

**MARKETING CHANNEL, COST, AND MARGINS OF CRAYFISH WHOLESALERS AND
RETAILERS IN RIVERS STATE, NIGERIA**

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ABSTRACT

Marketing channel, cost, and margins of crayfish in Rivers State, Nigeria was studied using a total eighty traders (thirty retailers and fifty wholesalers) selected from six major crayfish markets using a multi-stage sampling technique, six local government areas were selected purposively based on the existing crayfish trading activities, from each LGAs a major crayfish market was selected. Primary and secondary sources of data were collected for the study. The selling prices at wholesale and retail levels of the marketing channel and cost incurred in marketing were used to address the objectives. The results of the study showed that the direction of flow of crayfish, three marketing channels were identified, although, wholesalers get profit, they also incur more cost in marketing than retailers, the highest and lowest average selling price were recorded as ₦1834.43/kg and ₦1279.90/kg for crayfish traders, the consumers' price percentage that was received by the crayfish farmers (harvesters) is 28.90% and 16.69% of the net marketing margin on retail and wholesale respectively of the selling price, while both levels were inefficient in their marketing efficiency. The major challenges faced by crayfish traders in Rivers State were poor access to credit facilities, inadequate storage facilities and high market levy. Provision of government and private access to credit for traders, improved storage facilities and formulation and enactment of independent act for crayfish marketing were highly recommended.

Keywords: Marketing channel, crayfish, cost and margins

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INTRODUCTION

Crayfish is a familiar name known to most harvesters, traders and final users in Rivers State and elsewhere in Nigeria. In Nigeria, what is popularly referred to as crayfish is mainly the small shrimps composed of three families: *Palaemonidae*, *Hippolytidae*, and *Sergestidae* (Ngodigha, Abowei and Gbarabe, 2013). Crayfish is grouped as animal polypeptide, by which having a complete amino acid profile, high digestibility, and a significant organic and nutritive value that is necessary for good health and normal growth. It is suitable to supply adequate nutrients to cater for infants estimated daily nutrient requirements to eradicate protein energy malnutrition (PEM), in the developing countries (Adelle et al, 2010). Furthermore, health benefit of crayfish including supply of vitamin D and A, also present were mineral elements such as calcium, potassium copper, zinc and iodine, (Nahid 2009). Marketing is a very important factor for crayfish harvesting as a commercial product. Crayfish marketing and distribution is an integral

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aspect of its production because it involves all the processes of taking the crayfish from the water to the final consumer (Omorinkoba et al, 2011). Following established economic theories, such as the principle of comparative advantage which postulates that a nation will export the goods or services in which it has its greatest comparative advantage and import those in which it has the least comparative advantage (Golub and Hsieh, 2000). One expects the price of crayfish in Rivers State to be relatively low compared to prices selling in non-producing States in Nigeria. Crayfish prices in some markets of the State are higher than what is obtained in markets within non-producing States. Therefore, it seems that the benefits of competitive price advantage as stipulated by established economic theories have become intriguingly questionable in the case of crayfish marketing in Rivers state. Such anomaly critically limits the growth potential of the crayfish and seafood enterprises in the State thereby placing such an industry at huge risk of becoming unsustainable in the long-run. Crayfish trading is faced with seasonal price variations due to low catches (Japo et al., 2017) since most of the crayfish available for consumption are harvested from natural habitats. Thus, the development of better means to ensure maximum catch is required. The fishery sector (crayfish inclusive) is still characterized by rising tax bills, low output, high post-harvest losses and the marketing methods used by traditional/local fishers that involves spreading of crayfish on the floor using raffia bags which is unhygienic and leads to spoilage of crayfish (Bassey et al., 2015). Despite all the marketing challenges of crayfish which affect its supply and price, the demand of crayfish in the study area continue to be high, hence the need for the study of marketing of crayfish so as to make appropriate recommendations. The objectives are to examine the socio-economic characteristics of the traders, identify the crayfish marketing channel, determine the marketing cost and margin of the traders, and identify the challenges encountered by the traders (retailer and wholesalers).

MATERIAL AND METHOD

This study was carried out in Rivers State based on the existing crayfish trading activities. Rivers State lies between longitude 6°50 E and latitude 4°45 N (NPC, 2006). The sampling procedure thus adopted comprised a multi-stage sampling procedure. The first stage involved the purposive selection of six local government areas across the six popular crayfish marketing areas in Rivers State. The second stage comprised a selection of six major crayfish markets in each local government areas selected. The third stage comprised a random selection of eighty traders (thirty retailers and fifty wholesalers) interviewed for the study. The proportionality factor was introduced to select 50 crayfish wholesalers and 30 retailers for the study. A thirteen percent (13%) of the total population (sample frame) was drawn as the sample size. This gave a total of eighty (80) respondents for the study. The proportionality factor used according to Olubunmi (2013) is stated as thus:

$$S = \frac{p}{P * } n \quad (1)$$

Where:

S = the desired sample size of stratum

p = the number of respondents from a stratum.

P* = the number of respondents in all the districts in the State

n = the desire numbers of respondents to be selected for the study.

Using the proportionate sampling formula, 5 retailers and 15 wholesalers at Oyorokoto beach market (Andoni LGA), 5 retailers and 5 wholesalers at Akuku-toru market (Akuku-toru LGA), 5 retailers and 5 urban distributors at Asari-toru market (Asari-toru LGA), 5 retailers and 10 wholesalers at Creek road market (Port Harcourt LGA), 5 retailers and 5 urban distributors at Rumuokoro market (Obio-akpor LGA), and 5 retailers and 10 wholesalers at Mbiana market (Ahoada west LGA) were selected randomly in the study area. This gave a total sample size of 80 crayfish traders for the study. However, out of this 80-sample size, only 76 booklets of questionnaire were retrieved from the field. A breakdown of sample selection is presented in Table 1

However, only seventy-six of the respondent's information were processed for the study due to non-response. Primary data were collected through personal interviews, direct observations and structured questionnaire for the study. The objectives of the study were analysed using descriptive statistics such as frequency distribution and percentages (socio-economic characteristics and the marketing channel), and marketing margin model.

The cost of marketing crayfish was categorized as variable and fixed cost.

$$TMC_i = TVC_i + TFC_i \quad (2)$$

$$TVC_i = \sum_{i=1}^n Px_i \quad (3)$$

$$TFC_i = K_i \quad (4)$$

$$TMC_i = \sum_i^n Px_i + \sum_i^n K_i \quad (5)$$

Where,

TMC_i = Total marketing cost of crayfish (Naira/kg)

TVC_i = Total variable cost of crayfish (Naira/kg)

TFC_i = Total fixed cost of crayfish (Naira/kg)

= summation sign

Gross margin was calculated by subtracting the value of crayfish purchased from their value of crayfish sales and net margin was calculated by subtracting the total marketing cost of crayfish from the gross margin (Muhammad et al., 2013). Therefore,

$$GM_i = SP_i - PP_i \quad (6)$$

$$NM_i = GM_i - TC_i \quad (7)$$

The gross and net marketing margin percentage of selling price of crayfish were calculated respectively for each intermediaries using the marketing margins model expressed in percentage as (Olukosi et al., 2005):

$$\text{Gross Margin\% (GM}_i) = \frac{\text{Selling Price (SP}_i) - \text{Purchasing Price (PP}_i) \times 100}{\text{Selling Price (SP}_i)}$$

(8)

$$\text{Wholesaler Marketing Margin} = \frac{\text{Wholesale selling price} - \text{Wholesale purchase price}}{\text{Wholesale selling price}} \times 100 \quad (9)$$

$$\text{Retailer Marketing Margin} = \frac{\text{Retail selling price} - \text{Retail purchase price}}{\text{Retail selling price}} \times 100 \quad (10)$$

$$\text{Net Margin\% of SP (NM}_i) = \frac{\text{Selling Price (SP}_i) - \text{Total Cost (TC}_i)}{\text{Selling Price (SP}_i)} \times 100 \quad (11)$$

Where;

GM_i = Gross margin (Naira/kg)

TC_i = Total cost (accept value of crayfish purchased in Naira/kg)

NM_i = Net margin (Naira/kg)

i = for wholesale and retail market respectively

RESULTS AND DISCUSSION

Table 2 shows that female traders are predominate in the crayfish market for both retailers (96.30%) and wholesalers (100%) in the study area. The dominance of female in crayfish marketing is justified due to the fact that crayfish marketing is less risky and energy demanding but requires more time and patience. An average age of 32 years shows that the traders are relatively young based on (WHO, 2003) average life span 42 years for Nigeria. The average age of traders was regarded as economically active, self-motivated and innovative age (Yunusa, 1999). Majority (76.32%) of the crayfish traders were married, 21.05% of the respondents were single and only 2.63% were widowed. Married people are believed to shoulder more

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responsibilities than single people, therefore they were more committed to their businesses in order to generate more money to cater for their families, thus implies that crayfish traders would take their business seriously. The results from Table 1 show that majority (97.37%) of the crayfish trader possess at least a formal education and having between 1 - 28 years marketing experience (Table 2). According to Kainga and Kingdom (2012), the ability to read and write improves their access to information vital for profitable marketing activities. An average of 8 years marketing experience indicated that majority of the traders had acquired a substantial experience over their years of engagement in marketing activities. This implies that crayfish traders are knowledgeable enough to manage their businesses very well for high profitability and efficiency. This finding is similar to that of Umoinyang (2014) and Kainga and Kingdom (2012) that suggested that a lengthy period in crayfish marketing indicated that traders involved had used a greater part of their active life in marketing which could culminate to increased profitability for them. The household size of the respondents ranged from 4 - 13 persons with an average of 6 persons. Large household size could favour crayfish marketing because it is highly subsistent and labour intensive in performing the buying, processing and packaging. However, a large household size could put the traders in undue pressure to cater for such household. 81.58% of the total crayfish traders sourced their funds from personal savings, 7.89% of the respondents obtained funds from family and friends and through esusu/money lenders, 1.32% of the crayfish traders obtained finance through Co-op/NGO and banks respectively. This finding implies that there is grossly inadequate external financial assistance in form of loans for the traders especially from formal lending sources. This results corroborate with Kainga and Kingdom (2012) that crayfish traders operate informal financial sector, with majority of them depending on personal savings.

Three (3) dominant crayfish marketing channels were identified which is consistent with the findings of Kainga and Kingdom (2012). The purchase price and selling price of crayfish at each node of the chain are indicated in Figure 1 to illustrate the marketing margins flow across the chain as crayfish moves from the producers to the final consumer. Although, during market survey it was observed that beach and/or market price of crayfish is not fixed at uniform level. The price crayfish at the beach is less than the wholesale and retail price. It was shown that wholesalers either purchase directly from crayfish-harvesters (producers) at an average of N987.78/kg or through local assemblers who charged commission per bag they helped to purchase and sell crayfish at an average of N1,279.90/kg to either the retailers or consumers. The retailers who purchase crayfish at an average of N1,280.10/kg after inclusion of some expenses from the wholesalers sell at an average of N1,834.43/kg to consumers. The increase in selling price of the wholesale and retail price is due to the higher marketing cost such as market levy, transportation, storage, packaging, handling cost e.t.c. Consequently, the wholesale and retail marketing margin has a direct relationship with the prices respectively, where an increase in the wholesale or retail price will lead to an increase in the marketing margin automatically.

Marketing cost and margins of crayfish

The traders' gross margins and net margin were evaluated in relation to the consumer price of the crayfish, that is marketing margin was calculated using the percentage final weighted mean of selling price of each intermediary. In a competitive and efficient market, the marketing margin covers the marketing cost incurred in transporting the produce from one intermediaries to another and provide a reasonable return farmers and middlemen.

In Table 3, gross and net marketing margins were calculated using the selling prices and purchase price at the different levels of the marketing channel and costs incurred in marketing crayfish. Overall, the marketing margins of wholesalers were lower than that of retailers. This was probably based on the marketing costs incurred by the wholesalers, it was evidenced that wholesalers' transportation cost is the highest with the mean value of N18.33/kg, this is due to the fact that most wholesalers travel several kilometers into fishing communities with speed boats to buy crayfish from crayfish-harvesters, thereby increasing their variable cost. The cost outlays in retail crayfish marketing indicated that the highest single cost was market levy which was estimated as N6.93/kg. High market levy is due to the characterized multiple tax structure in the market which was perpetrated by Local Government revenue agents, youth leaders and security agents. The incidence of such unwholesome levies is often transferred to the consumers, since they have to pay more than expected. The average net margin value per kilogram of crayfish of 16.84% and 28.93% for wholesalers and retailers respectively This agreed with Obasi and Nzeakor (2016) and Ani et al. (2016) that produce wholesalers usually spent the highest amount in marketing than other groups probably due to long distances involved in conveying agricultural produced from the farm gates to the markets leading to high transport costs, costs of booking at markets and payment of tax and produce levies at road blocks. All these variables contributed to high cost incurred by wholesalers in the business.

Challenges encountered by crayfish traders

The issues experienced as detailed in Table 4 by the wholesalers and retailers (73.68%) were unavailability of financial assistance whatsoever, this they alleged limited the size of their marketing activities and volume of trade, also lack of storage facilities (68.42%), inadequate storage facilities for crayfish not sold after marketing (57.89%), and high transportation cost (41.77%) were another critical factor that limits marketing volume.

CONCLUSION AND RECOMMENDATION

Based on the findings of the study, the following conclusions were drawn:

Retailers earned higher net marketing margin than wholesalers, which is as a result high cost incurred by wholesalers in the transportation, acquisition and sorting of crayfish from the crayfish-harvesters at beach and/or markets. Most traders sell their product according to the routing price in the market irrespective of the costs incurred. In order to solve the problem of financial inadequacy facing both wholesalers and retailers, both formal and informal financial institutions should be encouraged by the government to provide financial assistance which is in line with the findings of Kainga and Kingdom (2012).

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APPENDIXES

Table 1: A breakdown of sample selection of crayfish traders for the study

Selected LGAs	Total Number of Registered LGAs	Selected	Selected trader per district
Andoni	155		20
Asari-toru	76		10
Akuku-toru	74		10
Port Harcourt	120		15
Obio/akpor	79		10
Ahoada West	116		15
Total	620		80

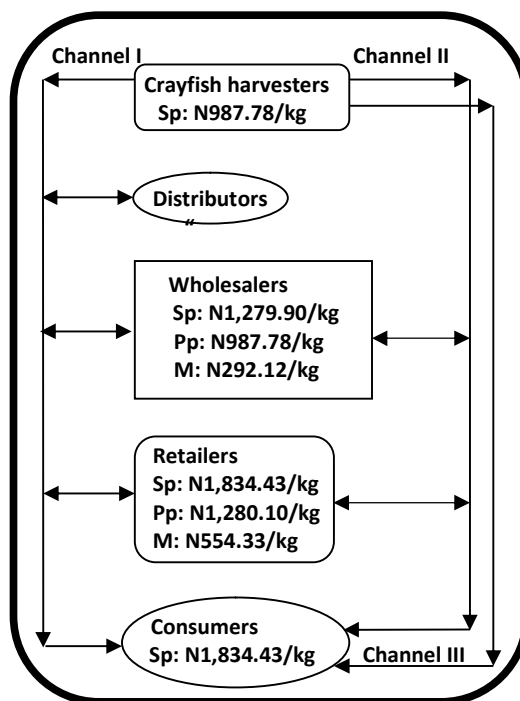
Source: Field Survey Data, 2018

Table 2: Distribution of socioeconomic characteristics of respondents

	Retailers		Wholesalers		Pooled	
	Freq.	%	Freq.	%	Freq.	%
Gender						
Male	1	3.70	0	0.00	1	1.32
Female	26	96.30	49	100.00	75	98.68
Marital Status						
Single	1	3.70	15	30.61	16	21.05
Married	26	96.30	32	65.31	58	76.32
Widowed	0	0.00	2	4.08	2	2.63
Age (years)						
20 – 25	0	0.00	7	14.29	7	9.21
26 – 31	13	48.15	17	34.69	30	39.47
32 – 37	4	14.81	19	38.78	23	30.26
38 – 43	6	22.22	5	10.20	11	14.47
44 – 49	4	14.81	1	2.04	5	6.58

Mean	33.74		31.4		32.07	
Educational Status						
No formal education	2	7.41	0	0.00	2	2.63
Adult Education	0	0.00	2	4.08	2	2.63
Primary Education	9	33.33	22	44.90	31	40.79
Secondary Education	15	55.56	25	51.02	40	52.63
Tertiary Education	1	3.70	0	0.00	1	1.32
Marketing Experience (years)						
1 – 8	16	59.26	28	57.14	44	57.89
9 – 16	8	29.63	19	38.78	27	35.53
17 – 24	2	7.41	1	2.04	3	3.95
25 – 32	1	3.70	1	2.04	2	2.63
Mean	9.11		8.06		8.43	
Household size (no of people)						
1 – 4	4	14.81	1	2.04	5	6.58
5 – 8	16	59.26	43	87.76	59	77.63
9 – 12	6	22.22	5	10.20	11	14.47
13 – 16	1	3.70	0	0.00	1	1.32
Total	27	100.00	49	100.00	76	100.00
Mean	7		6		6	
Source of funds						
	Freq.	%	Freq.	%	Freq.	%
Personal savings	16	59.26	46	93.88	62	81.58
Borrowing from family/friends	3	11.11	3	6.12	6	7.89
Co-op/NGOs	0	0.00	1	3.70	1	1.32
Esusu/Money lenders	6	22.22	0	0.00	6	7.89
Borrowing from Banks	0	0.00	1	3.70	1	1.32

Source: Field survey data, 2018



Channel I: Crayfish Harvesters – Distributors - Wholesalers – Retailers - Consumers
 Channel II: Crayfish Harvesters – Wholesalers - Retailers - Consumers
 Channel III: Crayfish Harvesters - Consumers
 Pp, Sp and M are purchase price, selling price and margin respectively

Figure 1: Different marketing channel of crayfish in the study area

Table 3: Estimates of the cost and margins in crayfish marketing

Variables	Retailers (N/kg)			Wholesalers (N/kg)		
	Mean	Max	Min	Mean	Max	Min
Value of Crayfish Sold	1834.43	2200.00	1375.00	1279.90	1450.00	1135.00
Value of Crayfish purchased	1280.10	1475.00	800.00	987.78	1050.00	775.00
Gross Marketing Margin (SP-PP)	554.33	725.00	575.00	292.12	400.00	360.00
%GM (SP-PP/SP)*100	30.22	32.95	41.82	22.82	27.60	31.72
Marketing Cost						
Transport cost	5.81	28.00	13.53	18.33	30.00	1.67
Packaging	0.60	1.25	0.22	1.89	3.8	2
Storage/security levy	5.06	85.00	0.74	9.63	28.00	2.31
Feeding cost on business	3.05	23.33	0.50	9.34	18.33	6.42
Market levy	6.93	40.00	0.00	10.78	60.67	0.31
Shop rent	***	***	***	11.99	50.00	1.67
Handling/Sorting	***	***	***	8.48	20.33	1.54
Depreciated items Cost	0.79	68.74	0.00	7.26	32.00	0.43
Interest on Capital	2.02	3.00	1.17	0.82	1.56	0.35
Total Marketing Cost	24.26	249.32	16.16	78.53	244.69	16.7
Net Margin(GM-TMC)	530.07	475.68	558.84	213.59	155.31	344.3
Net Margin as % of SP(NM/SP)*100	28.90	21.62	40.64	16.69	10.71	30.33
Market Cost as % of NM(MC/NM)*100	4.58	52.41	2.89	36.77	157.55	4.85

Source: Field Survey Data, 2018

*** indicates these are negligible expenses

Table 4: Distribution of respondents based on challenges in marketing of crayfish

Challenges in marketing of crayfish	Retailers		Wholesalers		Pooled	
	Freq.*	%*	Freq.*	%*	Freq.*	%*
Lack of availability of credit for crayfish traders	21	77.78	35	71.43	56	73.68
Inadequate storage facilities of crayfish not sold after marketing	15	55.55	29	59.18	44	57.89
Poor marketing information	7	25.93	4	8.16	11	14.47
Poor infrastructure used for crayfish marketing	17	29.63	11	30.61	28	36.84
Lack of storage facilities	24	88.89	28	57.14	52	68.42
High cost of marketing levy	18	66.67	35	71.43	53	69.74
High transportation cost	10	37.04	23	46.94	33	41.77

Source: Field Survey Data, 2018