International Scholars Journals

International Journal of Agricultural Extension and Rural Development ISSN 3254-5428 Vol. 6 (4), pp. 628-638, April, 2018. Available online at www.internationalscholarsjournals.org © International Scholars Journals

Full Length Research Paper

Empirical analysis of structure and conduct of tomato marketing in Loitoktok, Kajiado County, Kenya

[1]Joseph Kiprotich Ruttoh[*], [1]Eric K. Bett, and [1]Newton Nyairo

[1]Department of Agribusiness Management and Trade, Kenyatta University P. O Box 43844-0100, Nairobi, Kenya.

Accepted 08 May, 2018

Abstract

Tomato marketing has great potential of raising farmers and traders' income and thereby contributing to poverty alleviation. Despite economic potential associated with tomato, producers in the study area receive low price compared to consumer price. Consequently, the cause of huge price differential is unknown. The main objective of the study was to evaluate efficiency of tomato marketing in Loitoktok, and specifically to analyze the structure and conduct of tomato marketing. A total of 174 respondents were selected; 126 producers and 48 traders using multistage sampling method. Semi structured questionnaires were used to collect data, which was analyzed using the structure-conduct-performance analysis tool. In terms of market share, Herfindahl-Hirschman indices of 0.038, 0.076, and 0.2 for retailer, wholesaler and producer levels respectively were obtained, indicating that market was competitive at retail and wholesale but uncompetitive at producer level. Gini Coefficients of 0.6505, 0.5258, and 0.4524 for producers, wholesalers and retailers were obtained showing inequity in income distribution, indicating that market was imperfect. The study did not identify clear policies on price setting nor promotional strategies. From the findings, it is recommended that market actors should have access to affordable credit to invest in tomato marketing and reduce market inequalities.

Keywords: Market concentration, tomato marketing, Loitoktok, Kenya, Gini Coefficient, Herfindahl-Hirschman Index.

INTRODUCTION

Tomato crop has potential to yield high returns in a small area under intensive production. This can help small holder farmers to earn good revenues which can enable them to sustain their economic development at household level. According to (Horticultural Crops Development Authority [HCDA], 2013) Kenya was ranked fourteenth worldwide and sixth in Africa in production of tomatoes in the year 2012. The report further posited that Kajiado County was the third largest producer of tomatoes in Kenya under an area of 1688Ha, which earned them 1.2 billion Kenya shillings, thus occupying strategic position in income generation to small holder farmers. The findings by Omiti et al. (2009) revealed that 75% of total output and 70% of total marketed output from agriculture sector in Kenya is derived from smallholders thus dominating the sector.

Frimpong et al. (2015) defined marketing as the process of planning and executing conception, pricing, promotion and the distribution of ideas, goods and services to create exchanges that satisfy individual and organizational objectives. According to Osondu et al. (2015), marketing has economic value as it gives form, time and place utility to product or service. Moreover increase in marketing activity would enhance provision

Corresponding author E-mail: kiprotichjr@gmail.com

of more and better produce to large number of people which would enable marketers generate more income and increase their welfare. Marketing of agricultural products begins on the farm with planning of production to meet specific demand and market prospects (Asogwa and Okwoje 2012). Haliru and Ibitoye (2014) described agricultural marketing as an important means for development, especially for the developing countries.

The need for tomato marketing system to be well structured and efficiently organized cannot be overemphasized. It promotes trade between production and non-production areas which in turn generate revenue and enhances the pace of economic development. Due to the significance of the tomato crop to the economy and its low shelf life it requires efficient marketing. Kumar (2014) argued that efficient marketing plays an important role in increasing the share of producer in consumer price. Girei et al. (2013) posited that efficient marketing ensures sustainability of the system through enhanced revenue generation to producers and marketers, while Enibe et al. (2008) argued that efficient agricultural marketing contributes to the improvement of rural incomes in developing countries. They further posited that building an effective and efficient marketing system, is an important long term strategy for adapting sustainable agricultural development.

The industrial organization theory hypothesizes that there exists a causal flow between structure, conduct and performance. According to Pomeroy and Trinidad (1995) the theory explores that the market structure determines market conduct and thereby sets the level of market performance. Giroh et al. (2010) noted that market structure refers to organizational characteristics of the market which are believed to influence the nature of its competition and price formation. These include number of sellers, the degree of freedom of entry and exit and the degree of product differentiation. Market concentration is a key variable in analysis of market structure.

The parameters normally used to measure concentration levels are Gini Coefficient (GC) and Herfindahl-Hirschman Index (HHI). The Gini Coefficient values ranges from zero to one. A perfectly equal market is expected when concentration level tends towards zero while a perfect inequality is exhibited when concentration level tends towards one. The closeness of Gini Coefficient to unity is an indication of existence of non-competitive behaviours such as collusion and inequality in earnings (Giroh et al., 2010 and Girei et al., 2015). According to Gona et al. (2004) barriers to entry are normally measured in terms of initial capital investments to the business suggesting that those who can afford are financially buoyant to enter the business. Product differentiation is examined by heterogeneity or homogeneity of the product in its physical appearance, flavour or tastes. Haliru and Ibitoye (2014) pointed out market structure has direct influence on the revenue distribution among the marketers of the same produce in the same locality.

Market conduct refers to the behaviour and practice of firms within the industry. They are patterns of behaviours that firms follow in adapting or adjusting to the markets in which they sell or buy Nzima and Dzanja (2015). They are human behavioural patterns that are not readily identifiable, obtainable or quantifiable. They include price policies and other policies pursued by the sellers such as price determination, promotional policies and market exclusion tactics. Girei et al. (2013) argued that effects of structure and conduct can go a long way in affecting supply response in agricultural products and marketing.

Before marketing system is said to be good or efficient its structure and conduct must be critically examined. Giroh et al. (2010) argued that agricultural marketing can be assessed or measured to determine their efficiency in the areas of marketing structure and performance. According to Makorere and Mbiha (2012), marketing inefficiency could be caused by imperfect competition, presence of externalities and institutional barriers where markets do not function due to inadequate infrastructure and other support factors. The rationale for efficient marketing is to bridge the gap between the consumer price and producer price. However, this is not the case in Loitoktok as a huge price differential exists between the consumer and producer price which could depict some inefficiencies which this study tries to find out. This study fills the knowledge gap by providing insight of the structure and conduct of tomato marketing to determine the causes of market imperfection.

Conceptual framework

Study of structure and conduct can be modelled on structure conduct and performance (SCP) hypothesis. The paradigm proposes that the structure of a market influences the conduct of the firms in their decisions. It further hypothesizes that the conduct in turn influences performance of the industry. Some analysts argue that the chain of relationalships may not be unidirectional but may cause reverse causation. This can imply that performance can influence the structure of an industry (Tiku et al., 2012).

METHODOLOGY

The study was conducted in Loitoktok Sub-County, Kajiado County. Loitoktok is located at the southern tip

of the former Rift Valley province and borders the Republic of Tanzania. It covers an area of 6356.30 km^2 of which 7.66 km^2 is forested, 837 km^2 contains the parks and reserves (protected area), 4131.6 km^2 categorized as arable land, and urban settlements take up 410.2 km^2 with an estimated population of 171,520 persons (GoK, 2009). The rainfall is not equally distributed because of the presence of Mt. Kilimanjaro with lowest and highest elevation receiving 500 mm and 1250 mm respectively. Temperature varies with altitude from as low as 10˚C on the eastern slopes of Mt. Kilimanjaro to about 30˚C around Lake Amboseli (Ngaruiya, 2014).

Data Sampling and Design

This study employed survey research design. Baliyan (2016) posited that survey research provides efficiency in collecting large amounts of data with minimal cost and in a non-intrusive manner. Multistage sampling technique was used. First purposive method was used to select Loitoktok Sub-County which is major tomato production area in Kajiado County. Proportionate sampling method was then used to select respondents based on concentration of smallholder tomato farmers in each of the following wards: Rombo, Kimana, Kuku, Entonet and Lenkism. A total of 126 producers and 48 traders were selected for the study. Amongst traders, 33 were retailers and 15 wholesalers. Systematic random sampling technique was used to select producers from a list of producers obtained from Ministry of Agriculture, extension office Loitoktok Sub County using Cochran formula,

$$n = \frac{z^2 pq}{e^2}$$ (Cochran, 1977) (1)

n is the sample size, *z* = 1.96 (standard value), *p* is the proportion of households producing tomatoes in Loitoktok, *q* is (1-*p*) and *e* is the desired precision level (5%). According to Ministry of Agriculture reports there were 26,501 households in the study area, 24,115 of them producing tomatoes on small scale in the year 2017, spread across the five wards as follows: Rombo 9,632, Kimana 7,328, Kuku 5,053, Entonet 1,313, and Lenkism 789. These wards were apportioned the respondents proportionately. Through market appraisal it was established that there were around 100 retailers that sell tomatoes in the terminal market of Nairobi and 46 wholesalers visited Loitoktok on daily basis to buy tomatoes. A sample of 48 traders (15 wholesalers and 33 retailers) was selected randomly as Borg and Gall, (2003) posited that at least 30% of total population is representative. Mendoza, (1995) argued that there is no agreed sample size at different levels of value chain. Semi-structured questionnaires were administered concurrently to the three market actors to solicit the required information.

Data analysis

In evaluating market structure, this study utilized three indicators of competition. These were; concentration levels, product differentiation, market entry and exit conditions and market transparency. Gini Coefficient (GC) and Herfindahl-Hirschman (Index HHI) were used to determine extent of market concentration and nature of market competition. Concentration refers to the ratio of total transactions accounted for by a given number of participants in a given market. (HHI) is given by the formula;

$$HHI = \sum_{i=1}^{n} MS^2$$ (2)

MS is the Market Share of seller i and n is the number of sellers in the market.

$$MS_i = \frac{V_i}{\sum_i^n V_i}$$ (3)

Whereby V_i indicate the quantity of tomatoes handled by seller i and $\sum V_i$ is the total quantity of tomatoes handled by sellers in the market (in crates). HHI<0.1 indicates unconcentrated condition (competitive), 0.1<HHI<0.18 moderate concentration and HHI above 0.18 indicates high concentration (Memić, 2015, Krivka, 2016 and Hrazdil and Zhang, 2012).

Gini coefficient is obtained by the formula;

GC=$1 - \sum xy$ (4)

GC= Gini Coefficient, x is the percentage share of each class of seller, y is the cumulative percentages of the sales. The Gini coefficient ranges from zero to one. GC = 1 market is imperfect, and if GC = 0 market is perfect and competitive. Abah et al. (2015) posited that GC greater than 0.35, indicates inequitable distribution of sales income. Studies that have utilized Gini Coefficient to analyze market structure include Giroh et al. (2010), Abah et al. (2015) and Girei et al. (2015).

Bosena et al. (2011) posited that there is no agreed formula for analyzing conduct elements but conditions believed to depict exploitative relationship between producers and buyers are normally used. Qualitative data collected from traders and producers which expressed exploitative conditions was used to describe their conduct. These included price determination mechanism, availability of market information, and existence of formal marketing organizations that could affect bargaining power. Pomeroy and Trinidad (1995)

argued that in the absence of a theoretical framework for market conduct analysis; there is a tendency to treat conduct variables in a descriptive manner. “Descriptive research studies are designed to obtain information concerning the current status of phenomena which direct the researchers toward determining the nature of the situation as it exists at the time of the study” (Baliyan, 2016).Therefore, this study analyzed the conduct descriptively.

RESULTS AND DISCUSSIONS

Market structure

This was evaluated using concentration levels, conditions of entry and exit, market transparency and product differentiation.

Market Concentration

The empirical findings in Tables 1, 2 and 3 indicated HHI indices of 0.2, 0.038 and 0.076, for producer, wholesaler and retailer levels respectively. At production level, market showed oligopolistic tendencies whereby few producers controlled large share of tomatoes produced and sold. The results further revealed a very high inequality in distribution of sales income at all levels as shown by the Gini Coefficients of 0.6509, 0.5476 and 0.4742 for producers, wholesalers and retailers respectively (Tables Table 4, 5 and 6). At producer level, (Table 4), total sales of tomato amounted to KSh 32,405,100 of which 66% of producers earned less than Ksh 200,000 each accounting to 24% (Ksh7, 840,000) of the total sales income. On the other hand 3% of producers made sales of above ksh 1,000,000 each, which amounted to 23 %(Ksh 7,534,900) of total sales income. About 9% of producers earned more than Ksh 600,000 each from sales of tomato amounting to 43%(Ksh14,104,900) of sales income. This indicated extreme inequality at higher and lower levels. Overally, 33% of producers controlled 76% of total sales revenue revealing a kind of monopolistic market. The Gini coefficient of 0.6509 obtained implied that there was a very high variation of revenue generated from sale of tomato amongst the producers. This signified that action of some producers could have had some influence on other marketers as they had high market power, thus reflecting uncompetitive market conditions.

Table 5 shows the total monthly sales by wholesalers was Ksh 18,667,000 with average monthly sales of Ksh 1,244,466. About 33% of wholesalers earned average monthly sales of Ksh 1500001−2000000 amounting to 46.7% of sales income respectively, while another 33% made monthly sales of Ksh 500000-1000000 representing 20.9% of sales income and 0.07% made monthly sales of above Ksh 2,000,000 reflecting 11.7% of total sales income. The GC of 0.5476 further supported the variations witnessed in Table 5 that signify a high variation in monthly sales income by wholesalers.

Table 6 reveals that retailers had average monthly sales of Ksh 48,848 with total monthly sales of Ksh 1,612,000. About 39% of retailers had monthly sales of Ksh (20001-40000) accounting to 28% of the total sales volume, while 12% of retailers made sales of above ksh 80,000 per month, accounting to 28% of total sales income. Further the GC of 0.4742 corroborated the above variations in sales income by indicating inequality in income. Though the three levels of marketing indicated inequality in income distribution, the level of inequality was more pronounced at producer level. The variations observed in terms of market share and inequality in income distributions in Tables 1, 4, 5 and 6 can be attributed to many factors including, inability of most producers to raise adequate capital, as capital is the most essential factor in tomato marketing, thus manifesting in varied level of investment and finally earnings. This implied that there was a monopoly of tomato business by richer respondents. Another factor that could have contributed to the observed income inequalities and market share is the risk involved in agricultural marketing. According to Giroh et al. (2010), market actors who have higher propensity to take risk in investment would probably make more earnings and profits. Conversely, risk averse persons prefer less risky investment and therefore less earnings and profits. Studies by Eronmwon et al. (2014), Abah et al. (2015), Haruna et al. (2012), Fadipe et al. (2015), Girei et al. (2015) and Nzima and Dzanja (2015) corroborated this study finding for they found out high income inequalities in wholesale and retail levels of marketing and attributed their findings to different levels of investment and possibly barriers to entry. However, Enibe et al. (2008) refuted these findings as they found out that wholesale, retail and farmer level of banana marketing was very competitive depicted by low level of income inequalities. Some other studies which deviated from this finding include Mauyo et al. (2014) and Kibiego et al. (2003) who found moderate market concentrations levels depicting fairly perfect markets.

Market Entry Conditions

The initial capital required for tomato business and its sources could have been some of the hindrances as indicated by the average figures of Ksh 54,698.41, Ksh72, 666.67, and Ksh 5,803.03 for producer, wholesaler and retailer respectively. Only 33.3% of wholesalers, 12.1% of retailers and 10% of producers

Table 1. Tomato Producers' Concentration Ratio-Herfindahl-Hirschman Index.

Range of volume by producers in crates	Volume of tomatoes produced (crates) (V_i)	Proportion (market share) $MS_i = \frac{V_i}{\sum_i^n V_i}$	Market share squared (MS^2)
100 and below	3771	0.255869	0.065469
101-200	3925	0.266318	0.070925
201-300	2335	0.158434	0.025101
301-400	800	0.054281	0.002946
401-500	1927	0.13075	0.017096
Above 500	1980	0.134347	0.018049
Total	14738	1	0.200

Source: Field survey 2017 (N=126).

Herfindahl-Hirschman Index (HHI) of 0.2 (Table 1) indicates that at producer level market was concentrated reflecting uncompetitive condition.

Table 1. Tomato Wholesalers' Concentration Ratio-Herfindahl-Hirschman Index.

List of Wholesalers	Volume of tomatoes handled monthly (crates) (V_i)	Proportion (market share) $MS_i = \frac{V_i}{\sum_i^n V_i}$	Market share squared (MS^2)
W001	560	0.09396	0.008828
W002	260	0.043624	0.001903
W003	240	0.040268	0.001622
W004	600	0.100671	0.010135
W005	600	0.100671	0.010135
W006	540	0.090604	0.008209
W007	360	0.060403	0.003648
W008	600	0.100671	0.010135
W009	480	0.080537	0.006486
W010	240	0.040268	0.001622
W011	220	0.036913	0.001363
W012	400	0.067114	0.004504
W013	340	0.057047	0.003254
W014	160	0.026846	0.000721
W015	360	0.060403	0.003648
Total	5960		0.076213

Source: Field survey 2017 (N=15). (HHI) of 0.0762 indicates unconcentrated condition at wholesale level.

had acquired credit as initial capital. Regarding those who had taken out loans, the main sources were commercial banks 37.5%, microfinance institutions 16.7%, self-help groups 20.8%, and co-operative society 12.5%. Those who had not acquired credit cited major hindrances as; lack of collateral 51.4%, high interest rates 23%, and lengthy procedures 13%. These survey results corroborated. Mauyo et al. (2003) and Bosena et al. (2011) who found out lack of capital and access to credit were major barriers to agricultural marketing. Lack of access to affordable credit could have hampered entry and expansion of tomato business, acquisition of inputs and productive assets and modern equipment which could have resulted in inequitable distribution of sales income (Tables 4, 5 and 6). Concerning source of initial capital, 90% of producers, 66.7% of wholesalers and 87.9% retailers respectively, identified personal saving as the main source of initial capital. These findings were in consonance with Abah et al. (2015) and Nambiro et al

Table 3. Tomato Retailers' Concentration Ratio-Herfindahl-Hirschman Index (HHI).

List of retailers	Volume of tomatoes handled monthly (crates) (V_i)	Proportion (market share) $MS_i = \frac{V_i}{\sum_i^n V_i}$	Market share squared (MS^2)
R001	20.00	0.060241	0.003629
R002	8.00	0.024096	0.000581
R003	28.00	0.084337	0.007113
R004	12.00	0.036145	0.001306
R005	16.00	0.048193	0.002323
R006	12.00	0.036145	0.001306
R007	12.00	0.036145	0.001306
R008	8.00	0.024096	0.000581
R009	8.00	0.024096	0.000581
R010	8.00	0.024096	0.000581
R011	8.00	0.024096	0.000581
R012	8.00	0.024096	0.000581
R013	4.00	0.012048	0.000145
R014	8.00	0.024096	0.000581
R015	8.00	0.024096	0.000581
R016	8.00	0.024096	0.000581
R017	4.00	0.012048	0.000145
R018	4.00	0.012048	0.000145
R019	8.00	0.024096	0.000581
R020	12.00	0.036145	0.001306
R031	8.00	0.024096	0.000581
R022	12.00	0.036145	0.001306
R023	12.00	0.036145	0.001306
R024	8.00	0.024096	0.000581
R025	8.00	0.024096	0.000581
R026	16.00	0.048193	0.002323
R027	20.00	0.060241	0.003629
R028	4.00	0.012048	0.000145
R029	12.00	0.036145	0.001306
R030	4.00	0.012048	0.000145
R031	8.00	0.024096	0.000581
R032	4.00	0.012048	0.000145
R033	12.00	0.036145	0.001306
	332	1	0.038467

Source: Field survey 2017(N=33) (HHI) of 0.038 indicates unconcentrated market condition.

(2001). Also Umar et al. (2011) found that most sources of capital were informal institutions. Personal savings could take longer time to accumulate and thus could affect level of investment and number of tomato marketers. Lack of capital could have restricted entry by other marketers or different levels of investment, inequality in income distribution and thus explains the kind of monopoly observed in this study.

Product Differentiation

The findings indicated that only physical inspection by

Table 2. Gini Coefficient for Tomato Sales Income by Producers in Loitoktok.

Range of income (sales)	Frequency of Sellers	Cumulative frequency	Proportion of producers (Y)	Cumulative proportion of producers	Total sales (Ksh)	Proportion of sales	Cumulative proportion of total sales (Z)	YZ
Less than 200000	83	83	0.66	0.66	7840000	0.24	0.24	0.1584
200000-400000	23	106	0.19	0.85	6362700	0.20	0.44	0.0836
400001-600000	8	114	0.06	0.91	4097500	0.13	0.57	0.0342
600001-800000	4	118	0.03	0.94	2858000	0.09	0.66	0.0198
800001-1000000	4	122	0.03	0.97	3712000	0.11	0.77	0.0231
Above 1000000	4	126	0.03	1.00	7534900	0.23	1.00	0.03
Total	126		1.00		32405100			0.3491

Source: Field survey 2017. [N=126].
Gini Co efficient is given by, GC=$1 - \sum xy$= 1-0.3491= 0.6509.
Average monthly sales = Ksh 257,159

sorting and grading based on colour, cleanliness size and free of infection were used to grade tomatoes. This study results were similar to findings by Mauyo et al. (2003) and Teka (2009). Further, the study did not find any dictates from the market on the most preferred variety of tomato meaning there was no undue advantage by market actors selling different varieties of tomato the unlike Asogwa and Okwoche (2012) who found out that white sorghum was dominant over red sorghum in Nigeria.

Market Transparency

Access to reliable market information is critical for making good marketing decisions. The study did not find any formal way of disseminating market information. At producer level, brokers were leading in dissemination of market information at 35%, followed by buyers at 34.2%. The findings were in line with Asogwa and Okwoche (2012) whose finding indicated that 89% of respondents obtained market information from middlemen. This suggested brokers had great influence in price setting in the study area. At wholesale level, the leading source of market information were fellow traders by mouth 26.7, fellow traders by phone 20%, buyers by phone 20%, buyers by mouth13.3%, radio 13.3%. At retail level 69.4% received market information through fellow retailers, 30.3% through radio and 21.2% through television sets. Confirming these findings Abbah et al. (2015), Haruna et al. (2012), Tiku et al. (2012) and Mauyo et al. (2003) discovered that most market information was received through market intermediaries. Absence of reliable market information could have led to market malpractices as collusion by traders in pricing and could have could have locked out potential entrants thus allowing few traders to dominate the market, resulting in inequality in income distribution. Inadequate market information

Table 3. Gini Coefficient for Tomato Sales Income by Wholesalers in Loitoktok.

Range of income (sales)	Frequency of Sellers	Cumulative frequency	Proportion of sellers (Y)	Cumulative proportion of sellers	Total sales (Ksh)	Proportion of sales	Cumulative proportion of total sales (Z)	YZ
500000<	1	1	0.07	0.07	440000	0.024	0.024	0.0017
500000-1000000	5	6	0.33	0.40	3907000	0.209	0.233	0.0769
1000001-1500000	3	9	0.20	0.60	3504000	0.188	0.421	0.0842
1500001-2000000	5	14	0.33	0.93	8716000	0.467	0.888	0.293
Above 20000000	1	15	0.07	1	2100000	0.112	1	0.07
Total	15		1		18667000			0.5258

Source: Field survey 2017 [N=15]. Gini Co-efficient is given by, GC=$1 - \sum xy$= 1-0.5258 = 0.4742

Average monthly sales was Ksh 1,244,466.

The Gini Coefficient of 0.4742 reveals high inequality in distribution of monthly sales income.

Table 6. Gini Coefficient for Tomato Sales Income by Retailers in Nairobi Terminal Market.

Range of income (sales)	Frequency of sellers	Cumulative frequency	Proportion of sellers (Y)	Cumulative proportion of sellers	Total sales (Ksh)	Proportion of sales	Cumulative proportion of total sale (Z)	YZ
20000 ≤	5	5	0.15	0.15	90000	0.06	0.06	0.009
20001-40000	13	18	0.39	0.54	440000	0.28	0.34	0.1326
40001-60000	7	25	0.21	0.75	337600	0.21	0.55	0.1155
60001-80000	4	29	0.12	0.87	288800	0.18	0.73	0.0876
80001-100000	2	31	0.06	0.93	186600	0.12	0.84	0.0504
100001-120000	1	32	0.03	0.96	120000	0.07	0.91	0.0273
> 120000	1	33	0.03	1	145000	0.09	1	0.03
Total	1				1612000			0.4524

Source: Field survey 2017 [n=33]. Gini Coefficient is given by, GC=$1 - \sum xy$ = 1-0.4524=0.5476.

Average monthly sale was ksh 48,848 and the GC of 0.5476 indicates high inequality in monthly sales income.

could have led to marketers making poor decisions in where to sell the tomato and also pricing. However, Asogwa and Okwoche (2012) discovered that there was free flow of price information refuting this study finding.

Conduct at Tomato Market

Price Setting Strategy

About 35.7% and 29.4% of producers agreed that price was set by broker and buyer respectively. This meant price setting lied towards the point of the buyer as the broker acted on behalf of the buyer. Agreeing with these findings, Abah et al. (2015) revealed that price fixing was based on price given by middlemen. 48.5% of retailers agreed that they set the price and 30.3% believed that price setting was by negotiation. At wholesale level majority of them agreed that price was set through negotiation at 73.3%. The study findings were also in tandem with Eronmwon et

al. (2015), Asogwa and Okwoche (2012) and Raha et al. (2013) whose findings showed price setting was through haggling. Further, Eromwon et al. (2014) found out that demand and supply forces was one of the price determinant factors which was not the case in this study. The case where demand and supply forces had no effect in setting the price, coupled with limited market information could have led to price discrimination and collusion by marketers which could have explained the inequalities in income distribution. The study results also revealed that there was no clear standard way of setting the price. This was in agreement with Mauyo et al. (2003) and this could have affected inequality in income as different market actors could have charged different price of tomato of similar quality. The results also indicated that the mode of selling was basically individual at 95.2%, 94.4% and 93.9% respectively for producers, wholesalers and retailers. This indicated an open market but could also pose as a challenge to market actors due absence of market power to dictate the selling price. The findings corroborated Bosena et al. (2011), Nzima and Dzanja (2015) who found out weak organizations at producer level, but contradicted Umar et al. (2011) whose findings indicated a monopoly of gum arabic marketing by cooperative union. Absence of strong marketing organizations, lack reliable market information and market forces not dictating the prices could have led to market malpractices which could have knocked out other market actors resulting in observed income inequality.

Purchasing and Selling Strategies

There was no promotional strategy identified at any level of marketing which supported findings by Teka (2009) and Raha et al. (2013) but deviated from Nambiro et al. (2001), Eronmwon et al. (2015) who found out some form of promotion and persuasion of buyers. About 77.8%, 93.3% and 87.9% of producers, wholesalers and retailers were not members of marketing organizations respectively. For those who were members, majority of them 86.2%, 93.3% and 87.9% of producer, wholesaler and retailer organizations respectively were not involved in tomato marketing. The findings corroborated Bosena et al. (2011) who found out weak organizations at producer level. However, Asogwa and Owoche (2012) contradicted these findings for they found out that 97% of sorghum producers were members of marketing organizations but mainly formed to access extension services, market and credit facilities. This meant that absence of reliable marketing organizations could affect the bargaining power in price setting, access to credit and market. Haruna et al. (2012) found out evidence of price discrimination as consumers at different places were sold tomatoes at different prices which was also confirmed in these findings as all wholesalers and producers did not display tomato prices.

CONCLUSION AND POLICY IMPLICATION

The study analyzed efficiency of tomato marketing system regarding the structure and conduct of marketers. In terms of market share, the retail and wholesale level, the tomato market was competitive, while at producer level tomato it was not competitive as few producers controlled large volumes of marketed output. Income was unequally distributed amongst producers, wholesalers and retailers suggesting imperfect markets. A few of these marketers controlled larger share of tomato sales income. Initial capital requirement hampered entry into tomato business, and the main source of capital was personal savings. Price discrimination was noted at farm and wholesale level. There was no formal flow of market information and majority of actors were not members of marketing organizations. The combined effects of these factors could affect have affected efficiency of tomato marketing. The policy implication of these findings is that market actors should be encouraged to invest more in tomato business to reduce dominance by few actors. The government should establish a formal flow of market information so that all market actors can make informed decisions. Lending institutions should set loans suitable for agricultural marketing to expand activities of market actors and lessen bureaucracies in loan acquisition. Market actors should form cooperatives to assist them to obtain strong bargaining power which would eventually increase returns from tomato marketing. Contractual farming should also be encouraged.

REFERENCES

Abah DA, Anjeinu AG, Iorhon AP (2015). Analysis of the Structure and Conduct of Paddy Rice Marketing in Benue State, Nigeria. Am. J. of Mark. Res. 1(2):70-78

Asogwa BC, Okwoche VA (2012). Marketing of Agricultural Produce among Rural Farm Households in Nigeria: The Case of Sorghum Marketing in Benue State. Int. J. Bus. & Soc. Sc. 3(13):269-277

Baliyan SP, Marumo DS (2016). Analysis of farm management skills in small scale broiler poultry producers in Botswana. 4 (2):215-223

Borg WR, Gall MD (2003). *Educational Research: An Introduction* (Fifth. Ed). New York. Longman

Bosena DT, Bekabil F, Berhanu G, Dirk H (2011). Structure-Conduct-Performance of Cotton Market: The

Case of Metema District, Ethiopia. J. Agric., Biotec. & Ecol. 4(1):1-12

Enibe DO, Chidebelu SAND, Onwubuya EA, Agbo C, Mbah AA. (2008). Policy Issues in the Structure, Conduct and Performance of Banana Market in Anambra State, Nigeria. J.Agri. Ext. 12(2):32-40

Eronmwon I, Alufohai GO, Ada-Okungbowa CI (2014). Structure, Conduct and Performance of Plantain Marketing in Edo State, Nigeria. J. Appl. Sci. Environ. Manage. 18(3):437-440

Fadipe AEA, Adenuga AH, Raji UA (2015). Analysis of Cocoyam Marketing in Sagamu Local Government Area, Ogun State, Nigeria. Trakia J. Scie. 3: 208-213

Frimpong E, Boamah EA, Dittoh JS, Gandhi SK, Kusi AE Owusu, V. (2015). Assessing the Efficiency of Soya Bean Marketing in the Ejura-Sekyedumasi and Nkoranza South Districts of Ghana. Brit. J. Market. Stud. 4 (4): 61-73

Girei AA, Salihu M, Salamatu U (2015). Determination of Conduct, Performance and Structure of Cowpea Marketing in Yola North and South Local Government Areas of Adamawa State, Nigeria. American Res. Journal Agric. 1(2): 23-31.

Girei AA, Dire B, Salihu M, Iliya MM (2013). Assessment of Problems Affecting the Structure, Conduct and Performance of Cowpea Marketing in Yola North and Yola South Local Government Areas in Adamawa State, Nigeria*. Brit. J. Market. Stud*. 1:41-50

Giroh DY, Umar HY, Yakub W (2010). Structure, Conduct and Performance of Farm Gate Marketing of Natural Rubber in Edo and Delta States, Nigeria. Afr. J. Agric. Res. 5(14):1780-1783

Gona A, Tanko L, Mohammed I (2004). Analysis of Market Performance of the Food Service Industry in Sokoto State, Nigeria. *Proceedings of the 23rd Annual National Conference of Farm Management Society of Nigeria,* 14th – 17th December, 2009, pp. 79 – 84.

Government of Kenya. (2009). Loitoktok District Development Plan. Office of the Prime Minister, Ministry of Planning. National Development and Vision 2030, Nairobi

Haliru YU, Ibitoye SJ (2014). Evaluation of Market Structure and Efficiency of Gum Arabic Marketers in North-Eastern Nigeria. Asian J. Manage. Sci. Econ. 1(1):1-11

Hrazdil R, Zhang R (2012). The Importance of Industry Classification in Concentration Ratios. Economic Letters 114(2):224-227

Kibiego MB, Odhiambo MO, Kimani PM. (2003). Analysis of Bean Marketing System in Urban areas of Kenya. African Crop Science Conference Proceedings. 6:587-590.

Krivka A (2016). On the Concept of Market Concentration, the Minimum Herfindahl-Hirschman Index, and its Practical Application. PANOECONOMICUS. 63(5):525-540

Kumar S (2014). Marketing efficiency analysis: A case of broiler marketing in Anand district of Gujarat. Int. J. Comm. & Bus. Manage. 7(1): 186-190

Makorere R, Mbiha E (2012). Evaluation of Efficiency of Orange Marketing System in Tanzania: Empirical Evidence from Muheza District in Tanga region. *Sky J. Agric. Res.* 1(2):12 – 27.

Mauyo LW, Kosgei DK, Okalebo JR, Irkbyr AK, Kimani P, Ugen MM, Maritim HK. (2003). Structure and Conduct of Cross-border Bean (Phaseolus vulgaris) marketing in East Africa: The Case of Western Kenya and Eastern Uganda. African Crop Science Conference Proceedings. 6: 642-648

Memić D (2015). Banking Competition Efficiency: Empirical Analysis on the Bosnia and Herzegovina Banking Industry Using Panzar-Rosse Model. Bus. Syst Res. 6(2):72-92

Nambiro E, de Groote H, Kosura WO (2001). Market Structure and Conduct of the Hybrid Maize Seed Industry. A case Study of Trans the Nzoia District, in Western Kenya. Seventh Eastern and Southern Africa Regional Maize Conference 11-15th February 2001 pp474-479

Ngaruiya GW (2014). Does Reactive Adaptation Exist? Using the Ecosystem Service Governance Approach to Evaluate Post-Drought Rural Food Security in Kenya

Nzima WM, Dzanja J (2015). Efficiency of Soybean Markets in Malawi: Structure, Conduct and Performance Approach. Int. J. Bus. Soc. Sc. 6(4):162-170

Omiti JM, Otieno DJ, Nyanamba TO, Mc cullough E (2009). Factors Influencing the Intensity of Market Participation by Smallholder Farmers: A case Study of Rural and Peri-urban Areas of Kenya. Afr. J. Agric. Res. 3:57-82.

Osondu CK, Nwadike FC, Ijioma, JC, Udah, SC, Ugboaja CI. (2015). Marketing Performance of Salad Vegetables: The Case of Cabbage Marketing in Abia State, Nigeria. 4(3):151-162S.H Matsane

Oyekale AS, Matsane SH (2014). Factors Affecting Marketing of Vegetables among Small-Scale Farmers in Mahikeng Local Municipality, North West Province, South Africa. Mediterranean J. Soc. Sci. 5(20): 390-397

Pomeroy RS, Trinidad AC (1995). Industrial Organisation and Market Analysis; Fish Marketing. In G.J. Scott (Ed), Prices, Products and People: Analysing Agricultural Markets in Developing Countries. London. Lynne Reiner Publishers, London.

Raha SK, Moniruzzaman MD, Alam MD Awal MA (2013). Structure, Conduct and Performance of the Rice Market and the Impact of Technological Changes in Milling. National Food Policy Capacity Strengthening Programme

Tiku NE, Olukosi JO, Omolehin RA, Oniah MO (2012). The structure, Conduct and Performance of Palm Oil Marketing in Cross River State, Nigeria. J. Agric. Ext. & Rural Dev. 4(20):569-573

Umar, HY, Otitolaiye JO. Opaluwa HI (2011). Evaluation of *Acacia species* (gum arabic) market structure, conduct and performance in Borno State, Nigeria. *J. Agric. Soc. Sci.*7:17–20.