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Cowpea Marketing and Consumer Preference in Magama Local Government Area of Niger State, Nigeria

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ABSTRACT

To study the economic analysis of cowpea marketing in Magama Local Government area of Niger state, a multistage sampling technique was used involving a total of 80 respondents. Data was sourced primarily through a market survey and analyzed descriptively using percentages and frequencies. Also the ordinary least squares regression analysis was used. Results revealed that 89.24% of respondents were male; mean age was 43 years and also a mean household size of six persons. Arabic education was the highest revealing 28.75%. A demand function for cowpea was $Q=-33258.695 + 0.003X_1 + 0.202X_2 + 3.342X_3 + 4647X_4 – 8897.008X_5$. Results of own price elasticity revealed that cowpea was an inelastic good. The income elasticity revealed cowpea as a necessity in the study area, while the cross price elasticity revealed that bambara-nut was a close substitute to cowpea in the study area. Results revealed a decentralized marketing channel, and the problems were mainly inadequate credit and high cost of transportation. Consumers in the study area had a high preference for white cowpea cooked with rice and also preferred larger cowpea grain size over the smaller. Marketers were advised to form cooperative bodies and be fully integrated into such to better facilitate the acquisition of funds. It was also recommended that the Local Government should construct local feeder road network to facilitate transportation. © 2011 Friends Science Publishers

Key Words: Cowpea marketing; Consumer preference; Own price elasticity; Cross price elasticity; Income elasticity; Demand function

INTRODUCTION

Cowpea (*Vigna Unguiculata)* is a major legume crop grown in many parts of Nigeria. Much of its production takes place in the savanna region of the country, in which Niger state is inclusive. Cowpea is an important stable food and affordable and a cheap protein source to rural and urban dwellers.

Cowpea is widely grown in most parts of Niger state, with Magama local Government as one of the predominant areas of production. Domestic production of cowpea in the study area is in the hands of small scale farmers, who obtain low yields due to subsistence level of production usually characterized by lack of improved technologies, inputs and agronomic practices.

Langyintuo *et al.* (2003) reported that the largest cowpea exporting country in the region and in the world is Niger. Nigeria is the largest cowpea producer in the world with an annual production of almost 1.7 million metric tones in the 1990's (Lunborg, 1986; Langyintuo *et al.,* 2003). In many regions cowpea marketing is primarily done by women, examples abound in the humid coastal areas of

Ghana, Togo and Benin. This is also evident from the study of Langyintou (2004) that 100% of cowpea retailers are women. In the study area there is a reflection of both men and women involved in cowpea marketing. Marketing of cowpea remains one of the most lucrative businesses engaged in by most agric produce merchants because of the high economic value of the crop. There is usually a high economic return on the marketing of cowpea because of its value in the diet of most consumers. It also serves as a cheap source of plant protein to most homes in the face of seemingly high cost of animal protein. The emerging picture of cowpea marketing in West Africa is one of well established hierarchical trade link, especially between Nigeria and its neighbours (Langyintuo, 1999; Lowenberge-Deboer & Coulibaly, 2000; Faye, 1999, 2000). The largest cowpea market in the world is Dawanau market in Kano in Northern Nigeria. The cowpea marketing consists of traders and markets that ensure a movement of grain from rural markets to urban wholesaler markets and finally to consumer markets. One of the advantages of cowpea is that its seed can be stored for use throughout the year, whilst a major disadvantage is that cowpea grain is prone to insect

damage. In the study area cowpea marketing is affected by problems such as inadequate credit to facilitate for effective marketing, inadequate supply of cowpea meeting very high demand, undefined market linkage, no specific and consistent market channel, high cost of transportation and poor road network. As a result of these problems highlighted, this study was aimed at indentifying to what extent the market channel has affected cowpea marketing and to what extent has the cowpea supply being able to address the demand in the study area followed by economic analysis of cowpea marketing in the area.

MATERIALS AND METHODS

The study was carried out in Magama Local Government Area of Niger state. Niger state lies between latitudes $8^0 21^'$ and $11^0 30^'$ and longitudes $3^0 30^'$ and $7^0 20^'$. It is situated in the middle belt zone of Nigeria and is indispensably one of the largest fertile agricultural lands in Nigeria covering about 8,733,170 km^2 of the total land area of the country. The area has a tropical climate marked by wet and dry seasons. The inhabitants are mainly Kamuku's Kambari's Dakarkari a small fraction of Nupes, Kakanda, Gwaris, Igbos, Yoruba's and semi sedentary Fulani. The study focused on cowpea marketing and consumer preference. Sampling procedure involved a multistage sampling technique in which firstly, four district areas were purposely selected due to the prevalence of cowpea maketing in the areas. Secondly two villages were selected from each district area giving a total of eight villages. This is seen in Table I. Thirdly, 10 markets made up of wholesalers, retailers and producers were selected from each village making a total of 80 respondents as the sampling frame. The nature and type of markets is given by Table II. To identify consumption pattern and consumer preference of cowpea a total of 150 households were interviewed. Data was collected after the 2008 cropping season from April through to January 2009. Data was sourced primarily through well structured questionnaire. Analysis of data was done through descriptive statistics and regression analysis.

Data analysis and modeling: The regression model was used to examine the relationship between quantity of cowpea demanded and some variables stated below:

$$Qd = F(X_1, X_2, X_3, X_4, X_5, e)$$

Where,

X_1 = Income of the consumer per month (N).

X_2 = Average price of cowpea demanded in (N).

X_3 = Average price of bambara nut as a substitute to cowpea (N).

X_4 = Household size (in numbers).

X_5 = Taste (1 for high taste & 0 otherwise).

E = Error term.

Income elasticity Ey:

$$EY = \frac{\partial \theta}{\partial y} \times \frac{\bar{y}}{\bar{\theta}}$$

Where,

Ey = income elasticity of cowpea.

$\partial \theta$ = change in quantity of cowpea demanded.

∂y = change in income of consumers.

$\bar{y}$ = geometric mean income of consumers.

θ geometric mean of cowpea demanded.

Cross price elasticity Exy:

$$Exy = \frac{dy}{dx} \times \frac{\bar{P}}{\bar{x}}$$

Where,

Exy = cross price elasticity of demand.

dy = coefficient with respect to income of consumers.

dx = coefficient with respect to substitute good (Bambara nuts).

$\bar{y}$ = geometric mean of income of consumers (N).

$\bar{x}$ = geometric mean price of substitute good (N).

Price elasticity of demand (Ep):

$$EP = \frac{\partial \theta}{\partial y} \times \frac{\bar{p}}{\bar{\theta}}$$

Where,

Ep = price elasticity of demand (N).

$d\theta$ = change in quantity demanded of cowpea.

dy = change in price of cowpea N.

$\bar{\theta}$ geometric mean of quantity demanded.

$\bar{p}$ = geometric mean of price of cowpea N.

RESULTS AND DISCUSSION

The results in Table III revealed that 89.24% of the respondents were male. This reveals that in the study area, the male gender is the highest participants in cowpea marketing. This is contrary to findings by Langyintuo (2004), who revealed 100% female as the highest cowpea retailers in the humid coastal areas of Ghana, Togo and Benin republic. However, Musa (2003) reported that only seven women in over hundred (100) observations were involved in cowpea trading. The study also revealed that 83.75% of the respondents fall within the age group of 26-47 years of age. These distributions indicated that the youths and middle aged are highly involved in cowpea marketing. They are quiet energetic and active and are able to deal with exigencies of travel and movement from market to market with regards to cowpea marketing. The mean age of respondents involved in cowpea marketing in the study area was 43 years. This is in line with studies carried out by Adejobi (2005) who revealed that the market trader groups in his study in Maiduguri were within the age range of 32 and 42 years. The mean household size was six persons, the study area revealed a spread in the level of education with Arabic education being the highest at 28.75% followed by primary and secondary school at 18.7% each.

Table I: Sampling technique

District Area	Villages
1. Salka District	Salka and Kura
2. Nasko District	Nasko and Libale
3. Ibelu District	Ibeto and Yangalu
4. Auna District	Tungan Jika and Sabongari sarkawa

Table II: Nature of markets

Villages	Nature of market
Salka	Urban Market
Kura	Rural Market
Nasko	Rural Market
Libale	Rural Market
Ibeto	Urban Market
Yangalu	Rural Market
Tungan gika	Urban Market
Sabongari sarkawa	Semi urban Market

Table III: Socio-economic characteristics of respondents

Gender	Frequency	Percentage
Male	69	89.24
Female	11	13.75
Total	80	100
Age		
< 25	3	3.75
37- 47	33	41.25
48 and above	10	12.25
Total	80	100
Household Size		
1-10	41	51.25
11-20	39	48.75
21 and above		
Total	80	100
Educational Status		
No formal Education	14	17.5
Primary education	15	18.75
Adult literacy	4	5
Secondary education	15	18.75
Bible school	3	3.75
Arabic school	23	28.75
Tertiary education	6	7.5
Total	80	100

Source: Market survey data 2009

Table IV: Ordinary least squares estimates for factors affecting demand for cowpeas in Magama Local Government Area

Variable	Regression coefficient	T-Values	R^2
Constant	-33258.695	- 1.260	0.551
Income (N) (X_1)	0.003	2.486**	
Price of cowpea (N) (X_2)	0.202	0.247	
Price of substitute (N) (X_3)	3.342	1.166	
Household size (N) (X_4)	4647.068	5.183***	
Taste (N) (X_5)	-8897.008	-2.017**	

Source: Market survey data 2009
Note: ***, **, * implies statistical significance at 1%, 5% and 10% respectively

Demand relations of cowpea marketing: Demand is affected by the level of income of the consumers, the price of the commodity, the price of substitute good, taste and preference of the consumer etc (Olukosi *et al.*, 2005). Table

IV reveals the ordinary least square estimates of factors affecting the demand for cowpea in Magama Local Government Area. The results indicated that income of the consumers, household size and taste were factors that significantly affected cowpea demand in the study area. The estimated regression coefficient for income was 0.003 positive and statistically significant at 5%. Taste was also significant at 5% but negative with a coefficient of -8897.008, this however reveals an inverse relationship between quantity of cowpea demanded and taste. Household size was positive with a coefficient of 4647.06 and statistically significant at 1%. The results from the study area revealed the following demand function for cowpea.

$$Q=33258.695+0.003X_1+0.202X_2+3.342X_3+4647X_4+8897.008X_5$$

Own Price Elasticity,
Given by:

$$EP = \frac{\partial \theta}{\partial y} \times \frac{\bar{p}}{\bar{\theta}}$$

Ep = 0.202 x $\frac{8,256.0375}{18,160}$ = 0.0918.

The study revealed an own price elasticity of 0.0918, which is less than 1. This implied that consumers respond less proportionately to changes in the price of cowpea also the result reveals that cowpea is an inelastic good in the study area.

Income elasticity of demand,
Given By:

$$EY - \frac{\partial \theta}{\partial y} \times \frac{\bar{y}}{\bar{\theta}}$$

Ey = 0.003 x $\frac{1,412,355.6}{18,160}$ = 0.233.

The results of the study revealed an income price elasticity of 0.233, which is less than one. This implies that cowpea is a necessity (necessary good) in the study area.

Cross price elasticity,
Given by:

$$EXY = \frac{d\theta}{d\theta} \quad X \quad \frac{\bar{p}}{\bar{Q}}$$

3.342 x $\frac{8,892,625}{1,453,800}$ = 0.0205.

The cross price elasticity for cowpea in the study area was 0.0205 and is positive. This implies that bambara nut is a substitute product to cowpea in the study area.

Marketing channel: The cowpea value chain consists of marketers that ensure a movement of grain from rural market to urban wholesale markets and finally to consumer markets. The cowpea value chain begins with production of cowpea by small scale farmers throughout West Africa. In sahelian countries of Niger, Boukinafasso and Mali and in the inland areas of coastal countries, farmers typically sell their marketable surplus grain to rural assemblers, who in

Table V: Consumption pattern of cowpea by consumers

Forms of cowpea	Frequency	Percentage
White cowpea alone	17	11.33
Brown cowpea alone	12	8
White cowpea with rice	34	22.6
Brown cowpea with rice	21	14
Green beans with rice	-	-
Cowpea for moi-moi	16	10.33
Cowpea for kosai	18	12
Cowpea for dumplings(danwake)	12	8
Cowpea for soup	13	8.6
Cowpea pudding	7	4.66
Total	150	100

Table VI: Problems of cowpea marketing in the study area

Problems	Frequency	Percentage
Inadequate credit	38	47.5
Bad roads and high cost of Transportation	22	27.5
Robbery/Theft	6	7.5
Inadequate storage and Processing facilities	10	12.5
Poor market facilities	4	5
Total	80	100

Source: Market survey data 2009

Fig. 1: Cowpea distribution channel in Magama Local Government Area of Niger State
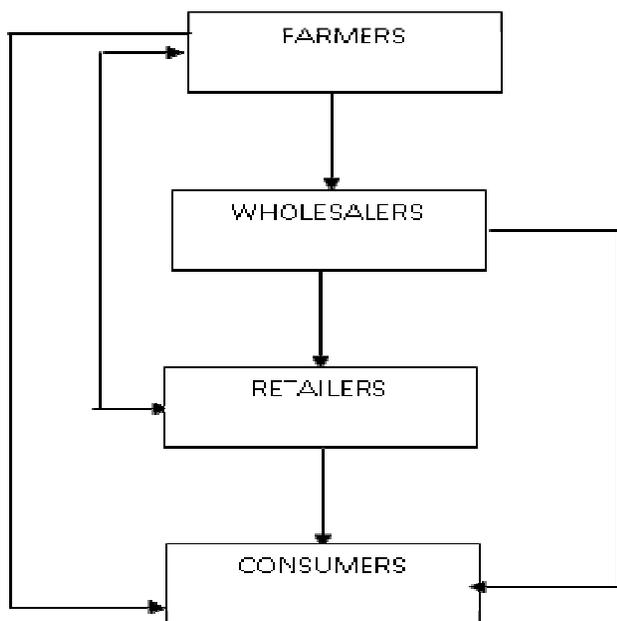
turn sell to urban wholesalers directly through commission agents (Langyintuo *et al*., 2003). Data revealed that farmers (producers) sell their grain to any category of marketers either wholesalers, retailers or consumers (Fig. 1). Adejobi (2005) said that farmers are the starting link in the cowpea market, they sell their product in small quantities (mudu or small bags). Musa (2003) further described the grain retailers as those who buy grain from farmers or merchants and resell to consumers generally in an open traditional market.

Consumption pattern of cowpea by consumers: Table V shows that 22.2% of consumers studied prefer to consume white cowpea with rice, another 14% prefer the brown cowpea with rice, 12% preferred cowpea for preparation of kosai (akara). The findings from this study is in contrast with findings by Kormawa *et al*. (2000) in which brown coloured cowpea grain was preffered by consumers over the white coloured cowpea grain in the Nigerian market studied. This would not be a surprise, because generally, in the study area the brown coloured cowpea commands a higher price and producers prefer to sell them as exports to neigbouring states and countries around, while the white coloured grains are sold in the area of study and locally. This consumption pattern reveals that the income level of consumers, market price of cowpea and its close substitute and the taste of the product are major factors that determine cowpea consumption.

Consumer's preference of cowpea characteristics: The study revealed a higher preference for larger grain sizes of cowpea over the small sized grains by both the consumers and producers alike. This is corroborated by Lowenberge-Deboer *et al.* (2000), in which they reported that consumers almost everywhere in West and Central Africa preferred larger cowpea grain size from extensive studies carried out on cowpea preferences in West and Central Africa.

Problems of cowpea marketing: Table VI revealed that inadequate credit was the highest problem affecting markets followed by bad roads leading to high cost of transportation.

CONCLUSION

Cowpea marketing in the study area is one of a decentralized marketing channel involving the sale of cowpeas from the producers to any category of the cowpea value chain retailers or wholesalers or consumers. The demand relations revealed that income of the consumer's, household size and taste were factors that affected demand for cowpea in the study area significantly. The study area revealed that own price elasticity of cowpeas was inelastic and consumers respond less proportionately to changes in the price of cowpea. The results further revealed that the income elasticity was less than one showing that cowpea is indeed a necessity in the study area. The cross price elasticity of demand revealed that bambara nut was a substitute to cowpea in the study area. The study revealed that consumers had a higher preference for white cowpea eaten with rice and also preferred larger grain sized cowpea over the smaller grains. It is recommended that (1) marketers should form cooperative bodies so that they can properly harness their funds together and also produce a better stand to facilitate acquisition of funds from financial institutions, (2) availability of a good rural/feedder road network from the local government is inevitable and (3) Government security need to be more accessible to the marketers since they are better armed and trained.

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