

Structural Analysis of Yam Markets in Southern Part of Taraba State, Nigeria

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ABSTRACT The study analysed the structure of yam markets in southern part of Taraba state. It specifically identified the degree of product differentiation, market information dissemination and determined the concentration of yam sellers in the markets. A total of 205 respondents comprising of 95 retailers and 110 wholesalers were randomly sampled in 2007/2008 cropping season from three purposively selected yam markets namely, Wukari, Sarkin-Kudu, and Chanchanji yam markets. Simple descriptive statistics, Gini coefficient and Lorenz Curve were the analytical tools used. The common features used in yam differentiation were yam varieties and size or length and market information were disseminated by means of personal contact (verbal message) and telephone (GSM). The Gini coefficient of 0.56 and 0.52 were obtained for wholesaling and retailing respectively. The sellers' concentration was high with high income inequality in yam wholesaling than retailing in the area. The markets, therefore, exhibit features of imperfect markets of monopolistic competition. To reduce high concentration and income inequality among sellers especially in wholesale business, funds, security and physical market facilities should be provided to the yam marketers in the area.

INTRODUCTION

White guinea yam (*Dioscorea rotundata*), which is one of the staple food crops grown in large scale in Taraba State rated as the second largest producing state with about 2,694,000 metric tonnes in 2006 (NBS 2007), has some nutritional and economic relevance to mankind. The tubers are eaten either boiled, roasted, fried and mashed or pounded (Komolafe et al. 2001). In fact, it is acknowledged to be one of the starchy foods which provide an important energy in the tropics (Francis 2001). It is also noted for its contribution to the economy (Asiedu 1999).

Market structure in the agricultural and food sectors has changed fundamentally and rapidly since 1950s in developed and developing countries (in the latter countries usually with a delay of three decades or more) (McCorrison et al. 2004; Reardon and Timer 2005). They stated that it is important to understand the market structure especially the producer-retailer relationship because it helps in analysis of the food chain. Efficient and good marketing system can only operate where there is good market structure and

conduct in place and it is fully utilized (Adegeye and Dittoh 1985).

Adekanye (1977) enumerated that some basic decision needs to be taken on the food market structure that would lead to more effective market performance as (i) perfect competition, (ii) perfect market, and (iii) pricing efficiency. Another important variable in market structure analysis as stated by Okereke and Anthonio (1988) is concentration level which shows the nature of the market and pricing system.

To build a profitable business, food producers seek to establish a preference for their products by differentiating those products in some ways which are meaningful to consumers (Crawford 1997). Methods utilized in order to differentiate a product include branding, advertising, packaging and the altering of the goods' physical characteristics such as colour and accessories.

Market orientation is considered one of the modern powers of growth for the agricultural sector (Okereke and Anthonio 1988). The role of market information is to reduce the level of risk in decision making. Through market information the sellers find out what the consumers need and want.

Therefore, there was a research gap on the yam market structure in the state, particularly in the southern part and the research was designed to fill this gap. This is imperative since

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adequate structured markets and marketing of yam will enhance the activities of the producers and the marketers which variably improve their standard of living.

In view of this, the research was aimed at answering the following questions:

- In what ways is the product (yam) differentiated?
- How is the market information disseminated in the area?
- What type of market structure exists for the product (yam) in the area?

The main objective of the study was to carry out a structural analysis of yam markets in the southern part of Taraba State. Specifically, it aims at to:

- (i) identify the degree of product differentiation
- (ii) identify ways of disseminating market information and
- (iii) determine and describe the concentration of yam sellers in the markets.

MATERIALS AND METHODS

Study Area

The study area is Taraba State, specifically the southern part of the State. The State is located between latitudes 6°30' N and 9°36' N and longitudes 9°10' E and 11°50' E of the Greenwich meridian. It shares common boundaries with six (6) states and Republic of Cameroun (Agboola 1979). It is bounded with Adamawa State (north-east), Bauchi and Gombe States (north), Plateau and Nassarawa States (north-west) and Benue and Republic of Cameroun (south-west).

The state has a tropical climate marked by dry (November – March) and rainy (April – October) seasons. It has an average annual rainfall range between 800 mm to 1950mm and the temperature varies from place to place and ranges between 15°C to 38°C. Taraba State has a total land area of about 60,000 sq km (FOS 1996) and a population of 2,300,736 million persons comprising 1,199,849 million males and 1,100,887 million females (NPC 2006). The state is blessed with natural resources and geographical features, hence often referred to as “Nature’s Gift to the Nation”.

Taraba State has sixteen (16) Local Government Areas namely, Ardo-Kola, Bali, Donga, Gashaka, Gassol, Ibi, Jalingo, Karim-Lamido, Kurmi, Lau, Saruana, Takum, Ussa, Wukari,

Yorro and Zing with Jalingo as the state capital. It is divided into three political senatorial zones as Northern, Central and Southern zones. The southern zone in which the study was carried out comprises of five (5) local government areas namely, Wukari, Ibi, Takum, Donga and Ussa.

Sampling Procedure and Data Collection

Multi-stage, purposive and simple random sampling techniques were adopted in selecting respondents for the study. In the first stage, Wukari, Ibi and Takum Local Government Areas were purposively chosen and studied since commercial yam production and marketing are commonly practised in these areas.

In the second stage, one most popular yam market was purposively picked out of each of the three Local Government Areas selected. These markets were: Wukari main yam market in Wukari, Sarkin-Kudu yam market from Ibi and Chanchanji yam market from Takum Local Government Areas.

Sample frame of the markets were collected and 50 percent of each market frame were randomly selected giving a total of 244 respondents from Wukari, Chanchanji and Sarkin-Kudu yam markets. From the 244 respondents, a total of 205 respondents comprising of 95 retailers and 110 wholesalers properly completed and returned the questionnaires administered to them for the analysis.

Analytical Techniques

Objectives (i) and (ii), product differentiation and ways of information dissemination were achieved using simple descriptive statistics. Objective (iii) was achieved by using Gini Coefficient and Lorenz Curve.

Okereke and Anthonio (1988), Bila and Bulama (2005) used Gini coefficient to determine the degree of market concentration of sellers of grains markets in Eastern Nigeria and Maiduguri Cattle Market respectively by using the formula:

$$G.C = 1 - \sum XY$$

Where

G.C = Gini Coefficient

X = Percentage share of each class or sellers

Y = Cumulative percentage of their sales

The Gini coefficient ranges from zero to one.

A perfect equality in concentration (low) of sellers is expected if G.C tends towards zero, while perfect inequality in concentration (high) of sellers is expected if G.C tends towards one. If G.C =1, market is imperfect and if G.C =0, market is perfect and competitive.

Lorenz Curve was used to give a visualized nature of the sellers' concentration in the markets through a graphical representation. The graph of cumulative percentage of total sales is plotted against the cumulative percentage of the sellers. It is used in economics to describe inequality in income or wealth (Damagaard and Weiner 2000). If all individuals are the same size, the Lorenz Curve is a straight diagonal line (45°), called the line of equality, if there is any inequality in size then the Lorenz Curve falls below the line of equality (45°)

RESULTS AND DISCUSSION

Product Differentiation in the Markets

Table 1 shown that yam tubers in the markets were not considered the same in the eyes of sellers and buyers. This support the definition of product differentiation as given by Olukosi and Isitor (1990) that Product Differentiation means when products look different in the eyes of the consumers.

Table 1: Distribution of respondents by product differentiation

<i>Ways of differentiation</i>	<i>No. of respondent</i>	<i>Percentage</i>
Based on yam bark colour	9	4.39
Based on yam bark texture	10	4.88
Based on yam varieties	105	51.22
Based on yam size/length	81	39.51
Total	205	100.00

Source: Field Survey 2008

Yam varieties and size or length were the common features used in differentiating the produce in the markets with respondents' percentage of 51.22 and 39.51 respectively. Investigation also shows that the common varieties of yam found in the markets were: "MUMUYE, GBONGO, OGOJA, PAPPER and PUNCH". The price attached to yam tubers depend so greatly on the varieties and size or length. This implies that knowing the common features used in differentiating the produce (yam) affects the respondents' income positively.

Source of Market Information in the Area

Table 2 shows the source of information in the markets. It reveals that most of the respondents (73.17 percent) got market information through other marketers such as family members, friends, relatives, neighbours and so on. Other sources of information include transporters/drivers, radio/television and others constituting 13.66 percent, 4.88 percent and 7.80 percent respectively. It has been observed that posters/leaflets (0.49 percent) were not commonly used as means of disseminating market information in the area. The highest percentage of respondents for other marketers as a source of market information could be that potential sellers got detail information of what transpired in the market or other markets without any cost incurred and also timely.

Table 2: Distribution of respondents by source of information

<i>Source of information</i>	<i>No. of respondents</i>	<i>Percentage</i>
Radio / Television	10	4.88
Posters / Leaflet	1	0.49
Transporters/Drivers	28	13.66
Other marketers	150	73.17
Others	16	7.80
Total	205	100.00

Source: Field Survey 2008

Means of Communication in the Markets

Table 3 indicates various means in which market information were passed onto other marketers. The study reveals that verbal message (personal contact) was the most common means of disseminating market information. Another means commonly used was telephone (GSM) with 43.41 percent. This agreed with findings of Bila and Bulama (2005) that information transfer amongst sellers and between sellers and buyers were through personal contact in Maiduguri cattle markets.

Verbal message was commonly used probably because the receivers get detail market information and questions asked were properly answered. Furthermore, in using this means, message obtained are reliable. Telephone (GSM) was also used because most of the areas were covered with different communication networks. In addition, their literacy level of 85.37 percent could be an added advantage for using this means.

Table 3: Distribution of respondents by means of communication

Means of communication	No. of respondents	Percentage
Telephone (GSM)	88	43.41
Written letter	4	1.95
Personal contact (verbal message)	110	53.66
Others	2	0.98
Total	205	100.00

Source: Field Survey 2008

Gini Coefficient Analysis

The result of Gini coefficient analysis shown in Tables 4(a),(b) and 5(a),(b) for retailing and wholesaling respectively indicates high level of inequality in sellers' incomes and hence high level of concentration. Though, there was high income inequality and level of concentration in wholesaling (0.56) than retailing (0.52). This result agreed with the separate studies carried out by Ada-Okungbowa (1998) and Anuebunwa (2002) on yam marketing sellers' concentration in Ondo state and Abia state respectively that there is high degree of inequality in sellers' income and that the markets were highly concentrated.

Table 4(a): Gini coefficient for retailers by monthly sales in Taraba State

Monthly sales range ₦	No. of retailers	% of retailers (X)	Cum. % of retailers
0-17000	1	1.05	1.05
17001-34000	8	8.42	9.47
34001-51000	13	13.68	23.15
51001-68000	14	14.74	37.89
68001-85000	22	23.16	61.05
85001-102000	19	20.00	81.05
102001-119000	15	15.79	96.84
> 119000	3	3.16	100.00
Total	95	100.00	

Source: Field Survey 2008

Interpretations of the Lorenz Curves

The Lorenz curves (Figs. 1 and 2) are for retailing and wholesaling respectively. The divergence of the observed curves from the line of equal distribution (LED) gives a visual measure of concentration of both types of sellers in yam marketing in the area.

The curve for retailing indicates that 52 per-

Table 4(b): Gini coefficient for retailers by monthly sales in Taraba State

Total value of monthly sales (₦)	% of total sales	Cum. % of total sales (Y)	ΣXY
8,555.71	0.12	0.12	0.00001
203,981.69	2.88	3.00	0.00253
551,716.23	7.79	10.79	0.01476
831,343.94	11.74	22.53	0.03321
1,679,121.62	23.71	46.24	0.10709
1,772,048.49	25.03	71.27	0.14254
1,653,115.65	23.34	94.61	0.4939
381,449.13	5.39	100.00	0.03160
7,081,332.46	100.00		0.48113

Source: Field Survey 2008

Mean value of retailers monthly sales = ₦74,540.34

G.C = $1 - \Sigma XY$

= $1 - 0.48113$

G.C = 0.52

Table 5(a): Gini coefficient for wholesalers by monthly sales in Taraba State

Monthly sales range ₦	No. of whole-salers	% of whole-salers (X)	Cum % of whole-salers
1-582000	4	3.64	3.64
582001-1164000	32	29.09	32.73
1164001-1746000	36	32.73	65.46
1746001-2328000	15	13.63	79.09
2328001-2910000	9	8.18	87.27
2910001-3492000	5	4.45	91.82
3492001-4074000	6	5.45	97.27
>4074000	3	2.73	100.00
Total	110	100	

Source: Field Survey 2008

Table 5(b): Gini coefficient for wholesalers by monthly sales in Taraba State

Total value of Monthly sales(₦)	% of total sales	Cum. % of total sales (Y)	ΣXY
1,163,330.76	0.62	0.62	0.00023
27,915,286.08	14.91	15.53	0.04518
52,339,416.84	27.95	43.48	0.14518
30,530,890.35	16.30	59.78	0.08148
23,552,214.21	12.58	72.36	0.05919
15,992,163.45	8.54	80.90	0.03681
22,679,716.14	12.11	93.01	0.05060
13,084,418.07	6.99	100.00	0.02730
187,257,435.90	100.00		0.44319

Source: Field Survey 2008

Mean value of monthly wholesaling = ₦ 170,340.00

G.C = $1 - \Sigma XY$

= $1 - 0.44319$

G.C = 0.56

cent of the retailers account for 36.93 percent of the total monthly sales so that the remaining (48

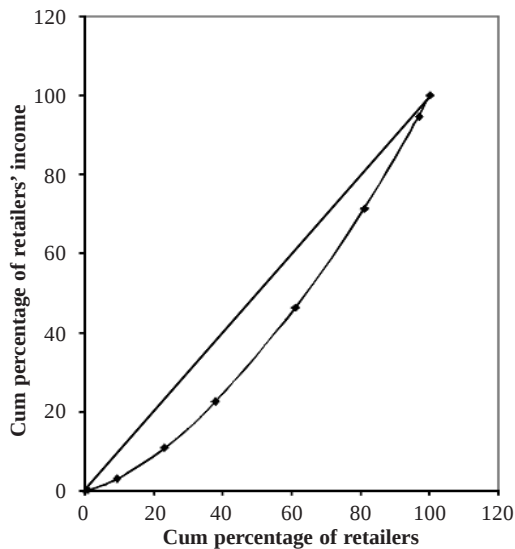


Fig. 1. Lorenz curve for yam retailing in southern Taraba state markets

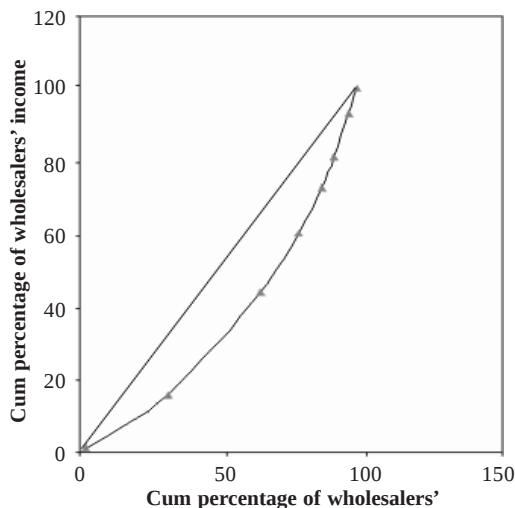


Fig. 2. Lorenz curve for yam wholesaling in southern Taraba state markets

percent of the retailers) are responsible for 63.07 percent of the total monthly sales. In the case of wholesalers, it reveals that 56 percent of the wholesalers account for 37.2 percent of the total monthly sales so that the remaining (44 percent of the wholesalers) are responsible for 62.8 percent of the total monthly sales in the area. This Gini index therefore, implies that there were income inequality in both retailing and wholesaling thus, high concentration of sellers and mar-

ket power in the yam markets. This exhibits features of imperfect market of monopolistic nature.

CONCLUSION

The study revealed that the respondents have access to market information and the yam tubers were differentiated in so many ways in the markets. Analysis unfolded that the sellers' concentration was high with high income inequality and market power exhibiting features of imperfect market of monopolistic nature.

RECOMMENDATIONS

- The exhibit of admixture of yam tubers with different sizes and varieties in the same heap for sale calls for adequate grading and standardization. This will enhance pricing efficiency and market performance of the product.
- Establishment of mechanized yam processing factories in the area. Investigations revealed that no single mechanized yam processing factory was found in the region. Philanthropists, investors and marketing unions should site modern processing factories in the area to facilitate good form and possession utilities of the product.
- More ventilated warehouses can be built in the markets by the governments and the marketing unions to encourage arbitraging and to avoid spoilage through which income of the marketers can be raised thus reduce income inequality in the markets.
- There should be more construction and repairs of feeder roads in the area. Government in conjunction with the various communities should open up more feeder roads and dilapidated ones be reconstructed to ease produce assemblage and transportation to the markets.

REFERENCES

- Ada-Okungbowa CI 1998. The market structure, conduct and performance for yam in Ondo State, Nigeria. *Agrosearch*, 4(1 and 2): 12-20.
- Adegeye AJ, Dittoh JS 1985. *Essentials of Agricultural Economics*. Ibadan: Impact Publishers.
- Adekanye TO 1977. Market structure for foodstuff: Problems and prospect for rural development in Nigeria. In: TO Adekanye (Ed.): *Readings in Agricultural Marketing*. Ibadan: Longman Nigeria, pp. 101-107.

- Agboola SA 1979. *An Agricultural Atlas of Nigeria*. New York: Oxford University Press Ltd.
- Anuebunwa FO 2002. A structural analysis of yam trade flows into Abia State of Nigeria. *Nigerian Agricultural Journal*, 33: 17-22.
- Asiedu JJ 1999. *Processing Tropical Crops, a Technical Approach*. London: Macmillan Publishers Ltd.
- Bila Y, Bulama Y 2005. Structure of Maiduguri Cattle Market, Borno State Nigeria. *Global Journal of Agricultural Science*, 4(2): 159 – 164.
- Crawford IM 1997. Agricultural and food marketing. *Marketing and Agribusiness Text*. Rome: FAO, United Nations, pp. 1-33.
- Damagaard C, Weiner J 2000. Describing inequality in plant size or fecundity. *Ecology*, 81: 1131-1142.
- FOS 1996. *Federal Office of Statistics*, Abuja, Nigeria.
- Francis HB 2001. *O'Level Agricultural Science for West Africa*. London: Macmillan Books Publishers.
- Komolafe MF, Adegbola AH, Are IA, Ashaye TI 2001. *Agricultural Science for West African Schools and Colleges*. 4th Edition. Ibadan: University Press.
- McCorriston S, Sexton R, Sheldon I 2004. Vertical Market Structure, Commodity Exports and Trade Reform. 7th Annual Conference on Global Economic Analysis. Washington DC: World Bank.
- National Bureau for Statistics 2007. *Agricultural Survey Report November, 2007*. Abuja: Federal Government of Nigeria.
- NPC 2006. *National Population Commission*. Abuja, Nigeria.
- Okereke O, Anthonio QBO 1988. The structural characteristics of the market for grains in Eastern Nigeria. In: TO Adekanye (Ed.): *Readings in Agricultural Marketing*. Nigeria: Longman, pp. 116-124.
- Olukosi JO, Isitor SU 1990. *Introduction to Agricultural Marketing and Prices: Principles and Applications*. Abuja, FCT Living Books Series Gu. Publications.
- Reardon T, Timmer P 2005. Transformation of markets for agricultural output in developing Countries since 1950: How has thinking changed? In: RE Evenson, P Pingali, TP Schultz (Eds.): *Handbook of Agricultural Economics: Agricultural Development: Farmers, Farm Production and Farm Markets*. Washington DC. 3: 1-20.