Full Length Article

Economics of Smoked and Dried Fish Marketing in Yola North and South Local Government Areas of Adamawa State, Nigeria

A.H. ILIYASU[1], J.I. ONU†, A. MIDAU AND J.S. FINTAN
Adamawa State University Mubi, Nigeria
†*Federal University of Technology Yola Adamawa State, Nigeria*
[1]Corresponding author's e-mail: altine_j@yahoo.com

ABSTRACT

This study was designed to investigate the economics of smoked and dried fish marketing in Yola North and South local Government areas of Adamawa State. Data were collected from eighty respondents who were randomly sampled from markets in Yola North and South local LGA of Adamawa State. The data were analyzed using multiple regression, operational efficiency, profit and market margin formula. The results indicates that it is profitable to venture in to smoked and dried fish marketing given a profit margin of ₦18, 492, 119.55/annum, ₦142.03/kg of fish and return on investment of 0.47. The result also revealed a market margin of 40%, which could be attributed to less marketing functions performed. The operational efficiency was 287.9%, though transport efficiency reveals high transport cost. It is evident that smoked/dry fish market is highly efficient in its operations. Thus, it is imperative that marketers should form cooperative societies to reduce the effect of market intermediaries and government should improve rural feeder roads to enhance free flow of fish from rural to urban markets in the study area. © 2011 Friends Science Publishers

Key Words: Smoked and dried fish; Economics; Nigeria

INTRODUCTION

Marketing is of high importance to agriculture, thus, "before we think of production, we must first of all think of an available market for such a product" (Kohls & Uhl, 1980). He further stated that, the difficulty with the global food situation appears to be not how big a pie we can bake but how to cut and share the pieces. Agricultural production and fish marketing must develop hand in hand because they are partners in a progressive system. An efficient market is bound to foster the goals of economic development, namely increased real income and income redistribution. (Slater, 1993; Eziekor & Isitor, 1998).

Fish is an aquatic animal caught by man since the early times for food value (Spore, 1996). It is often the most popular diet in the world and was long termed the "poor mans protein". Furthermore, Biswas (1989) stated that fish is making an important contribution to world protein supply. Eyo (1992) also stated that, fish prices tend to raise by using sophisticated processing, handling, packaging and transportation methods, thus for higher returns, there is a need to spend more time and money on processing and marketing, this in turn gives room for better prices in the markets.

A market driven approach should open up new possibilities to reduce physical post harvest losses and also add value to harvest. Eyo (2001) explained that in the tropics, a significant quantity of fish is lost through absence of adequate technology and know-how to prevent such losses. Fish is perishable and must be processed within few hours of being caught, because no form of processing or preservation can improve the quality of spoilt fish.

Despite the impressive growth of fish production over the years, large portion of the rural and urban population remains protein deficient due to low incomes to purchase fish (Goeff *et al.,* 1995). Thus it is clear that an inefficient marketing system gives substantial costs to consumers. Also transportation of fish has constituted a serious problem in marketing due to its perishable nature (Vording, 1987). 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 economics of smoked and dried fish marketing in two local government areas of Adamawa state. The specific objectives were to:

i. Analyse the profitability of smoked and dried fish marketing.
ii. Determine the operational efficiency of smoked and dried fish marketing.
iii. Analyse the transport efficiency in smoked and dried fish marketing.

The profitability analyses will serve as a tool for investment decision for smoked/dried fish marketers in the

---

study area. A study of this nature will also bring adjustment in the market structure to improve efficiency of marketing in the study area and the state in general. Policy makers will find information provided in this study invaluable in adjusting existing policies and/or enact new ones that would lead to increased market performance in the study area.

MATERIALS AND METHODS

The study area: Yola north and south local government areas are both located on the latitude $9^0 14$ north of the equator and longitude $12^0 28$ east of the Greenwich meridian (Adebayo, 1999). The area has mean annual rainfall of less than 1000 mm and an annual maximum temperature range of $39^oC – 45^oC$ characterizes it (Adebayo, 1997). They both have a total land area of 1,213 km^2 and a total population of 226.2 persons per km^2 (2006, population census). The major occupation of the inhabitants of the area includes farming, fishing and rearing animals. Rivers and lakes are found in both local government areas among, which are rivers Benue, Gongola and Njuwa lake. Major crops grown include maize, rice, sorghum, cassava and yam, while cash crops are cotton, groundnuts and sugarcane (Sajo & Kaddams, 1999).

Data collection and sampling procedure: The data for this study was collected from randomly selected smoked/dried fish marketers. Simple random sampling technique was employed in the selection of 80 smoked/dried fish marketers in the study area. A sampling frame of 210 marketers was obtained from Jimeta and Yola markets comprising a list of all smoked/dried fish marketers in a ratio proportional to market size i.e., 132 in Jimeta market and 78 in Yola market. 50 respondents were sampled in Jimeta and 30 in Yola markets, respectively.

Analytical techniques: The return on investment, profit and market margin analysis was used to determine the profitability of smoked and dried fish marketing.

i.   The profit (π) analysis equation is given as:

$$\pi = TR\text{-}TVC$$

Where, π = profit per kg of fish sold.

TR = Total Revenue.

TVC = Total variable costs, which include costs of fish, transport cost, processing cost, labour cost, packaging cost, handling charges, union levy, produce and LGA tax.

ii. The market margin analysis equation is given as:

$$M.M = \frac{SP-CP}{SP} \times 100\%$$

Where, M.M = Market margin.

SP = Selling price.

CP = Cost price.

2.   The market operational efficiency was computed as follows:

$$ME = \frac{\text{Value added by marketing}}{\text{cost of marketing services}} \times 100\%$$

The value added through marketing was obtained by subtracting the total cost price of smoked/dried fish as it flows through the market from the total selling price. The cost of marketing services was obtained from the total cost of providing marketing functions such as storage processing, transportation, handling charges and market taxes.

3.   It was postulated that, transport cost is a function of load size and distance over, which the load is conveyed i.e., C (ai ∂i) (Fafchamps *et al.*, 2003). The data was fitted to a regression model of the form:

$$C_i^f\ (ai\ di) = \alpha_\theta q^\delta + ui$$

Where-: α, θ and $\mathcal{E}$ were parameters to be estimated.

ai = Load size.

di = Distance travelled.

U_i = Error term.

To ensure the selection of appropriate functional forms, the study experimented with four different functional forms. They are explicitly stated thus:

1.   Linear function:
     $Y = bo + b_1 x_1 + b_2 x_{2} + U_i$
2.   Double log function:
     $\ln y = \ln bo + b_1\ \ln x_{1} + b_2\ \ln x_2 + U_i$
3.   Semi log function:
     $y = \ln bo + b_1\ \ln x_{1} + b_2\ \ln x_2 + U_i$
4.   Exponential function:
     $\ln y = bo + b_1 x_{1} + b_2 x_2 + U_{i.}$

Where bi = coefficient of independent variables to be estimated.

The selected variables X_1 and X_2 are substituted for ai and di and they are as defined earlier. X_1 was expected to have a positive causal relationship, while X_2 was expected to be negative. They were included in the model to determine the extent to which each of them explains variation in transport cost. The criteria used in selecting the lead equation conformed to the apriori expected economic criteria for the magnitude of coefficients, magnitudes of standard error, signs and significance of the coefficients of multiple determinations (R^2), F-value and T-ratios.

RESULTS AND DISCUSSION

The result of the profit and market margin analysis per kg of smoked and dried fish marketed is presented in Table I. The result reveals a profit of ₦ 18,492,119.55 per annum and ₦142.03 per kg of fish. Return on investment was also used in profitability analysis, from the values in Table I, it is seen that return on investment was ₦0.47 i.e., every one naira invested brought in ₦0.47 (47 kobo) analogically this was equivalent to 47% returns. Therefore, at a prevailing interest rate of 20% at that time, it implied that the returns were higher for investment in smoked and dried fish marketing than if the capital were kept in savings account

Table I: Profit and market margin analysis per km of smoked/dried fish

A	Function Variable cost	Costs (₦)	% of sales Receipts (₦)	%TVC (₦)
A1	Cost of fish	229.449	14.890	77.151
A2	Processing costs	0.063	0.004	0.021
A3	Packaging costs	4.803	0.312	1.615
A4	Transportation costs	14.311	0.929	4.812
A5	Handling charges	3.786	0.246	1.273
A6	Storage costs	17.817	1.156	5.991
A7	Labor costs	5.815	0.377	1.955
A8	Market taxes	21.358	1.386	7.182
B=∑A_i	Total variable costs	297.403	19.299	100.000
C	Total revenue	1541.026	100.000	518.161
D	Profit margin	1243.620	80.701	418.159
E	Market margin	1311.58	85.111	441.011
F	Returns on investment	-	0.47	-

Source: Survey Data

Tale II: Results of regression for transport efficiency of marketers

Explanatory variables	Equation form	
	Exponential	Double-log
Constant term	1.775	0.712
	(23.494)***	(2.762)***
X_1 Load Size	0.000187	0.433
	(2.353)**	(3.812)***
X_2 Distance	0.0000317	0.0726
	(2.161)**	(0.974)
R^2 (%)	17.9	24.0
F-value	8.36	12.15
S-error	0.54722	0.52639

*** ➔ Significant at 1% level

R^2 =24.0%

F-value=12.15

S-error= 0.52639

The values in parenthesis are t-ratios.

with the bank. The market margin was found to be 39.8%. This implies that smoked and dried fish marketers perform less services in transferring smoked/dried fish from the point of production to the point of consumption, hence the low percentage.

Market operational efficiency: The market operational efficiency was 287.9% implying high efficiency in smoked and dried fish marketing.

Market transport efficiency: The result of the transport efficiency, which was tested as an indicator of market performance is presented in Table II. The result of the Double log function that was selected as the lead equation in determining the efficiency of transport is presented below:

$$\ell n \, Y = \ell n \, 0.712 + 0.433 \, \ell n \, X_1 + 0.0726 \, \ell n \, X_2$$
$$(2.762) \quad *** \quad (3.812)*** \quad (0.974)$$
$$R^2 = 0.240, \, F = 12.15$$

***=significant at 1% level.

Values in parenthesis are t-ratios.

The coefficient of multiple determinations (R^2) was 0.240 indicating that 24.0% of the variation in transport cost is accounted for by the variations in the explanatory variables used in the model. This (R^2) is low which may be

due to the few variables used in the regression, if more variables were introduced, it would have explained the transport efficiency better. Also both X_1 (loadsize) and X_2 (distance travelled) have positive coefficients, X_1 (loadsize) is significant at 1% level. By implication it means that the law of maximization of size takes place in relation to quantity of smoked/dried fish i.e., an increase in loadsize brings about maximum utilization of transportation available by increasing the quantity of smoked and dried fish marketed in the area. On the other hand X_2 (distance travelled) is positive, which was not expected because any increase in distance travelled increases transport cost and thus reduces the transport efficiency. Also X_2 (distance travelled) is not significant, this by implication means an increase in X_2 will not significantly increase transport efficiency.

CONCLUSION

It evident that smoked/dried fish marketing in the study area is efficient. It is also evident from the result obtained that it is worthwhile to invest in smoked and dried fish marketing in the study area. Also transport efficiency shows that X_1 (loadsize) is positive and significant at 1% level, thus any increase in this variable increases transport efficiency. Therefore, the law of maximization of size takes place i.e., as transport cost increases, marketers will maximize the use of transportation but there is a need for smoked and dried fish marketers to form a very strong cooperative society so as to reduce the effect of market intermediaries. Furthermore, government should embark on the construction/rehabilitation of rural feeder roads to allow for easy and cheap flow of fish from rural to urban centers where demand is high.

REFERENCES

Adebayo, A.A., 1997. The application of agroclimatology to agricultural planning in Adamawa state. *J. App. Sci. Manag.*, 1: 69–75

Adebayo, A.A., 1999. Climate II. *In:* Adebayo, A.A. and A.L. Tukur (eds.), *Adamawa State in Maps,* pp: 1–26. Paracelete Publishers, Yola, Nigeria

Biswas, K.P., 1989. *Fish, Fisheries and Technology*, Vol. 13, pp:493–496. Navendra book Delhi India Navendra publishing house 1417, Kishan Dutt street, Maiwara, Delhi, India

Eyo, A.A., 2001. *Fish Processing Technology in the Tropics.* University of Ilorin Press, Nigeria

Eyo, A.A., 1992. *Fish Handling, Preservation and Processing.* A paper presented at the improved management for agricultural training at Federal College of fresh water Freshries Technology, New Bussa. On 22nd Sept and 23rd Oct. 1992

Eziekor, I.G. and S.U. Isitor, 1998. "Analysing the critical issues in the sustainable funding of Agricultural marketing in Nigeria. *In*: Nwosu, A.C. and S.A. Mbanasor (eds.), *Sustainable Agricultural Investment in Nigeria: Proceedings of the 13th Annual Conference of Farm Management Association of Nigeria* (FAMAN). held at Federal University of Agriculture Umudike, Abia State, Nigeria

Fafchamps, M., E. Gbbre-Madhim and B. Mintem, 2003. *Increasing Returns and Marketing Efficiency in Agricultural Trade.* MTID Discussion paper, International food policy research Institute, 2033 K street, N.W. Waashington DC

Goeff, A. and C.J. Bennet, 1995. Fish mammies and tuna conglomerates: private sector fish processing and marketing in Ghana. *In*: Steven, J. and M. John (eds.), *Marketing Africa's High-value Foods,* pp: 375–416

Kohls, R.L. and J.N. Uhl, 1980. *Marketing of Agricultural Products,* 6th edition, p: 515. Macmillan publication company New York

Sajo, A.A. and A.M. Kaddams, 1999. Food and cash crops. *In*: Adebayo, A.A. and A.L. Tukur (eds.), *Adamawa State in Maps*, pp: 37–40. Paraclate publishers, Yola, Nigeria

Slater, C.J., 1993. Market channel co-ordination and economic development in agricultural and food marketing in developing countries. *In:* John, A. (ed.), *Agriculture and Food Marketing in Developing Countries: Selected Readings*. C.A.B. International Wallingford, U.K

Spore, 1986. *Getting Africa hooked on Fish Farming*, pp: 1–2. Bi-monthly bulletin of C.T.A information for Agricultural development in ACP countries, CTA publications Netherlands

Vording, A., 1987. *Fish Marketing in Pahang Malaysia: A Study in Marketing, Pricing and Distribution of Fish*. Monograph Department of Geography, University of Utrecht, Netherlands