

**SUDANO - SAHELIAN LANDSCAPE
AND RENEWABLE NATURAL RESOURCES
DEVELOPMENT IN NIGERIA**

Proceedings of the

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of the

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held in Minna, Niger State

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CONSUMPTION PATTERN AND DEMAND ANALYSIS OF *Dacryodes edulis* IN UMUAHIA METROPOLIS OF ABIA STATE

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Abstract

Consumption pattern and demand analysis of *Dacryodes edulis* commonly called *ube* by the Igbos in Umuahia, Nigeria was studied. The various uses and reasons for consumption of *Dacryodes edulis*, socio-economic characteristics of respondents, income elasticity, regression of the significance of socio-economic variables on demand for *Dacryodes edulis*, correlation of socio-economic status and consumption are addressed. Simple random sampling was adopted. A well structured questionnaire were used for *Dacryodes edulis* consumers at the household in two selected local government areas in Umuahia. A total of (160) one hundred and sixty questionnaires were administered, on a total of eight (8) villages. Data obtained were subjected to simple descriptive statistics, which shows that almost all the respondents (92.0%) consume *Dacryodes edulis* and they got to know of *Dacryodes edulis* through family and friends due to its high medicinal value as claimed by 91.3% of the respondents. Results indicated a significant descriptive ($P < 0.05$) contribution of the independent variables on the quantity of *Dacryodes edulis* consumed. The coefficient of determination (R^2) which is 58% makes the model fitted well to the data. The marital status has the highest contribution (0.179) to the quantity of *Dacryodes edulis* consumed, this is followed by willingness to buy (0.167), how often (0.137), household size (0.116), age (0.100) educational level (0.099), price of purchase (0.095) and profession (0.068). The income elasticity of *Dacryodes edulis* demand is 13%. The income elasticity is significant at 5% with coefficient of 0.13, this means that a percent increase in income leads to a 13%, of change in *Dacryodes edulis* consumption. The correlation shows that the quantity purchased and how often you buy *Dacryodes edulis* is significant (-0.5807) and also the quantity purchased and price quantity of purchase each time is also significant (0.6440).

Keywords: *Dacryodes edulis*, demand, consumption pattern, elasticity, respondents.

Introduction

Edible non-wood forest products are indispensable to rural people for regular or supplementary food supply and as a source of revenue generation. Farmers and forest dwelling people possess a great deal of indigenous knowledge arising from the utilization of non-wood forest products (NWFPS) and agricultural crops (Okafor, 1983). Multipurpose trees and shrubs (MPTS) have multipurpose functions and provide fuel woods, poles, timber, fruits, gums nuts, fibre, medicine, etc. for the indigenous people (Anonymous (2010).

Plants are primary sources of medicines, fibre, food, shelter and other items of everyday use by humans. The roots, stems, leaves, flowers, fruit and seeds provide food for animals and human beings (Hemingway, 2004,). Plants serve as indispensable constituents of human diet supplying the body with mineral salts, vitamins and certain hormone precursors in addition to protein and energy (Oyenuga and Fetuga, 1975). Seeds have nutritive and calorific values which make them necessary in diets (Odoemelam, 2005; Olowoyo 2012). The fruit called ube by the Igbo's or Elemi in Yoruba are economically and medicinally important (Okafor, 1987; Okigbo, 1977). *Dacryodes edulis* is a traditional food plant in Africa this fruit has potential to improve nutrition, boost food security, foster rural development and support sustainable land care. The main use of *dacryodes edulis* is the consumption of its fruit by the people of Umuahia metropolis in Abia State. The fruit can be eaten raw, cooked in salt water or roasted. Cooked flesh of the fruit has a texture similar to butter. The plantation can produce 7-8 tons of oil per hectare and pulp contains 48% oil. It is also rich in vitamins. In Umuahia, the kernel is being used as fodder for sheep or goats and the flowers are useful in agriculture, NRC (2008).

Consumption is an act of buying and making use of what you buy as quickly as possible before purchasing another one. According to Robinson (1972), demand is the functional relationship between the price of a given commodity and the quantity of that commodity that will be sold in a market specified as to time and place. Also according to Jhingan (2002), demand in its ordinary meaning means desire but it becomes effective when income is spent in buying consumption and investment goods. The essence of the study of demand in economics is to describe the behaviour of consumers. Adegeye and Dittoh (1985), defined demand as a schedule which shows the various amount of a product which consumers are willing to buy and able to purchase at every specific price in a series of time. Demand is classified into individual and market demand. Individual demand is the schedule which shows the various amount of a product which a consumer is willing and able to buy within a particular period of time in a series of possible prices, while a market demand schedule in a particular market can be accomplished by summing the quantities demanded by each consumer at the various possible prices to give the total demand schedule in a particular market (McConnell 1990). Koutsoyiannis (1979) also defined the market demand for a given commodity as the horizontal summation of the individual consumers. Demand is a multivariate relationship, that is, it is determined by many variables simultaneously. Basically the most important determinants of the market demand are considered to be the prices of the commodity in question, the price of other commodities, consumers income, number of consumers in the market, consumers expectation with respect to future prices and income. Keynes in his "General Theory" postulated that aggregate consumption is a function of aggregate disposable income. The relation between consumption and income is based on his psychological law of consumption which states that when income increases, consumption expenditure also increases but by a smaller amount. In other words, the consumption expenditure increases

(or decreases) with increase (or decrease) in income but non-proportionally.

The objective of this study is to determine the factors responsible for the consumption of *D. edulis* and also to determine the pattern of consumption and the various uses and reasons for consumption of *Dacryodes edulis*.

Methodology

The study was carried out in the ancient city of Umuahia, the capital of Abia State. The city is located on the eastern part of Nigeria and lies between latitude 5°N and 7°N of the equator, longitude 7°E and 9°E Greenwich meridian. It comprises of two Local Government Areas (Umuahia North and South) with a total population of approximately 359, 230 (NPC, 2006). A simple random sampling was used in selecting 160 respondents with just 150 valid for analysis during data collection. The data were collected with well structured questionnaires. Descriptive statistics (such as frequency and percentages) and multiple regression models (linear regression models) were used to examine the relationship between quantity of *Dacryodes edulis* consumed and some independent variables. The model is stated thus:

$$Q_1 = A_1 + A_2X_{2i} + A_3X_{3i} + A_4X_{4i} + A_5X_{5i} + A_6X_{6i} + A_7X_{7i} + A_8X_{8i} + U_{8i}$$

Where Q_1 = Quantity of *Dacryodes edulis* consumed

X_1 = Sex of the respondents

X_2 = Age of the respondents

X_3 = Educational qualifications

X_4 = Marital status

X_5 = Profession

X_6 = Household size

X_7 = Price

X_8 = Income

$A = A_1, A_2, \dots, A_8$

U = error term

Results and Discussion

A total of 160 questionnaires were used for this study; but 150 were recovered, from the two local governments. The result of socioeconomic characteristics of respondents is presented in Table 1. Of all the respondents 53.3% are male and 46.7% are female. Approximately 29.3% of them were between ages 36 and 45 years, while 26.7% were between 46 years and above. About 36.0% of the respondents claimed to have primary education and 34% have secondary education. Almost 65.3% of the consuming respondents are married from major Igbo's tribe. Also, from table 1 28.7% and 18.7% of the respondents claimed to be farmers and traders by profession, while 24% are artisan. Almost 96% of the respondents are fully engaged in their profession of family trading

while 1.3 are not. Almost, 47.3% of the respondents have between 0 and 4 household family size while 32% have about 5-8 family size.

Also, 96.0% agrees that *Dacryodes edulis* is available in the market all the time, which means it is easily gotten nearby so the consumption is possibly high. It was found out that both wet season and dry season affect the availability of *Dacryodes edulis* while 76.0% of the respondents agree to these.

About 54% of the respondents are still willing to buy their usual quantity weekly even at scarce season.

Table 1: Socio-economic characteristics of Respondents

Characteristics	Indicators or operationalization	Frequency	Percentage %
Gender	Male	80	53.3
	Female	70	46.7
	Total	150	100.0
Age	15 -25	30	20.0
	26 – 35	35	23.3
	36 – 45	44	29.3
	46 & above	40	26.7
	Total	149	99.3
	Missing system	1	7
	Total	150	100.0
Educational Qualification	No formal education	30	20.0
	Primary education	54	36.0
	Secondary education	51	34.0
	OND/NCE	8	5.3
	Graduate	7	4.7
	Total	150	100.0
Marital Status	Single	32	21.3
	Married	98	65.3
	Widowed	19	12.7
	Single parent	1	7
	Total	150	100.0
Tribe	Igbo	148	98.7
	Missing system	2	1.3
	Total	150	100.0
Profession	Medical	2	1.3
	Solicitor	3	2.0

	Teacher	14	9.3
	Farmer	43	28.7
	Trader	28	18.7
	Driver	20	13.3
	Artisan	36	24.0
	Total	146	97.3
	Missing system	4	2.7
	Total	150	100.0
Household size	0 - 4	71	47.3
	5 - 8	48	32.0
	9 above	27	18.0
	Total	146	97.3
	Missing system	4	2.7
	Total	150	100.0
If yes what is your average annual income	0 - 1 million	134	89.3
	1 - 2 million	7	4.7
	2 - 4 million	1	.7
	4 - 6 million	3	2.0
	Total	145	96.7
	Missing system	5	3.3
	Total	150	100.0
If no what is your other source of income	Farming	142	94.7
	Trading	4	2.7
	Total	146	97.3
	Missing system	4	2.7
	Total	150	100.0
Did you have other source	Yes	13	8.7
	No	133	88.7
	Total	146	97.3
	Missing system	4	2.7
	Total	150	100.0
If you have list them	Farming	138	92.0
	Trading	7	4.7
	Artisan	1	.7
	Total	146	97.3
	Missing system	4	2.7

	Total	150	100.0
Is Ube available in the market all the time	Yes	144	96.0
	No	2	1.3
	Total	146	97.3
	Missing system	4	2.7
	Total	150	100.0
Which season affect the availability of Ube	Wet season	20	13.3
	Dry season	7	4.7
	Beth	114	76.0
	Total	146	97.3
	Missing system	4	2.7
	Total	150	100.0
At scarce season are you still willing to buy your usual quantity?	Yes	81	54.0
	No	65	43.3
	Total	146	97.3
	Missing system	4	2.7
	Total	150	100.0

Source: Field Survey, 2010.

In table 2, almost all the respondents (92.0%) eat *Dacryodes edulis* because of its medicinal value, this finding concurs with the study by Iduma and Tolawo (2009) where it was reported that all respondents eat because of its medicinal value. A large number of people (79.3%) spend about N150.00 weekly on Ube. Most respondents (77.3%) claimed to know Ube through friends and family, and 85.3% of the respondents enjoy the fruit being roasted. At each purchase, 44.7% of respondents bought 15 pieces of Ube.

Almost all the respondents (99.3%) are willing to buy more *Dacryodes edulis* fruit, even if there is a price increase they still agree to buy their usual quantity. About 95% of the entire household consume Ube which has market as its source. The major commercial importance of *Dacryodes edulis* is the potential to increase nutrition (99.3%). i.e. for balance diet. The consumption pattern and demand analysis study confirms and builds on previous studies (Ndoye *et al.*, 1997; Tabuna, 2000),

Table 2: Consumption Pattern of *Dacryodes edulis* by the Respondents

Did you eat the fruit	Yes	138	92.0
	No	11	7.3
	Total	149	99.3
	Missing system	1	.7
	Total	150	100.0
Reasons for consuming Ube	Cheapness	10	6.7
	Sweetness	3	2.0
	Medicinal value	137	91.3
	Total	150	100.0
How did you get to know Ube	Thru friends & family	116	77.3
	Personal likeness/choice	33	22.0
	Thru. Medical practice	1	.7
	Total	150	100.0
	How best did you enjoy this fruit	Per boil	2
Roasted		128	85.3
With maize or yam		15	10.0
All of the above		5	3.3
Total		150	100.0
How often do you buy this fruit	Daily	6	4.0
	Weekly	119	79.3
	Often	8	5.3
	Seldom	14	9.3
	Total	147	98.0
	Missing system	3	2.0
	Total	150	100.0
What is the price of your purchase each time	N20 -50	22	14.7
	N60 -100	15	10.0
	N100 - 200	79	52.7
	N210 - 300	31	20.7
	Total	147	98.0
	Missing system	3	2.0
	Total	150	100.0

Quantity purchased at each buying	3 pieces	31	20.7
	6 pieces	1	.7
	10 pieces	13	8.7
	15 pieces	67	44.7
	20 pieces	34	22.7
	Total	146	97.3
	Missing system	4	2.7
	Total	150	100.0
Willingness to buy more Ube Fruit	Yes	149	99.3
	Missing system	1	.7
	Total	150	100.0
With price increase are you still willing to buy your usual quantity	Yes	149	99.3
	Missing system	1	.7
	Total	150	100.0
If the price goes down are you willing to buy more	Yes	130	86.7
	No	20	13.3
	Total	150	100.0
Number in the household that consume Ube	All	142	94.7
	Some	8	5.3
	Total	150	100.0
Source of Ube	Farm field	6	4.0
	Market	143	95.3
	Own garden	1	.7
	Total	150	100.0
Commercial Importance of Ube	Potential to increase nutrition	149	99.3
	It boost food security	1	.7
	Total	150	100.0

Source: Field Survey, 2010.

Table 3 shows the cross-tabulation analysis result of consumption of Ube and socioeconomic variables. It can be discovered that consumption of Ube depends on the

source of Ube, number in the household that consume the fruit, ($P < 0.05$). The result therefore implies that increase in the price of Ube will lead to decrease in the quantity demanded, which is the expected situation in any purchase of goods and services. On the other hand, consumption of Ube does not have any correlation with variables such as gender, age ($P > 0.05$).

Table 3: Effect of Selected Variables on Consumption of *Dacryodes edulis*

	Chi-Square	P-Level	
Which season affect the availability of Ube	31.699	0.000	Significant
At scarce season are you still willing to buy your usual quantity.	5.930	0.015	Ns
Consumption Motive	134.482	0.000	Significant
Awareness	41.749	0.000	Significant
How best did you enjoy this fruit	0.614	0.893	Ns
Frequency of Purchase	43.283	0.000	Significant
What is the price of your purchase each time.	2.790	0.425	Ns
Source of <i>Dacryodes edulis</i>	43.772	0.000	Significant
Willing to buy more Ube fruit– this is a constant.			
If the price of Ube increase pieces are you still willing to buy your usual quantity			
If the price goes down are you willing to buy more Ube.	37.561	0.000	Significant
Source of Ube	32.170	0.000	Significant
Commercial importance of Ube	0.080	0.777	Ns

Significant Regression Model

$$\text{Qty. Consumed} = 0.905 + 0.165X_1 + 0.095X_2 + 0.137X_3 + 0.116X_4 + 0.068X_5 + 0.179X_6 + 0.099X_7 + 0.100X_8$$

$$R^2 = 57.8\%$$

$$p = 0.0000$$

$$X = \text{Significant } 0.05 \text{ P – Level}$$

$$\text{SEE} = 0.95$$

Equation 1 presents the model developed from this study. There is a significant ($P < 0.05$) contribution of the independent variables (X_1 to X_8) on the quantity of Ube consumed. As it can be observed from the coefficient of determination (R^2), which is about 58%, the model fitted well to the data. The marital status (X_6) with regression co-efficient (0.179) with Willingness to buy X_1 with regression co-efficient (0.167) are more pronounced factors (weak) that affect the consumption of *Dacryodes edulis* in the Umuahia metropolis. It can also be seen that these two factors (X_1 and X_6) to a reasonable measure affect the consumption of *Dacryodes edulis* and should be seen as major factors that affect the consumption of *Dacryodes edulis* in Umuahia metropolis among others.

Correlation between socioeconomic variables

Table 4 presents the correlation result from the study. It is observed that the quantity purchased (2) and how often you buy this fruit is significant (- 0.5807). Also the quantity purchased and price quantity of purchase each time is also significant (0.6440).

Table4: Correlation result

Corr q⁷ age educqms prof hs q⁵ q⁶ q⁸

	q ⁷	Age	Edu	Ms	prof	Hs	q ⁵	q ⁶	q ⁸
q7	1.0000								
Age	0.1290ns	1.000							
Edu	-0.0078	0.290	1.000						
Ms	0.1099ns	0.619	0.209	1.000					
Prof	0.1099ns	0.173	0.418	0.284	1.000				
Hs	0.0543ns	0.316	0.205	0.266	0.123	1.000			
q5	0.5807*	0.022	0.097	0.056	0.020	0.100	1.000		
q6	0.6440*	0.128	0.063	0.128	0.057	0.073	0.382	1.000	
q8	0.1401ns	0.117	0.041	0.019	0.113	0.008	0.059	0.108	1.000

*=significant (p<0.05)

ns= not significant (p>0.05)

Income Elasticity

The income elasticity of Ube demand is 13%. Income elasticity is significant at 5% with coefficient of 0.13, this means that a percent increase in income leads to a 13% change in Ube consumption. Expenditure elasticity is significant at 5% with a negative coefficient of 0.07, this means that a percentage increase in price of Dacryodes edulis leads to a 7% decrease in its consumption.

The possible reasons for the pasture of the results are distributing of earners. From table one it shows that 89.3% of the respondents have 0-1 million naira as their average annual income. So Dacryodes edulis in this sense is considered as a luxury which is consumed only when they have money.

Conclusion and Recommendation

The study provides evidence of a thriving domestic market for *Dacryodes edulis* in Umuahia as well as valuable Nigeria import market. The result showed that the quantity purchased and price quantity of purchase of *Dacryodes edulis* each time is positively related to the demand for *D. edulis* by household. It was also discovered that people consume the fruit majorly because of its medicinal value. A percent increase in income leads to a 13% change in *Dacryodes edulis* consumption. The price of *Dacryodes edulis* varies with the characteristics desired by the market. The key constraint to *Dacryodes edulis* is perishability and overcoming would help to increase both the domestic and international market. Perishability makes marketing intensity more certain and places a premium on good infrastructure (including cold storage chains for high value marketers) and market information priority should therefore be given to research into storage and processing methods for *Dacryodes edulis*. All these enhance consumption. The fruit would however have to meet the expectations of current consumers and the requirements of raw outlets, such as generated large – scale supplies frozen fruit and *Dacryodes edulis* paste may be possible innovations. It is also recommended that Forestry Research Institute Nigeria should perfect more research on the propagation and mass production of this specie to reduce importation from the neighbouring countries.

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