

## COST- BENEFIT ANALYSIS OF MARKETING BONGA FISH (*Ethmalosa fimbriata*) IN EBONYI RURAL MARKETS

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### ABSTRACT

Comparative analysis of the costs and returns of selling differently processed Bonga Fish (*Ethmalosa fimbriata*) in different forms in Ebonyi rural markets was carried out with a population of 80 fish sellers from about 11 selected rural fish markets from each of the zones excluding the urban areas. The data were collected through well-structured questionnaire and interview schedule. Frequency and percentage were used to ascertain the different processed forms Bonga Fish were sold in the study area, whereas gross margin analysis was used to ascertain the different profit margins obtained from selling fish in different forms. The result showed that majority of the Bonga Fish marketers (42.50%) sold their Fishes in dried form, whereas, the least population (1.25%) sold theirs in fried form. The study showed that there was a significant difference in selling Bonga Fish at different forms as observed by the different profit margins of N457,020, N503,720, and N634,660 for iced, smoked, and dried Bonga respectively. Therefore, fish sellers should sell their Bonga fish in dried form since there is no refrigerator or source of electricity and as this is the most lucrative form of selling fish in the study area.

**Keywords:** Marketing, Bonga Fish, Gross margin analysis

### INTRODUCTION

American Marketing Association (AMA, 2014) defines marketing as the performance of business activities that directs the flow of goods and services from producers to users. It includes a surprisingly wide range of activities according to Rewoldt (2012). Fish marketing is a vital economic activity and livelihood component of rural communities living beside rivers and river floodplains in East Africa (FAO, 2007; Mbugua, 2008). It provides a good alternative source of income for rural communities, particularly women; since it can be carried out with a minimal investment close to homesteads and can be integrated into existing farming systems (FAO, 2010). The market margin is an important indicator of market performance (Olukosi and Isitor, 1990). The middlemen performing the role of marketing are being accused of earning higher profits in the marketing system (Bryceson, 1993). Marketing can be defined as the process of planning and executing the conception, pricing, promotion and distribution ideas, goods and services to create exchange that satisfies the individual and organizational objectives (Gregor *et al.*, 1994). Kotler (1989) proposed that the societal market conceptualized more recent versions of ethnic marketing and green marketing. In summary, marketing is the process in a society by which the demand structure for economic goods and services is enlarged and satisfied through the conception, promotion, exchange and physical distribution of such goods and services. According to Nwabunike and Okuwe (2014) marketing plays an important role in the market economy. According to Sen (2005) in

Drunker (1974) reported that marketing started in Japan in the 7th century by Mitsaw family of Tokyo. The west started marketing in the middle of the 19th century visible in the academics and business scenes

A fish market is a place used for marketing of fish and fish products. However, fish marketing essentially consists of all the activities involved in delivering fish from one producer to the consumer, while distribution provides channels that link the marketing institutions and producers together. As the fish like any other production moves closer to the ultimate consumer, the selling price increases since the margins of the various intermediaries and functionaries are added to it. Fresh fish is one of the perishable food staples. Fish spoils very fast because of the intrinsic and extrinsic factors. The high ambient temperature in tropics has an effect on the spoilage of fish by catalysing the actions of bacteria, enzymes and chemical oxidation of fat in the body of the fish. Post-harvesting losses may occur at the different stages from capture to marketing of the fish. With the decline in fish supply in meeting the demands of the increasing population, high post-harvest losses are significantly reduced and production is increased through improved management, fish handling, processing, storage and distribution.

Post-harvest losses are processing losses (from processors) and marketing losses (from seller and buyers). These have been estimated at not less than 30% (Tobor, 1984). It extend the shelf-life of fish and fish product, It minimize spoilage of fish. It make available the supply of fish in good

condition, it reduces market losses experienced by the fish marketers. The component of post-harvest technology includes the following: Handling, Preservation, Processing, Utilization, Storage and marketing. Good handling of fish from point of harvest to final consumption is very essential for the quality of fish to be maintained. Fish handling involve all the procedure aimed at maintaining the quality of fish. Azeza (1977) and Eyo (1999) observed that fishermen lose a great proportion of their catches due to poor handling of the fish (Davies *et al.*, 2008). Preservation and processing methods explore ways by which spoilage are stopped or slowed down to give product a longer shelf life. Processing methods usually change the texture, taste, and physical appearance of the fish. FAO (2005) gave three main fish processing methods as drying, salting and smoking. If fish is not sold fresh, preservation methods should be applied to extend shelf-life. These include freezing, smoking, drying and heat treatment (Sterilization, pasteurization, etc). Efficient preparation of fish is important when top quality, maximum yield and highest possible profits are to be achieved. According to Davies *et al.* (2008) the processed fishery products were still stored using traditional storage technologies. The long distance of distribution necessitates some processing and storage since preservation through refrigeration is not readily available (Agbon *et al.*, 2002). Lack of adequate fish handling, processing techniques and storage facilities contribute significantly to the low supply of fish to poor rural dwellers that form three quarters of the population in developing countries (Ayuba and Omeji, 2006). Ayuba and Omeji (2006) also reported that the insect infestation is

the cause of most prominent losses in quality and quantity of stored, dried fish in Nigeria.

Fish marketing involves the performances of all business activities involved in the flow of fish from the one point of initial production until they arrived in the hand of the consumers in order to satisfy consumption and accomplish the company's objectives. The need to understand the Fish-market structure of the Ebonyi rural markets is paramount since there has been a bridge in knowledge about the different profit margins made by marketers who sell different fish species in different forms in the rural markets. Thus, this study tries to find out the different profit margins obtained from the sale of Bonga (*Ethmalosa Fimbriata*) in different forms and as a case study, dry, iced, and smoked.

### Study Area

Ebonyi State is the study area. It consists of three senatorial zones, Ebonyi North, Ebonyi South and Ebonyi Central. It is bounded to the north by Benue state, to the south by Enugu state, to the east by Cross Rivers State and to the west by Abia State. With a land area of about 5, 935 sq km, the state lies approximately at longitude 7A0 300 and 8A0 300E and latitude 5A0 45N. Ebonyi State is popularly known as the salt of the nation because of the large deposit of salt water in the state. The vegetation of the state is a mixture of Savannah and Semi-tropical forest. Fishing activities predominate in all Zones of the State. Ekpe *et al.* (2005) noted that three main seasons prevail in the area; the Rainy (wet) season which spans from early April to early November, the harmattan period which last between mid-November to late January and the dry season which lasts from late January to early April.



Ebonyi north -----pink ,Ebonyi central -----yellow ,Ebonyi south-----blue.

## MATERIALS AND METHODS

### Sampling Techniques

This was done by random sampling technique. It is a simple sampling method in which samples are randomly picked from the population. It was a type of survey conducted face to face, using simple sampling methodology. It was based on the number of the contact fish sellers and consumers in the rural communities of Ebonyi State.

### The Study Population

The total of eighty (80) fish sellers from eleven (11) selected rural fish markets from each of the local government areas of Ebonyi State excluding the urban areas were sampled from June to December 2014 as shown in Table one.

### Source of Data

Primary data were obtained with the use of a comprehensive structured questionnaire for interviews. The questionnaire was administered in the rural market using selected respondents. Secondary data were obtained from a published material such as journals, textbooks, newspaper etc.

### Analytical Technique

#### Frequency and Percentage

Frequency and percentage were used to analyze the distribution of respondents. Data collected were analysed using non-parametric (descriptive) statistics, enterprise budgeting technique (Okeke-Agulu and Chukwuone, 2012) and the benefit-cost ratio (Amos and Bolorunduro, 2000).

#### Model Specification

$$X = (F/N) \times (100/1)$$

Where F= Frequency

N = Total number of respondents

X = mean frequency

### Gross Margin Analysis

The budgetary technique was used to determine the gross margin income of fish marketers. Model to be used in estimating the gross margin is:

$$GMI = \Sigma TR - \Sigma TV$$

$$TVC = \sum P_{xi} X$$

$$TC = TVC + TFC$$

$$NI = GM - TFC$$

Where,

$$GM = TR - TVC$$

$$II = GM - TFC$$

Where GM – Gross Margin

TR = Total Revenue

II = Profit

TVC = Total Variable Cost

TFC = Total Fixed Cost

### Benefit Cost Ratio

The benefit cost ratio was used to ascertain how much was returned to every N1 invested in marketing of Bonga fish in different forms.

The formula is given in as;

$$BCR = \frac{TR \text{ (Total Revenue)}}{TVC \text{ (Total Variable Cost)}}$$

## RESULTS

### Forms of Marketing Bonga Fish

The result of the forms of marketing Bonga fish in the study area as presented in Table 3 was evident that a larger population (42.5%) processed their fishes into dried form before selling while the least population (1.25%) processed their fishes into fried form before selling. Obviously, other forms of fish processing identified were; smoked, iced, as well as smoked and dried.

### Comparative Analysis of Marketing Bonga Fish Iced Form of Marketing Bonga Fish

Result of the gross margin analysis as presented in Table 4 showed that there was a gross margin of ₦ 526,720, a profit of ₦ 525,020 as well as a benefit of ₦ 1.684 to every ₦ 1 invested in Bonga fish marketing in the iced form.

### Smoked Form of Marketing Bonga Fish

Result of the gross margin analysis as presented in Table 5 showed that there was a gross margin of ₦ 505,920, a profit of ₦ 503,720 as well as a benefit of ₦ 1.510 to every ₦ 1 invested in Bonga fish marketing in the smoked form.

### Dried Form of Marketing Bonga Fish

Result of the gross margin analysis as presented in Table 6 showed that there was a gross margin of ₦ 694,960, a profit of ₦ 686,660 as well as a benefit of ₦ 1.705 to every ₦ 1 invested in Bonga fish marketing in the dried form.

**Table 1: Villages visited and the names of their market**

Location	Name of market	Zone
Nkaliki	Eke aba	Ebonyi North
Onueke	Eke Imoha	Ebonyi Central
Oshiri	Eke Oshiri	Ebonyi South
Okposi	Eke Okposi	Ebonyi South
Amiach (Ezza)	Orie Egbe	Ebonyi Central
Amasiri	Orie Amasiri	Ebonyi South
Ohazara	Nkwo ugwulangwu	Ebonyi South
Ishieke	Ogbala Ishieke	Ebonyi North
Iboko	Iboko	Ebonyi North
Unagboke	EduguUnagboke	Ebonyi North
Omege	Omege Echara	Ebonyi South

Source: Field survey, 2014.

**Table 2: Location for fish products in Ebonyi State (Target Population)**

Ebonyi North	Ebonyi South	Ebonyi Central
Abakpa	Afor Owutu	Eke Imoha*
Rice Mill	Eke Afikpo	Afor Ezekuna
Kpirikpiri	Eke Okposi*	Orie Egbe*
Eke Aba *	Orie Amasiri*	Omege Echara*
Okwo	Nkwo Akaeze	Nweke Ishiofia
Iboko*	Eke Ishiahu	Ohafia Agba
Iziogo	Nkwo Ugwuluangwu *	Igboji
Eke Iziah	Afor Unwana	Afor Nkomoro
Effium	Afor Onicha	Orie Nkalaha*
Edugu Nnagboke*	Eke Oshiri*	

Source: A Publication of Ministry of Information and State Orientation.

**Table 3: Identification of the forms by which Bonga Fish is sold**

Forms	Responses	Percentage
Smoked	14	17.5%
Iced	21	26.25%
Dried	34	42.5%
Both smoked and dried	10	12.5%
Fried	1	1.25%
<b>Total</b>	<b>80</b>	<b>100%</b>

Source: Field survey December 2014.

**Table 4: Analysis results of gross margin for iced Bonga (*Ethmalosa fimbriata*)**

Variables	Unit	Quantity	Unit cost (₦)	Amount (₦)
<b>1) Variable cost</b>				
Cost of fish purchase	Carton	48	15,000	720,000
Transportation	-	-	-	7,200
Rent	-	-	-	20,880
Miscellaneous	-	-	-	19,200
<b>Total variable cost TVC</b>				<b>769,280</b>
<b>2) Gross Revenue</b>				
Sale of Medium sizes of Bonga ( <i>Ethmalosa fimbriata</i> )	Per medum sized fish	3811	340	1,296,000
<b>Total revenue (TR)</b>				<b>1,296,000</b>
<b>3) Fixed cost</b>				
Knife	-	-	-	500
Table	-	-	-	1,200
<b>Total fixed cost (TFC)</b>				<b>1,700</b>

Source: Field survey, December, 2014.

**Table 5: Analysis result of gross margin for smoked Bonga (*Ethmalosa fimbriata*)**

Variables	Unit	Quantity	Unit cost (₦)	Amount (₦)
<b>1) Variable cost</b>				
Cost of fish	Carton	63	15,000	940,800
Transportation	-	-	-	4,800
Rent	-	-	-	2880
Firewood	-	-	-	9,600
Miscellaneous	-	-	-	33,600
<b>Total variable cost (TVC)</b>				<b>991, 680</b>
<b>2) Gross Revenue</b>				
Revenue for selling smoked Bonga fish				1,497 600
<b>Total Revenue (TR)</b>	Per medum sized fish	4,680	320	<b>1,497,600</b>
<b>3) Fixed cost</b>				
Smoking kiln	-	-	-	1,300
Knife	-	-	-	900
<b>Total fixed cost (TFC)</b>	-	-	-	<b>2,200</b>

Source: field survey, December 2014.

## DISCUSSION

According to the findings as presented in Table 4, it was reported that fish marketing in iced form was profitable given a profit of ₦ 525,020 as well as a benefit of ₦ 1.684 to every ₦ 1 invested in Bonga fish marketing in the iced form. This connoted that a good number of the marketers who sold their fishes in iced form still made profit from the venture. This corroborates the finding of Davis et al., (2008) who was of the view that among the profitable forms of fish marketing is iced form. Similarly, Azeza (1976) reported that one of the acceptable forms of marketing fish in the Lake Chad basin is iced form.

It was also disclosed in Table 5 that marketing bonga fish in smoked form yielded high profit of ₦ 503,720 as well as a benefit of ₦ 1.510 to every ₦ 1 invested. This implies that it is advisable to engage in bonga fish marketing in the smoked form. This research aligns adequately with the report of Ali et al., (2008) which reported that rural farmers made significant profit from marketing fish in the smoked form. Again, Ayuba and Omeji (2006) argued that due to low infestation of insects on smoked fishes, rural fish marketers have found smoking as a reliable method of fish processing and marketing which is also profitable.

Result of the analysis on the profitability of selling bonga fish in dried form as presented in Table 6 showed that there was a gross margin of ₦ 694,960, a profit of ₦ 686,660 as well as a benefit of ₦ 1.705 to every ₦ 1 invested. The implication of this finding is that dried bonga fish marketing posed a very profitable venture since it recorded high gain to investment level. This is in tandem with FAO (2010) which reported that fish drying is the safest and most acceptable method of fish preservation and marketing in rural communities in Africa. The reason for this is its comparative advantage over iced fish preservation method which is costly to maintain because of poor rural electrification as well as

smoking which does not ensure long shelf-life of fishes. Drying does not

require much of resources and achieves longer shelf-life. This makes it possible for the marketer's to still sell their fish products after a long period of time. In a similar study, Lawal and Idega (2004) posited that drying is a predominant method of fish preservation and marketing and yielded higher profit.

Comparatively, it was observed that the most profitable fish processing and marketing method in the area was drying which recorded a return of ₦ 1.705 as against iced and smoked methods with corresponding ₦ 1.684 and ₦ 1.510 respectively to every ₦ 1 invested in the bonga fish marketing.

## CONCLUSION AND RECOMMENDATIONS

In conclusion, it was observed that majority of the Bonga Fish marketers (42.50%) in the study area sold their fish in the dried form which yielded more profit unlike selling it in either iced or smoked forms. The researchers, therefore, recommend among the following that; Government should provide electricity to the rural area and central cold room for the fish sellers since there is no electricity to encourage refrigeration of fishes, young school leavers should go into the sale of Bonga fish since it is a lucrative business. Again, fish sellers should sell their Bonga fish in dried form since this is the most lucrative form of selling the fish in the study area.

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