ECONOMICS OF *Irvingia* MARKETING IN NJABA LOCAL GOVERNMENT AREA OF IMO STATE, NIGERIA

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Abstract
This study focused on the economics of *Irvingia species* marketing in Njaba Local Government Area, Imo State. A Multi-stage sampling technique was used to select 80 respondents comprising 40 wholesalers and 40 retailers. Descriptive and inferential statistics were used in data analysis. Marketing margins, and efficiency of the respondents were estimated. Results indicate that trade in *Irvingia species* is dominated by females who are married with small house holdings. The trade was found to be profitable. The significant factors affecting net returns on the marketing of *Irvingia spp* directly for the retailers include level of education, marketing experience and age while cost of purchase had an indirect effect on the net returns of *Irvingia spp.* The wholesalers were affected positively by gender, marital status and household size while age and marketing experience had negative effect on the net returns of *Irvingia spp* in the study area. The marketers also faced some problems that constrained their performance. They include factors such as lack of transport, bad road, high transport cost, lack of storage facilities, and seasonal fluctuation in supply and financial difficulties. The study calls for policies aimed at provision of free education to enable them access and process marketing information; appropriate preservation facilities should be provided for the marketers to curb the current rate of post harvest losses during production season Construction of rural road network is essential to reduce cost and difficulties associated with transportation of products; adequate credit facility should be provided for *Irvingia species* marketers. Provision of bulking centers to improve marketing network, bargaining power, information flow and micro enterprise development

Introduction

Irvingia tree is a valuable source of income for West and Central African farmers. The fruits are sold, but by far the most important product is the kernel which fetches a price several times higher than the fruits (Ayuk, 1999). The trade in kernels not only benefits the producers financially, but also generates income for traders (Ayuk, 1999). *Irvingia* kernel markets extend to local, regional and international levels and there is even inter-continental export. *Irvingia spp* is commonly known as the African mango, Dike nut, bush mango or wild mango. Two different species of *Irvingia* have been identified – *Irvingia gabonensis* and *Irvingia wombolu*. Both are very similar, and indeed are often difficult to tell apart from herbarium specimens alone. (Harris, 1996) However, there are characteristics that distinguish the two. Most noticeable is the edibility of the fruit mesocarp of *I. gabonensis*. The kernels of these species also have various local names: In Nigeria, they are known as '*Ogbono*' in Igbo and '*apon*' in Yoruba. (Ladipo. *et al.,* 1996)

The kernels of *I.gabonensis and I.wombolu* are used as oil seeds. Irvingia kernels form an important part of the West and Central African diet, providing carbohydrate and protein (Onyeike, 1995). The kernels are highly valued for the slimy consistency they produce. They are ground with pestle and mortar or on a stone into a paste or cake, which is used as a soup, stew or sauce additive, for flavouring and thickening (Agbo, 1994). Kernels from both *Irvingia spp* are used in soup making. *I.gabonensis* kernels can only be used when fresh since they become too slimy over time. Fat extracted from the

kernels can be used for food applications, such as in margarine or cooking oil, and is also suitable for soap, cosmetics and pharmaceuticals (Ejiofor, 1997).

Cameroon is a major producer, exporting to Gabon and Equatorial Guinea in particular (Ndoye *et.al.,* 1998, Sunderland, 1998). Equatorial Guinea supplies kernels to Gabon (Sunderland 1998, Yemi, 1997). Ayuk *et. al.,* (1999) reported that in West Africa, the main exporters are Cameroon, Nigeria, Liberia and Sierra Leone. The demand for kernel in southern Nigeria alone is around 80,000 tonnes per year (Ndoye, 1997) and Nigeria serves as both a source and destination for trade. Ladipo (1997) reports that export of *Irvingia* products to other continents has already begun. He mentioned that there is sale of processed kernel to the United Kingdom and America and Tabuna (1997) reports on the trade to Europe.

Information about markets, together with the capacity to act upon it, is an important prerequisite for entering and maintaining a hold in new markets. Engagement in the market therefore changes the opportunities and strategies of the marketers. Agricultural produce marketing contributed about 60% of the total value of export between 1960 – 1970 (Alini *et al.,* 1991). It has also been a source of Nigeria's Gross Domestic Product.

According to Njoku and Nwosu (2000), inadequate market information constitutes a problem to the marketers as they are unable to take advantage of favourable opportunities arising from price difference between producing and consuming areas. Marketing therefore, has been greatly affected by the inability of the government to invest in physical marketing facilities such as: processing, storage, packaging and transport facilities. The problem of *Irvingia spp* production, utilization and processing can be connected to poor marketing arrangement which does not give adequate incentives to producers to increase production. The problems of *Irvingia spp* marketing includes lack of improved processing method for *Irvingia* that could add value and increase product selling prices, (Vabi, 1995).

The second issue is the lack of market information, which makes it difficult for the producers to project quantity demanded, which is a function of market price setting (Ndoye, 1998). Lack of storage facilities at the village level makes it difficult for the producers to store the products beyond the peak production seasons (Falconer, 1990, FAO, 2005). Others include poor transport facilities, variation in margins, lack of market research, negligence on the part of the government, price fluctuation, deforestation, activities of middlemen, low price and high cost of purchase and fluctuating prices of *Irvingia spp*.

Although *Irvingia spp* has been a source of income and livelihood to rural farmers, at present, rural farmers are no longer going into production of this product. Thus marketing improvement is believed to be a sure way of encouraging production of *Irvingia spp,* as agricultural marketing and agricultural production complements each other (FAO, 1995). Against this backdrop, the study analyzed the economics of *irvingia* species (*Ogbono*) marketing in Njaba Local Government Area of Imo state, Nigeria

Methodology

The study was conducted in Njaba Local Government Area of Imo State. The local government is predominantly a farming area with almost 80% of its population as peasants and petty traders who trade mostly on finished farm products. The population for this study was made up of wholesalers and retailers. Multi-stage random sampling technique was used in sampling for location and respondents. The first stage involved the selection of 5 towns from the 11 in the Local Government Area. The next stage involved the random selection of 2 villages from each of the 5 towns making a total of 10

villages. Markets with high supplies of *Irvingia spp* were purposively sampled from the 10 selected villages. From each market, 4 wholesalers and 4 retailers were randomly sampled from a list of retailers and wholesalers that were collected from the study area. In all, 80 respondents were interviewed comprising 40 wholesalers and 40 retailers. Descriptive and inferential statistics were used in data analysis. Marketing efficiency models were also used to achieve some of the objectives. Marketing efficiency index was computed following Shepherd Futrel formular (Olukosi and Isitor (1990)). Thus:

$ME = (V/I) - 1$ …(1).

Where:

V = Value added by marketing activities

I = Total marketing costs

The objective on computation of net returns was achieved using profit function.

This was given as:

$\pi = TR - TC$ … (2)

$TC = TFC + TVC$ … (3)

$TR = PQ$ … (4)

Where: π = Profit

TR = Total revenue

TC = Total cost

TFC = Total fixed cost

TVC = Total variable cost

P = Price and Q = Quantity sold.

The factors influencing net returns of *Ivringia spp* marketing was achieved using Ordinary Least Squares (OLS) multiple regression model. The model was explicitly stated as follows:

$Y = B_o + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + B_6X_6 + B_7X_7 + B_8X_8 + e$ … (5)

Where:

y = Net returns of *Irvingia spp* traded (Naira)

$X_1 - X_8$ = Factors that influence net returns of *Irvingia spp* traded.

X_1 = Gender (male -= 1 and female = 0)

X_2 = Level of education in years

X_3 = Age in years

X_4 = Cost of purchase of *Irvingia spp* (₦)

X_5 = Marketing experience in years

X_6 = Marital status (married = 1, others = 0)

X_7 = Household size /number of people living with respondent

X_8 = Transportation cost in Naira

e = error terms

B_o = Intercept

The Objective focusing on the Challenges to *Irvingia spp* marketing was achieved using simple descriptive statistics.

Results and Discussion

Marketing Margin and Marketing Efficiency of *Irvingia Spp*

Table 1 shows the source of *Irvingia spp* marketed in the area of study.

Table 1: Distribution of the Respondent based on Sources of *Irvingia Spp* Sold in the Area

	Retailers		Wholesalers	
Town/state	Frequency	Percentages	Frequency	Percentages
Uli (Anambra)	10	25	12	30
Njaba (Imo)	4	10	4	10
Abakaliki (Ebonyi)	8	20	8	20
Nsukka (Enugu)	6	15	8	20
Ikom (Cross River)	7	17	4	10
Ukwa (Cross Rivers)	5	12	4	10

Source: Field Survey Data, 2016.

The table reveals that majority of the wholesalers and retailers bought from Uli in Anambra state with a percentage of 30% and 25% respectively. Njaba in Imo state has the same number of wholesalers and retailers who buy within the area that is 10%. Abakaliki in Ebonyi state also had equal number of wholesalers and retailers that patronizes the area that is 20%. The remaining retailers bought or sourced their product from Nsukka (Enugu) 15%, Ikom and Ukwa all in Cross River 17% and 12% respectively while for the remaining wholesalers, 20% bought from Nsukka, 10% from Ikom and 10% from Ukwa respectively. From the above table we may conclude that there was even distribution of both wholesalers and retailers among the sources of the product maybe due to proximity or price.

The Marketing Margin and Marketing Efficiency for the Retailers and Wholesalers

Table 2 shows the marketing margin and marketing efficiency for Retailers.

Table 2: Marketing Margin and Efficiency

	Value (₦)	
Item/operation	**Retailers**	**Wholesalers**
Average purchase price per cup and 20kg bag respectively	298.75	33,050
Average selling price per cup and 20kg bag respectively	388.5	35,850
Average return on sales	19,516	229,550
Total variable cost(transport, feeding, cost of purchase)	15,756.25	212,695
Total fixed cost (rent, depreciation)	386.34	460.11
Total costs	16,142.59	213,155.11
➢ Marketing margin for retailers	=23.10	
➢ Marketing margin for wholesalers	=7.8	
➢ Marketing efficiency for retailers	=20.89%	
➢ Marketing efficiency for wholesalers	=7.69%	

Source: Field Survey Data, 2016.

The marketing margin for the retailers is 23.10% and for the wholesalers 7.8%. The margins are high showing market pricing inefficiency. The acceptable marketing margin is 5% for storable products/commodities, (Scarborough and Kydd, 1992). The marketing efficiency for retailers was 20.89% while for wholesalers was 7.69%. The result shows that the retailers are more efficient in marketing than the wholesalers. According to Kohls and Uhl (1980), a higher value of the ratio of efficiency indicates improved marketing efficiency and lower value denotes reduced efficiency. According to Scarborough and Kydd, (1992) also, if the ratio is less than 100%, there is inefficiency in the marketing system. This implies that there is generally inefficiency in the marketing system for *Irvingia Spp* in the study area.

Net Returns from the Marketing of *Irvingia Spp*

Table 3 shows the net returns for retailers and wholesalers. The retailers had a fixed cost of 386.34 which gave 2.39% of the total cost of 16,142.59 and the variable cost of 15,756.25 gave 97.61% of the total cost. For the wholesalers, the fixed cost of 460.11 gave 0.21% and the variable costs of 212,695 incurred by the wholesalers gave 99.79%. This indicates that the variable costs incurred by both retailers and wholesalers are higher than the fixed costs incurred by both. The net returns for the retailers gave 3,373.41 while wholesalers gave 16,394.11 which show that the business is profitable.

Table 3 : Net Returns from the Marketing of *Irvingia Spp*

	Value (₦)	
Item/operation	**Retailers**	**Wholesalers**
Average purchase price/cup	298.75	33,050
Average selling price/cup	388.5	35,850
Total Revenue/ respondent Average return on sale (for all respondents)	19,516	229,550
Total variable cost/ respondent (transport, feeding, cost of purchase)	15,756.25	212,695
Total fixed cost (rent, depreciation)	386.34	460.11
Total costs	16,142.59	213,155.11
➢ Net returns (profit) for Retailers	= 3,373.41	
➢ Net returns (profit) for Wholesalers	= 16,394.89	

Source: Field Survey Data, 2016.

Determinants of Net returns to Retailers

Factors that influence net returns of *Irvingia spp* marketing was achieved using multiple regression analysis. The outcome of the regression analysis is presented in Tables 4 and 5 for retailers and wholesalers in the area of study respectively. For the retailers, the Semi Log functional form was chosen as the lead equation because of the R^2 and Adjusted R^2 values which were higher in that functional form than in the other three. The f-ratio was also highest in that functional form and significant at the 1% level of probability indicating the goodness of fit. The result showed R^2 value of 0.577 indicating that about 57% of the variation in the net returns from the marketing of *Irvingia spp* by retailers is accounted for by variation in the independent variables while the remaining 43% is accounted for by other variables left out or not accommodated in the model, which is the error term. The f-ratio was significant at 1% showing that the regression model has a good fit. The coefficient of level of education, marketing experience and cost of purchase were all significant at the 1% level of probability while transportation cost was significant at the 1% level.

Level of education, marketing experience and transportation cost were significant and positively related to the net returns from the marketing of *Irvingia spp.* by retailers. From the result the level of education has a significant and positive effect on the net returns from the marketing of *Irvingia spp.* Thus it can be inferred that formal education enhances the marketer's abilities to adjust to modern marketing variations (Usman, 2005).When the level of education is high marketers become more enlightened and this promotes the ability to evaluate new market techniques. Transportation cost also showed a positive and significant determinant of net returns. This result although contrary to *a priori* expectation may be because of the inefficiency associated with the marketing of agricultural products as middlemen sometimes add prices arbitrarily.

Marketing experience also had positive and significant effect on net returns implying that the higher the years of experience, the higher the net returns from marketing of *Irvingia spp*. at the retail level. This conforms to *a priori,* expectation.
The cost of purchase has a negative relationship in the regression line which implies that any increase in the cost of purchase will result to a decrease in the net returns from the marketing of *Irvingia spp* at the retail level in the study area.

Table 4: Determinants of Net returns to Retailers

Variables	Linear	Exponential	Semi-log+	Double-log
Constant	3230.261***	8.154***	12208.798***	10.909***
	(3.775)	(32.617)	(2.948)	(8.929)
Gender (X_1)	-383.945	-0.144	-183.393	-0.199
	(-0.894)	(-1.142)	(0.228)	(-0.501)
Education (X_2)	409.971*	0.101*	2036.372***	0.530***
	(1.778)	(1.506)	(3.483)	(3.076)
Age (X_3)	-21.021	-0.007*	-1256.251	-0.386
	(-1.468)	(-1.571)	(-1.366)	(-1.423)
Purchase cost(x_4)	-0.858**	0.000**	-1156.827***	-0.361***
	(-2.056)	(-2.362)	(-2.851)	(-3.013)
Experience (X_5)	77.651**	0.022**	1070.078**	0.313**
	(2.417)	(2.370)	(2.063)	(2.048)
Marital Status (X_6)	229.638	0.054	303.077	0.066
	(1.428)	(1.153)	(0.937)	(0.689)
Household size (X_7)	-25.272	-0.012	-151.773	-0.056
	(-0.327)	(-0.527)	(-0.319)	(-0.399)
Transport cost (X_8)	0.001***	0.000***	318.186***	0.029***
	(4.975)	(4.499)	(4.328)	(3.113)
R^2	0.385	0.382	0.557	0.566
Adjusted R^2	0.250	0.247	0.421	0.406
F-ratio	2.859***	2.828***	3.703***	3.541***

Source: Field survey Data 2016. *** = significant at 1%, ** = significant at 5%
* = significant at 10%, Values in parenthesis are t-ratio, + = lead equation

Determinants of Net returns to Wholesalers

For the Wholesalers, the linear functional form was chosen as the lead equation, based on the number of significant variables and because it has the highest R^2 and R^2-adjusted values and the F-ratio being significant at the 1% level. The result showed R^2 value of 0.896 indicating that about 89% of variation in net returns is accounted for by variation in the independent variables. The F-ratio was significant at 1% showing the overall significance of the regression equation. From the result, gender, household and marital status had significant and positive effect on the net returns on the marketing of *Irvingia spp* in the study area. Gender had positive effect on the net returns, it can be opined that since women are dominant in the market, the market thrives well when managed by women. The household size from the result has a positive effect, which implies that larger household size will add the drive for making profit in order to meet the additional financial needs of the family (Usman, 2005). Marital status has positive effect, it can also be deduced from the research that married people who are involved adapts better in the business. From the result, marketing experience and age have negative relationship on net returns. This implies that any change in marketing experience and age will lead to reduction on the net returns on the marketing of *Irvingia spp* in the study area.

Table 5: Determinants of Net returns to Retailers

Variables	Linear+	Exponential	Semi-log	Double-log
Constant	9.327	238190.710	11.824***	37639.964
	(0.702)	(1.127)	(3.390)	(0.636)
Gender (X_1)	0.681***	9627.237***	0.137**	2629.103***
	(3.147)	(2.798)	(2.383)	(2.704)
Level of education (X_2)	0.057	898.719	0.189	2174.217
	(1.150)	(1.150)	(1.299)	(0.880)
Age (X_3)	-1.538**	-22541.508**	0.003	60.108
	(-3.312)	(-3.051)	(0.799)	(0.823)
Cost of purchase (X_4)	0.789	-9157.823	-4.969E-5	-0.420
	(0.657)	(-0.479)	(-489)	(-0.244)
Experience (X_5)	-1.827***	-29473.380***	-0.053***	-971.008***
	(-5.560)	(-5.138)	(-5.429)	(-5.987)
Marital status(X_6)	1.173**	15927.119**	-0.80	-805.526
	(2.482)	(2.118)	(-1.129)	(-0.671)
Household size (X_7)	1.231**	16621.724**	-0.009	6.150
	(2.650)	2.250	(-0.312)	(0.013)
Transportation cost (X_8)	0.002	4.17E-006	9.671	0.036
	(1.214)	(0.315)	(1.047)	(0.824)
R^2	0.896	0.899	0.855	0.840
Adjusted R^2	0.866	0.870	0.823	0.805
F-ratio	29.610***	30.538***	26.936***	23.975***

Source: Field Survey Data, 2016.

***= significant at 1%

**= significant at 5%

*= significant at 10%

Values in parenthesis are the t-ratios,

+= lead equation

Constraints militating against the Marketing of *Irvingia* in the study area

The problems and prospects of *Irvingia spp* are shown in Table 6.

Table 6: Constraints militating against the Marketing of *Irvingia* in the study area

	Retailers		Wholesalers	
Problems	Frequency	Percentages	Frequency	Percentages
Inadequate transport facilities, bad road and high transport cost	35	16.06	36	18.46
Inadequate storage facilities	37	16.97	34	17.44
Price fluctuations	14	6.42	17	8.72
Seasonal fluctuation in supply	28	12.84	30	15.38
Deforestation	22	10.29	12	6.15
Lack of modern processing technology	13	5.96	8	4.10
Poor quality of products	19	8.71	13	6.66
Financial difficulties	32	14.67	34	17.44
Low capital for the business	18	8.25	11	5.64

Source: Field Survey Data, 2016

Conclusion

The study has been able to examine the economics of *Irvingia species* marketing in Njaba Local Government Area, Imo State. The trade in *Irvingia species* is also found to be profitable with respect to the level of inputs used to the output obtained. The result also shows that variable cost incurred in the business is higher than the fixed cost. The Study recommends thus:

- Marketers should be encouraged to engage in further education programmes such as seminars
- Appropriate preservation facilities should be provided for the marketers as this will go a long way in curbing the current rate of spoilage during production season.
- Construction of rural road network is essential to reduce cost and difficulties associated with transportation of products
- Adequate credit facility should be provided for *Irvingia species* marketers.
- More males should be encouraged to participate.
- There is the need for the establishment of the *Irvingia* trees plantation so as to serve as source of steady supply.
- Organization of the marketers at the local level into groups of cooperators will go along in improving their marketing network, bargaining power, information flow, and micro enterprise development.
- ,marketing experience, cost of purchase, household size, level of education and transportation cost are to be monitored and put into perspective in policy making in order to better the overall efficiency and quality of *Irvingia species* sold.

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