which gives a total fixed cost (TFC) of (₦6,200). The result obtained from the total variable cost (TVC), total revenue (TR) were used to computed gross margin (GM) as follows: total revenue (TR) (₦7,722,000) minus total variable cost (TVC) (₦6,724,800) which gives (₦997,200). But profit (π) were computed as: gross margin (GM) (₦997,200) minus total fixed cost (TFC) (₦6,200) gives (₦991,200). Therefore, the results obtained from table 13 shows that, the net profit (π) for selling of stock fish (*Gadus morhua*) gives (₦991,000).

4.1.12 The Gross Margin for Dried Bonga (*Ethmalosa fimbriata*)

Table 14: The result of the analysis of gross margin for dried Bonga (*Ethmalosa fimbriata*) is presented below.

1. Variable Cost	Amount
Cost of fish	2,496,000
Transportation	46,800
Rent	20,400
Miscellaneous	46,800
Total variable cost (TVC)	**2,610,000**
2. Gross revenue	
Revenue from fish selling	3,120,000
Total revenue (TR)	**3,120,000**
3. Fixed cost	
Cost bags	2,500
Cost of table	2,000
Total fixed cost (TFC)	**4,500**

Source: Field survey, 2014.

The result from the table 14, shows that variable costs were computed as follows: cost of fish (₦2,496,000), transportation (₦46,800), rent (₦20,400), miscellaneous (₦46,800) and this gives a total variable cost (TVC) of (₦2,610,000). The result also shows that gross revenue were computed as revenue from fish sales (₦3,120,000) and this gives a total revenue (TR) of (₦3,120,000). And result from table 14 shows that fixed cost were computed as follows: cost of bags (₦2,500), cost of table (₦2,000) which gives a total fixed cost (TFC) of (4,500). The result obtained from the total variable cost (TVC), total revenue (TR) were used to computed gross margin (GM) as follows: total revenue (TR) (₦3,120,000) minus total variable cost (TVC) (₦2,610,000) which gives (₦510,000). But profit (π) were computed as: gross margin (GM) (₦510,000) minus total fixed cost (TFC) gives (₦505,500). Therefore, the results obtained from table 14 shows that, the net profit (π) for selling of Bonga (*Ethmalisa fimbiriata*) gives (₦505,500).

4.1.13 The Gross Margin for Mangala (*Bargi mangala*)

Table 15: The result of the analysis of gross margin for dried mangala (*Bargi mangala*) is presented below.

1. Variable Cost	Amount
Cost of fish	1,404,000
Transportation	10,400
Rent	21,600
Miscellaneous	15,600
Total variable cost (TVC)	**1,451,600**
2. Gross revenue	
Revenue from fish selling	2,080,000
Total revenue (TR)	**2,080,000**
3. Fixed cost	
Cost bags	2,000
Cost of table	2,300
Total fixed cost (TFC)	**4,300**

Source: Field survey, 2014.

The result from the table 10 shows that variable costs were computed as follows: cost of fish (₦1,404,000), transportation (₦10,400), rent (₦21,600), miscellaneous (₦15,600) and this gives a total variable cost (TVC) of (₦1,451,600). The result shows also that gross revenue were computed as revenue from fish sales (₦2,080,000) and this gives a total revenue (TR) of (₦2,080,000). And result from table 15 shows that fixed cost were computed as follows: cost of bags (₦2,000), cost of table (₦2,300) which gives a total fixed cost (TFC) of (₦4,300). The result obtained from the total variable cost (TVC), total revenue (TR), were used to compute gross margin (GM) as follows: total revenue (TR) (₦2,080,000) minus total variable cost (TVC) (₦1,451,600) which gives (₦628,400). But profit (π) were computed as follows: gross margin (GM) (₦628,400) minus total fixed cost (TFC) (4,300) gives (624,100). Therefore, the result obtained from table 15 shows that, the net profit (π) for sales of dried mangala (*Bargi mangala*) gives (₦624,100).

4.1.14 The Gross Margin for local Smoked Catfish

Table 16: The result of the analysis of gross margin for smoked catfish (*Clarias gariepinus*) is presented below.

1. Variable Cost	Amount
Cost of fish	2,184,000
Transportation	127,400
Miscellaneous	127,400
Total variable cost (TVC)	**2,438,800**
2. Gross revenue	
Revenue from fish selling	4,368,000
Total revenue (TR)	**4,368,000**
3. Fixed cost	
Basin	3,000
Total fixed cost (TFC)	**3,000**

Source: Field survey, 2014.

The result from the table 16 shows that variable costs were computed as follows: cost of fish (₦2,184,000), transportation (₦127,400), miscellaneous (₦127,400) and this gives a total variable cost (TVC) of (₦2,438,800). The result shows also that gross revenue were computed as revenue from fish sales (₦4,368,000) and this gives a total revenue (TR) of (₦4,368,000). And result from table 16 shows that fixed cost were computed as: cost of basin (₦3,000) which gives total fixed cost TFC) of (₦3,000). The result obtained from the total variable cost (TVC), total revenue (TR), were used to compute gross margin (GM) as follow: total revenue (TR) (₦4,368,000) minus total variable cost (TVC) (₦2,438,800) which gives (₦1,929,200). But profit (π) were computed as follows: gross margin (GM) (₦1,929,200) minus total fixed cost (TFC) (₦3,000) gives (₦1,926,200). Therefore, the result obtained from table 16 shows that, the net profit (π) for sales of local smoked catfish (*Clarias gariepinus*) gives (₦1,926,200). The result obtain from data generated and presented in table 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16 shows the net profit of different species and forms of fishes sold in Abakaliki market. The result shows that four(4) different species are sold fresh while the same five(5) species can also be smoked and five(5) species are dried fish.

All the net profits of different fishes sold in the market are presented in table 17. The result shows that, out of the different fishes analysis, smoked scomber (*Scomber japonctatus*) has the highest net profit of (₦4,093,600), followed by sales of dried electric fish (*Malapterurus electricus*) with net profit of (₦3,796,100) and sales of fresh scomber (*Scomber japonctatus*) with net profit of (₦3,629,180). The result also shows that from the analysis of the fishes sold in Abakaliki market, dried Bonga (*Ethmalosa fimbriata*) has the least net profit of (₦110,130) followed by the sales of dried catfish (*Clarias gariepinus*) with net profit of (₦133,600) and sales of fresh sardine (*Sardinella aurita*) with net profit of (₦505,500).

The Net Profit Margin
Table 17: Profit margin of the different fishes sold in Abakaliki market.

Scientific name of fishes sold	Common name of fishes sold	Local name of fishes sold	Net profit
FRESH FISHES SOLD			
Scomber japonctatus	Scomber	Ezigboazu	₦3,629,180
Trachurus japonicus	Mackerel	Shinny	₦615,680
Sardinella aurita	Sardine	Chizoba	₦110,130
	Spotted fish	Nwawo	₦661,180
SMOKED FISHES SOLD			
Scomber japonctatus	Scomber	Ezigbo azu	₦4,093,600
Trachurus japonicus	Mackerel	Shinny	₦852,600
Sardinella aurita	Sardine	Chizoba	₦652,400
	Spotted fish	Nwawo	₦943,600
	Local catfish	Emah	₦1,926,200
DRIED FISHES SOLD			
Clarias gariepinus	Catfish	Arira	₦133,600
Malapterurus electricus	Electric fish	Mpete	₦3,796,100
Gadus morhua	Stock fish	Apama/Okporoko	₦991,000
Ethmalosa fimbriata	Bonga	Okpo	₦505,500
Bargi mangala	Mangala	Mangala	₦624,100

Source: Field survey, 2014.

The information gathered shows that smoked horse has the highest net profit of ₦4,093,600 followed by those marketing dry fish especially electric fish (*Malapterurus electricus)* with net profit of ₦3,796,100. The data generated in the course of these research reveal that majority of fish marketers deals with fresh fishes especially scomber (*Scomber japonctatus*) with net profit of ₦3,629,180. These may be as a result of the ease in selling fresh fish which indicated majority of fish marketers within the study area dealing with fresh horse. Based on gross margin and net profit presented when compared it reveals that fish marketing within the study area is a lucrative business, from the result it shows that selling of both smoked and fresh scomber (*Scomber japonctatus*) is more lucrative than every other fish marketing within the study area.

It is also advice based on the data presented that apart from selling either smoked or fresh scomber (*Scomber japonctatus*) as a lucrative business, one can still market dried electric fish (*Malapterurus electricus*) also as a lucrative business within the study area.

Factors Affecting the Quality and Quantity of Fish Sold by Fish Marketers in Abakaliki Urban

Table 18: Factors affecting the quality and quantity of species handled by fish marketers in Abakaliki market.

Factors	Response	Scale	Decision
Financial problem	Yes	3.8	Accepted
Consumers choice	Yes	3.7	Accepted
Inadequate fish supply	No	2.5	Rejected
Cost of fishes	Yes	3.3	Accepted
Poverty of the consumers	Yes	3.1	Accepted
Unavailability of fishes	No	2.7	Rejected
Lack of access to cold rooms	No	2.2	Rejected
Fear on the side of marketers	No	2.4	Rejected
Cost of transportation	Yes	3.0	Accepted
Inadequate storage facility	Yes	3.5	Accepted
Problems of smoking the fishes	Yes	3.5	Accepted
Epileptic power supply	Yes	3.0	Accepted
Cost of firewood	No	2.6	Rejected

Source: Field survey, 2014.

The analysis presented on the table 18 was based on 5-point likert scale in which the decision rule was 3.0 and any value below it was rejected. Based on the analysis in table 18, it was observed that financial problem 3.8 is the major factors affecting the quality and quantity of fish marketed in Abakaliki Urban. Other major factors include consumer's taste and preference (3.7), inadequate storage facility (3.5), problems of smoking the fishes (3.5) and cost of fishes (3.3). These are the main factors that determine the quality and quantity of fish that are sold in Abakaliki urban, other factors according to the respondents are poverty of the consumers (3.1), cost of transportation (3.0) and epileptic power supply affects the quality and quantity of fishes in the study area.

Recommended Solutions for Improving fish marketing in Abakaliki Urban

A number of solutions were presented and analyzed in table 20. The fish marketers in the study area has made their suggestions and agreed with some solutions presented in table 20 below.

Table 20: Recommended solutions for improving fish marketing in Abakaliki Urban

Factors	Response	Scale	Decision
Government should provide more cold rooms/storage facilities	Yes	3.5	Accepted
Government should provide more cold rooms/storage facilities	Yes	3.5	Accepted
Government should provide processing places/space	Yes	3.2	Accepted
There should be subsidy in price of fish by government	Yes	3.6	Accepted
Transportation facilities should be enhanced	Yes	3.5	Accepted

Source: Field survey, 2014.

The analysis presented on table 20 was based on 5-point likert scale in which the decision rule was 3.0 and any value below it was rejected. Based on the analysis in table 20, it was observed that solutions suggested was based on government coming to their aids for ease in fish marketing and all the solutions were accepted starting from subsidy in price of fish by government (3.6), provision of more cold rooms/storage facilities by government (3.5), enhancement of transportation facilities by government (3.5) and provision of processing space/places (3.2). Were the solution presented in table 20 and was accepted.

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