ANALYSIS OF YAM MARKETING AMONG MARKET PARTICIPANTS IN SELECTED LOCAL GOVERNMENT AREAS OF NIGER STATE, NIGERIA

Umar, M., Yusuf, A. A. and Abdullahi, M.M.

Department of Agricultural Economics, Ahmadu Bello University Zaria, Nigeria
National Agricultural Extension and Research Liaison Services, Ahmadu Bello University Zaria, Nigeria
Correspondence Email: umarapataku@yahoo.com

ABSTRACT
The study analysed marketing structure of yam in Niger state. Six yam markets were sampled for the survey namely Beji, Garatu, Paiko, Tunga Malam, Kuta and Gwada. They were purposively selected within Agricultural zone II. Two hundred and three (203) market participants were drawn using simple random sampling from the stated markets. Data were collected using questionnaires and analyzed using Gini coefficient index, marketing efficiency and marketing margin. Results of the gini coefficient index of the marketing participants were found to be (0.47) for yam producers, (0.66) for rural buyers, (0.60) wholesalers and (0.57) for retailers which is an indication of imperfect market for the participants. The marketing efficiency calculated are 982%, 932%, 783% and 748% for producers, rural buyers, wholesalers and retailers with ME ratio of > 100 for all market participants implying that there is high degree of market efficiency in yam marketing in the study area. The result of marketing margins (MM) of farmers, rural buyers, wholesalers and retailers were 12.9%, 12.6%, 10.6% and 9.1% and the Gross marketing margins (GMM) were 45.2% implies that the market performance of yam has a higher degree of imperfect competition in the market amongst the producers and rural buyers than among wholesalers and retailers. These positive financial returns however, are an indication that the marketing of yam has potentials for increasing the rural income. The study recommends provision of weight and measures, yam processing facilities, storage facilities, credit facilities and formation and strengthening of existing cooperatives.
Keywords: Marketing, Yam, Market participants, Niger State

INTRODUCTION
Marketing is a basic necessity for economic growth. As individuals within a society become more specialized in their economic activities, they come to rely upon others to supply at least some of the Agricultural products which they need. Thus a process of exchange between buyers and sellers established. With advance in economy, the number and types of exchange expand and a concomitant need for increasingly specialized marketing services such as physical distribution, storage, grading and market information gathering. The number of participants also increases with many of the specialized services being provided by intermediaries between the seller and ultimate buyer. Few buyers and sellers are in direct contact with one another and communication between them is channeled through a complex marketing system.

Marketing of yam is a very important aspect of agricultural development. In developing countries more emphasis is usually placed on increase yam production with little or no policies to increase how to distribute the yam produced efficiently and in a manner that will enhance increased productivity (Robert, 2012). Yam marketing by farmers and traders, mostly

in the immediate post-harvest period, usually involves a lot of costs and these costs are so high that lowering the costs through efficient marketing system may be as important as increasing agricultural production.

The people of developing economies face the problem of food insecurity. In order to solve the problem of food insecurity, there is the need to ensure the supply of basic food stuffs especially yam at prices within the reach of the average consumer. Marketing of agricultural produce in most Africa countries has not yet achieved necessary degree of competitiveness and transparency to ensure fair market prices for small-scale farmers, processors and consumers (Peterson, 2004). In general, the task and responsibility of marketing yam is to find a buyer and transferring ownership (through assembling and storing yam to guard against spoilage and theft, sorting and packing) to consumers. The fulfillment of these responsibilities and tasks lead to the creation of utilities which on the whole is essence of marketing.

Indigenous crops like yam are often referred to as orphan crop because even though they are vital staples for millions of people in west Africa, little is invested in improving yields and global marketing compared to major global commodity crops like maize, wheat and rice consequently, yam yield fall below potential (Fadel, 2012). Yam as a priority crop in Africa particularly Nigeria its cultivation remains a lucrative enterprise. It was found that with a potential rate of return of 78%, each dollar invested in yam research generates 52 US dollars' worth of additional food for the poor (Nteranya, 2012).

Nigeria is by far the world's largest producer of yams, accounting for over 67 percent of the world production. The commodity has the potential of becoming the leading Nigerian export after oil. In perspective, the world's second and third largest producers of yams, Ghana and Ivory Coast only produced 9.6 and 6.8 tons of yams in 2018 respectively. Marketing of these bulk of yam produced in Nigeria to generate revenue becomes imperative.

Niger State with its vision 2020 envisioned to place the state as one of the best economies in the country in the year 2020 has a vital place for agricultural development as a means of actualizing its dream. Niger State commodity and export promotion agency 2010 statistics reveal that 50 million tubers of yams are produced globally in a year out of which 5 million or 10% of the total production are produced from Niger State alone. Therefore, effective marketing system for yam will help to achieve its dream.

Marketing of tuber crops especially yam in Niger state has been disorganized congested and the sanitary conditions of the market can be described as appalling (Sharama, 1994). Also, the units of measurement are not uniform; the marketing arrangement is without weighing scales, thus, resulting in arbitrary fixing of prices and quality standards are often elusive (Hartar, 1987).

Therefore, there is a research gap on the yam market structure in the state and this research is designed to fill this gap and contribute to the existing knowledge of the yam marketing. This is imperative since adequate structured market and marketing of yam will enhance the activities of the producers and invariably improve the standard of living.

Hence, the result of the study will be useful to policy makers as a guide in designing appropriate policies needed to improve the efficiency of yam marketing.

METHODOLOGY

Study Area

Niger State is located in the North Central Zone of the country. The State has a population of 3,950.249 (NPC, 2006). The state is ranked 18th of the 36 in terms of population density. The State lies between latitudes $6^0.30'$N and $11^0.20'$N and longitude $2^0.30'$E and $10^0.3m0'$E occupying a land mass of about 76,363km^2 (NIPOST, 2020); making it the largest state in the country in terms of land mass. Niger State share common boundaries with Kaduna state to the North-East, FCT to the South – East, Zamfara State to the North, Kebbi State in the West, Kogi State to the South and Kwara state to the South West respectively. Niger State experiences dry and wet seasons with annual rainfall varying from 1,100mm in the Northern part to 1,600mm in the southern parts. The maximum temperature usually not more than 37^0C is recorded between March and June; while the minimum is usually not less than 21^0C between December and January. Generally, the fertile soil and hydrology of the State permit the cultivation of most of Nigeria's staple crops and still allows sufficient opportunities for grazing, fresh water fishing and forestry development. The GDP of Niger State as of 2017 stand at $6,002 billion (NBS, 2020). The major crops grown in the state include rice, yam, cassava, potatoes, maize, sorghum, millet and vegetables. Farm animals such as cattle, sheep, goats, horse and poultry are kept. The inhabitants of the state are mostly peasant farmers. Niger State has quite a number of markets scattered all over the state. These include rural and urban markets where agricultural commodities especially yam are assembled in large quantities. This attracts market participants not only within the state but from all over the country.

Sampling Techniques:

A multistage sampling technique was used in the selection of respondents for this study. The three agricultural zones in Niger State namely, Zone I, II, III which reflect the geographical structure of the state were examined. In the first stage, Zone II out of the three zones was purposively selected based on the preponderance of Yam production and marketing activities in the zone. This was followed by a random selection of three Local Government Areas out of the eight (8) Local government areas in Agricultural Zone II. In the third stage, two (2) Markets from each of the three (3) Local Government Areas selected were also randomly selected. The Markets selected were Beji Market and Garatu Market in Bosso LGA, Paiko Market and Tunga Malam Market in Paikoro LGA, Kuta Market and Gwada Market in Shiroro LGA respectively. Two hundred and three (203) respondents of yam marketers were selected from the six (6) markets. This number comprises of 49 yam farmers, 47 rural buyers, 39 wholesalers, and 68 retailers which form the sample size and constitute 81% of the sample frame of 251 obtained from Niger state ministry of investment, commerce and cooperatives used for the research.

Data Analytical Techniques:

Gini co-efficient, marketing efficiency and marketing margin formula were used to analyze data obtained from the respondents. The models are specified below:

$$G C = 1 - \sum (X Y) \quad \text{..... (i)}$$

Where

G C = Gini coefficient
X = proportion of sellers
Y = cumulative/percentage proportion of sales
∑ = summation sign
ME = VAM/CMS X 100……(ii)
Where
ME = Marketing Efficiency
VAM = Value Added by Marketing (retail price at customers level, less the

Purchase price) divide by cost of marketing services).
CMS = Cost of marketing services (cost of transport, handling, marketing charges and commission paid to agents
MM = SP-PP/CP X 100……..(iii)
Where
MM = Marketing Margin
SP = Selling price (retail price of yam)
PP = Purchase price
CP = Consumer price

RESULT AND DISCUSSION

Variability in yam distribution amongst market participants

Table i, ii, iii and iv shows the Gini coefficient analysis foryam producers (0.47), rural buyers (0.66), wholesalers (0.60) and retailers (0.57) respectively. This result reveals that the market is an imperfect market. This finding is in agreement with Ndanitsa, Mohammed and Ndako (2017) who reported imperfect market in their work on analysis of marketing structure and net margin of fresh mango fruits in Minna Metropolis of Niger State, Nigeria and that of Apata (2003) who in the analysis of vegetable market in Ibadan Metropolis, Oyo State, Nigeria also reported imperfect competition in the market. Though there was high income inequality and level of concentration in rural buyers (0.66) than the wholesalers (0.60), retailing (0.57) and producers (0.47), this is in line with the findings of Rueben and Mshelia (2011) on Structural Analysis of Yam Marketsin Southern part of Taraba State, Nigeria and that of Ada-Okungbowa (1998) on the Market Structure, Conduct and Performance for Yam in Ondo State, Nigeria and that of Anuebunwa (2002) on Structural Analysis of Yam trade flows into Abia State of Nigeria, who all reported high degree of inequality in sellers income and that the markets were highly concentrated.

Table 1: Gini coefficient for yam farmers by monthly sales

Qty sold/month (kg)	Frequency	% of yam farmers (X)	Cum % of yam farmers	Total value of monthly sale (N)	% of total sales	Cum % of total sales (Y)	XY	/XY/
1 – 209	2	4.08	4.08	26,000	0.52	0.52	2.1216	0.00021216
210 – 309	3	6.12	10.20	94,000	1.88	2.40	14.688	0.0014688
310– 409	4	8.16	18.36	150,000	2.99	5.39	43.9824	0.00439824
410 – 509	4	8.16	26.52	188,000	3.75	9.14	74.5824	0.00745824

510 – 609	5	10.20	36.72	280,000	5.59	14.73	150.246	0.0150246
610 – 709	8	16.33	53.05	340,000	6.79	21.52	351.4216	0.03514216
710 – 809	7	14.29	67.34	436,000	8.70	30.22	431.8438	0.04318438
810 – 909	7	14.29	81.63	548,000	10.94	41.16	588.1764	0.05881764
> - 909	9	18.36	100.0	2,948,500	58.84	100.0	1836.0	0.1836
Total	49	100.0		5,010500	100.0			0.53290622

Source: field survey, 2019

Mean value of rural buyers monthly sales = N102, 255.10

GC = 1 - ΣXY

1 – 0.53290622

GC = 0.47

Table 2: Gini coefficient for rural buyers by monthly sales

Qty sold/month (kg)	**Frequency**	**% of rural buyers (X)**	**Cum % of rural buyers**	**Total value of monthly sale (N)**	**% of total sales**	**Cum % of total sales (Y)**	**XY**	**/XY/**
1 – 209	2	4.26	4.26	16,000	0.45	0.45	1.917	0.0001917
210 – 309	4	8.51	12.77	64,000	1.81	2.26	19.2326	0.00192326
310– 409	5	10.64	23.41	120,000	3.39	5.65	60.116	0.0060116
410 – 509	4	8.51	31.92	128,000	3.62	9.27	78.8877	0.00788877
510 – 609	6	12.77	44.69	240,000	6.78	16.05	204.9585	0.02049585
610 – 709	5	10.64	55.33	240,000	6.78	22.83	242.9112	0.02429112
710 – 809	6	12.77	68.10	336,000	9.49	32.32	412.7264	0.04127264
810 – 909	7	14.89	82.99	448,000	12.65	44.97	669.6033	0.06696033
> - 909	8	17.02	100.0	1,948,600	55.04	100.0	1702.0	0.1702
Total	47	100.0		3,540,600	100.0			0.33923527

Source: field survey, 2019

Mean value of rural buyers monthly sales = N75, 331.91

GC = 1 - ΣXY

1 – 0.33923527

GC = 0.66

Table 3: Gini coefficient for wholesalers by monthly sales

Qty sold/month (kg)	Frequency	% of rural buyers (X)	Cum % of rural buyers	Total value of monthly sale (N)	% of total sales	Cum % of total sales (Y)	XY	/XY/
1 – 209	2	5.13	5.13	24,000	0.62	0.62	3.1806	0.00031806
210 – 309	3	7.69	12.82	72,000	1.85	2.47	18.9943	0.00189943
310 – 409	1	2.56	15.38	36,000	0.93	3.40	8.704	0.0008704
410 – 509	2	5.13	20.51	96,000	2.47	5.87	30.1131	0.00301131
510 – 609	4	10.26	30.77	240,000	6.20	12.07	123.8382	0.01238382
610 – 709	5	12.82	43.59	360,000	9.30	21.37	273.9634	0.02739634
710 – 809	6	15.38	58.97	504,000	12.98	34.35	528.303	0.0528303
810 – 909	9	23.08	82.05	864,000	22.26	56.61	1306.5588	0.13065588
> - 909	7	17.95	100.0	1,686,250	43.43	100.0	1795.0	0.1795
Total	39	100.0		3,882,250	100.0			0.40886554

Source: Field survey, 2019

Mean value wholesalers monthly sales N99, 544.87

GC = 1 – Σ XY

= 1 – 0.40886554

GC = 0.60

Table 4: Ginicoefficient for retailers by monthly sales

Qty sold/month (kg)	Frequency	% of rural buyers (X)	Cum % of rural buyers	Total value of monthly sale (N)	% of total sales	Cum % of total sales (Y)	XY	/XY/
1 – 209	2	2.94	2.94	30,000	0.72	0.72	2.117	0.0002117
210 – 309	23	33.82	36.76	690,000	16.67	17.39	588.130	0.058813
310 – 409	17	25.0	61.76	765,000	18.48	35.87	896.750	0.089675
410 – 509	3	4.41	66.17	180,000	4.35	40.22	177.3702	0.01773702
510 – 609	2	2.94	69.11	150,000	3.62	43.84	128.890	0.012889
610 – 709	2	2.94	72.05	180,000	4.35	48.19	141.679	0.0141679
710 – 809	13	19.12	91.17	1,365,000	32.97	81.16	1551.780	0.155178
810 – 909	2	2.94	94.15	240,000	5.80	86.96	255.6624	0.0256
> - 909	4	5.88	100.0	540,200	13.05	100.0	588.0	0.0588
Total	68	100.0		4,140,200	100.0			0.43497692

Source: Field survey, 2019

Mean value of retailer's monthly sales N60, 885.29

GC = 1 – Σ XY

= 1 – 0.43497692

GC = 0.57

Estimation of marketing efficiency

Marketing efficiency is the maximization of the ratio of output to the input used in marketing. The cost of inputs in marketing are the cost of providing marketing services while the output is the value added as the commodity passes through the marketing system. The total cost of inputs in yam marketing includes: cost of transportation, local government revenue, store rental fees cast of loading and off loading and depreciation on capital assets, which cost ₦12,400for yam producers ₦4,000 for rural buyers, ₦5,000 for wholesalers, and ₦2,800 for retailers respectively. The value added (VA) by marketing which was calculated as the difference between the selling price and purchase price per month were₦532, 500,₦522,600, ₦437,050 and ₦380,200 for yam producers, rural buyers, wholesalers and retailers respectively. The marketing efficiency were calculated to be 982%, 932%, 783% and 748% for producers, rural buyers, wholesalers and retailers respectively which were greater than 100%, implying that there is high degree of market efficiency in yam marketing in the study area. Retailers had the highest marketing efficiency ratio which depicts that these groups of market participants are more efficient in marketing of yam than the producers, wholesalers and rural buyers. The highest coefficient of marketing efficiency recorded by retailers implies that there is high degree of maximization of the ratio of output to the input used in marketing of yam among the retailers than amongst the wholesalers and rural buyers. The higher the marketing efficiency ratio, the higher will be the efficiency of the traded product (Olukosi 2004 and Regina 2011). This study agrees with separate research carried out by Ibrahim (2014) in which he discovered that marketing of shear butter among rural buyers is more efficient than amongst wholesalers and retailers

Table 5: Marketing cost, value added and marketing efficiency of yam.

Cost of marketing	Yam producers	Rural buyers	Wholesalers	Retailers
Cost of transportation (₦)	37,500	47,000	44,500	44,800
L.G revenue (₦)	1,500	1,600	1,800	1,200
Store rental fee (₦)	300	1,300	1,900	900
Loading & offloading cost (₦)	2,500	2,200	2,600	1,100
Depreciation on capital assets (₦)	12,400	4,000	5,000	2,800
(a) Total Marketing cost (MC) (₦)	54,200	56,100	55,800	50,800
(b) Purchase price (₦)	1,223,500	3,018,000	3,445,200	3,760,000
(c) Selling price (₦)	1,756,000	3,540,600	3,882,250	4,140,200
(d) Value added (VA) (₦) (c-b)	532,500	522,600	437,050	380,200
Marketing Efficiency (ME) d/a	**9.82 (982%)**	**9.32 (932%)**	**7.83 (783%)**	**7.48 (748%)**

Source: Field Survey, 2019

Estimation of marketing margin

Marketing margin of the market participants for yam in the study area was calculated as a measure of the performance of the marketing system. Thus, marketing margin was employed to analyze differences in prices of yam at different stages as it moves from the producer to ultimate consumer. It is expected that as yam moves from the farmer to the final consumer, the cost and profit level changes for each participant in the market. A high marketing margin reflects a high level of imperfect market and profitability. Marketing margin (MM) was calculated for each participants in the market (farmers, rural buyers, wholesalers and retailers).The margins of the different participants were used to find and compare the price variation along the marketing value chain. To facilitate comparison among the participants, consumer price was used as common base for all marketing margins. The estimated marketing margins for the four categories of yam market participants namely farmers, rural buyers, wholesalers and retailers are presented in the table vi. The marketing margins (MM) of farmers, rural buyers, wholesalers and retailers were 12.9%, 12.6%, 10.6% and 9.1% respectively, and the Gross marketing margins (GMM) were found to be 45.2%. This implies that although there is variation along the marketing value chain of yam for producers than amongst rural buyers, wholesalers or retailers. The variation is wider among the producers and rural buyers than wholesalers and retailers which portrayed that yam producers and rural buyers had larger share of the Gross Marketing Margin. The result implies that the market performance of yam has a higher degree of imperfect competition in the market amongst the producers and rural buyers within the study area than among wholesalers and retailers. Also, there is a high degree of business profitability and stability amongst wholesalers than amongst retailers. This confirms the work of Ndanitsa (2017) that reported imperfect competition of fresh mango fruits in Minna metropolis.

Table 6: Estimated marketing margin of the sampled market participants in the study area.

	Yam producers	Rural buyers	Wholesalers	Retailers
Purchase price	1,223,500	3,018,000	3,445,200	
Selling price	1,756,000	3,540,600	3,882,250	4,140,200
Consumer price	4,140,200	4,140,200	4,140,200	4,140,200
Marketing Margin (MM)	0.129 (12.9%)	0.130 (12.6%)	0.110 (10.6%)	0.092 (9.1%)
GrossMarket Margin (GMM)		45.2%		

Source: Field Survey, 2019

CONCLUSION AND RECOMMENDATION

This study evaluated the efficiency of yam marketers in some markets of Paikoro, Bosso and Shiroro Local Government Areas of Niger State and based on the findings, the markets are imperfect for the participants because of high Gini coefficients of (0.47) for yam producers, (0.66) for rural buyers, (0.60) wholesalers and (0.57) for retailers, gross marketing margins of 45.2% and marketing efficiency ratios 982%, 932%, 783% and 748% for producers, rural buyers, wholesalers and retailers with ME ratio of > 100 for all market participants.The study

recommends provision of weight and measures, yam processing facilities, storage facilities, credit facilities and formation and strengthening of existing cooperatives.

REFERENCES

Ada – Okungbowa, C.I. (1988). The market structure, conduct and performance for yam in Ondo State, Nigeria.*Agro search 4 (1 and 2) 12-20*

Anuebunwa F O (2002). A Structural analysis of yam trade flows into Abia state of Nigeria.*Agricultural journal, 33: Pp. 17-22*

Apata, O.M. and Apata, T.G. (2003).Marketing of citrus fruits (sweet orange) in some selected markets in Ibadan *Metropolis*. *HORTSON Proceeding, 21st Annual conference, PP 180-185.*

Fadel, N (2012). Farmer organizations support center in Africa (FOSCA), www.fosca.com accessed October, 28, 2012

National Bureau of Statistics (NBS) (2020).Federal Republic of Nigeria 2006 census. Official Gazette www.nigeriastat.gov.ng

Ndanitsa, M.A., Mohammed T. and Ndako, N. (2017). Analysis of marketing structure and net margin of fresh mango fruits in Minna metropolis of Niger state, Nigeria. *Journal of Agriculture and Agricultural Technology,* vol 8 (1). October, 2017 pp 37-43.

Nteranya, S. (2012.) International Institute of tropical Agriculture (IITA) Ibadan,www.iita.com accessed October 28, 2017

Olukosi J.O, S.U Isitor and O.O Moses (2004). Introduction of AgriculturalMarketing and Prices principles of application 4th Edition P.aPrinting Zaria, Nig. ISBN 978202223-Pp l-61

Peterson, E. B. (2004) AComparism of Marketing Margins Across Sectors. Users, and Regions. Paper presented at the 7th Annual conference on Global Economic Analysis, June 17-19 2004. Washington, D. C.

Robert, A. (2012). International institute of tropical Agriculture (IITA) Ibadan,www.iita.com accessed October 28, 2017

Reuben, J and S.I Mshelia (2011). Structural Analysis of yam markets in Southern part of Taraba State, *Nigeria Journal of Agricultural Science 2 (1): 39-44*

Regina, K (2012). Agricultural Development initiative at the Bill and Melinda Gates foundation.Nigerian(IITA) Ibadan,www.iita.com accessed October 28, 2017

Sharma, H.C. (1994) Potato marketing in Idia status issues and outlookC.I.P Social Science working paper 1994, Lima, Peru, CIP pp. 1-19.