Sesame (*sesamun indicum L*) Market Structure in Jigawa State, Nigeria

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Abstract

Poor marketing structures among others have been identified to be one of the major issues limiting agricultural productivity in Nigeria. Sesame market structure in Jigawa state of Nigeria was examined by studying four sesame markets and also traders and selling agents. Two of the markets were rural (Suletankarkar and Kargo) while the other two were urban (Gumel and Maigatari).The markets were selected using a purposive random sampling. A non recurring survey was conducted in the selected markets in which 117 traders and 39 selling agents were interviewed from the list of their respective associations using a simple random sampling procedure. Questionnaires used as instrument of data collection were pre-tested. Times series data for sesame recorded for the period of 2000-2012 by Jigawa A.D.P. were also used. The data were analysed using Gini ratio analysis. The Gini ratio for business concentration of rural selling agents and urban selling agents were 0.6013 and 0.5360 respectively. The Gini ratio for rural traders and urban traders were 0.3664 and 0.7838 respectively. The market structure analysis revealed that urban selling agents and rural traders command greater influence. The markets function with some level of imperfection. Market structure could be improved by breaking the dominance of the sesame market by few selling agents. This could take the form of making credits available to the traders and policy intervention in the form of incentives for value addition to sesame local purchasers.

Introduction

Sesame (*Sesamum indicum*,L) is an oilseed crop grown mainly for its seeds that contain approximately 50% oil and 25% protein (Rheenen, 1973). The presence of antioxidants (sesamum, sesiamolin and sesamol) makes the oil to be one of the most stable vegetable oil in the world..

Global sesame seed production was estimated at 3.3 million tons in 2005 (FAO 2006). Twenty-five percent of world sesame hectarage is planted in Africa. Available data from FAO shows that Sesame production in Nigeria further increased from 60,000 tons in 1995 to 75,000 tons in 2005. An estimated 334,685 ha of the 3.5 m ha arable land suitable for its production is currently under sesame production in Nigeria. Sesame is an important export crop in Nigeria and the country has a substantial role in the global sesame trade. A recent Raw Materials Research and Development Council (RMRDC) survey revealed that sesame has high economic potentials in Nigeria for both industrial and export markets. Annual exports of sesame from Nigeria are valued at about US$35 million from an estimated world trade of $600 million in 2005. In value terms therefore, the crop is second to cocoa as an agricultural export. Sesame has a large potential to enhance agribusiness development and generate employment opportunities that will lead to significant impact in the rural sector particularly for households in Northern Nigeria. The knowledge of the role of the principal market participants such as middlemen for sesame is yet to be fully investigated and documented. The specific objective of the study is to:
i examine the sesame market structure in Jigawa State

Methodology

Jigawa state is located between latitudes 10^0 57' and 13^0 03' North and longitudes 8^0 08' and 10^0 27' East and it covers an area of about 22, 2110 km or about 2.2 million hectares. About 70% of the land mass is cultivable during the rainy season. It shares a common boundary with Katsina state, Niger Republic and Yobe state to the North. To the East and South, the state is bounded by Bauchi state and to the West by Kano state (Kabiru, 1998). The mean daily maximum temperatures are 19^0C and 35^0C (respectively for the coldest and hottest days) the hottest period is witnessed in April and October while the lowest temperature are recorded during the months of December and January and it can fall as low as 10^0C or lower at night.(Kabiru,1998).

The mean annual rainfall varies from 600mm to 1000 mm. Rainfall is higher in the southern part of the state. The state has an average of about 700 mm annual rainfall. Most part of the state lies within the Sudan vegetation zone. The vegetation and the climate of the state are influenced by the Equatorial Maritime and tropical continental air masses. The former is characterized by Southwesterly winds coming from the Gulf of Guinea while the later represents the dry Northeasterly winds coming from the Sahara Desert (NAERLS and NFRA, 2009).

Sampling Technique and Sample Size

For the purpose of the study, 2 non-isolated rural and 2 regional-urban markets making 4 markets were selected within Jigawa state using purposive sampling technique. The 2 non- isolated rural markets included Kargo market in Garki local government area and Suletankarkar market in Suletankarkar Local government area of Jigawa state respectively. The 2 regional -urban markets included Gumel market in Gumel local government area and Maigatari market in Maigatari Local government area. These markets were selected for the study because they constituted the main sesame growing and marketing zone in Jigawa state. To access the functioning of sesame markets in the state, it is vital for the study to cover both the rural and urban areas of its production. In this study, Kargo and Suletankarkar are the villages located closely to the sesame farming population while Gumel and Maigatari are the urban-regional markets that serve as a transit point for urban non-regional markets. Quantitative approaches were used with an emphasis on observation and questionnaires for individual and group interviews. Key informants such as the Sarkin Kasuwa (market administrator), selling agents, traders (wholesalers and retailers) were interviewed during repeat visits to the markets on market days in April and May 2012. The emphasis in each case was principally upon sesame traders and selling agents rather than on consumers. To achieve consistency and validity of information gathered, sometimes separate visits were made. 60 urban traders (30 in Maigatari and 30 in Gumel) and 57 rural traders (30 in Kargo and 27 in Suletankarkar) making a total of 117 traders were interviewed while 31 urban selling agents(15 in Maigatari and 16 in Gumel) and 8 rural selling agents (6 in Suletankarkar and 2 in Kargo) making a total of 39 selling agents were interviewed from the list of sesame selling agents and traders obtained from their respective associations, 117 traders and 39 selling agents' questionnaires were analyzed. They were selected in each market using a simple random number table.

Data Collection Procedure

The data for the study was collected through market survey by the researcher and trained enumerators. To find out the evolution of price in the selected markets monthly price information for the years 2010 to June 2012 at both wholesale and retail levels was obtained from Jigawa ADP.

At the data collection stage of the study two types of surveys were carried out.

1) Recurring survey and
2) Non-recurring survey.

Recurring survey-was conducted to reveal retail and wholesale market prices for sesame and to find out the destination of sesame collected by the wholesalers or the source of sesame supplied by the retailers.. Non-recurring survey was conducted to collect information on the actors in the market viz: traders and selling agents.

Tools of Analysis

The analytical tools employed for the study were as follows:

The Gini coefficient and the Lorenz Curve

The Gini coefficient and the Lorenz Curve were used to archive the objective of the study.. The Gini coefficient and the Lorenz Curve were used to measure the level of buyer and seller concentration in the market in order to determine the degree of concentration in the market.

The Gini Coefficient (G) is given by:

$G=I-XY$

Where:

G-Gini coefficient

X= Percentage of sellers per period of study

Y= cumulative percentage of sellers revenue per period of study.

The G has a possibility of values ranging from 0 to 1 expressing the extent to which the market is concentrated. The market concentration greatly affects the interdependence of actions among firms hence, to a large extent; determine the market behavior in the industry. The value of G equals to 0 when there is perfect equality in the size distribution of buyers or sellers. The G equals to 1 when there is perfect monopoly in the market. The Lorenz curve figuratively displays the level of concentration in the market.

Results

Table 1: Distribution of sesame rural traders by income sales

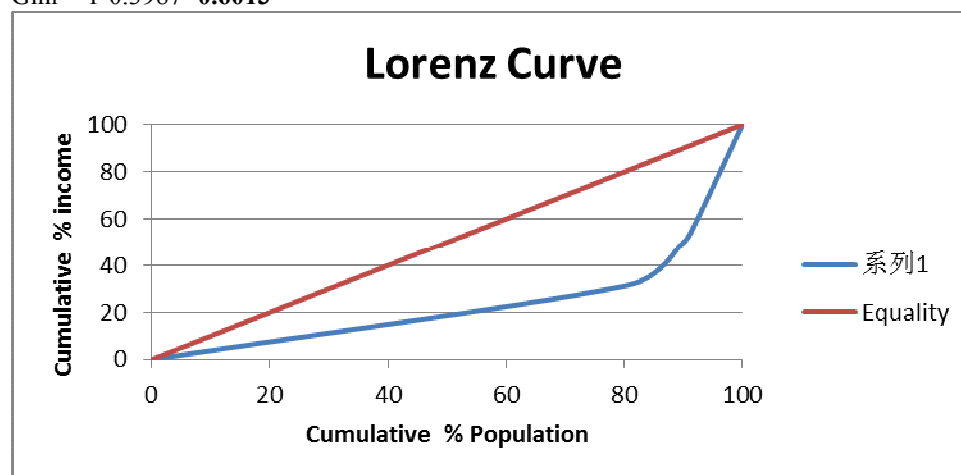| Annual income sales (millions ₦)	No. of traders frequency	Proportion of sellers	Cumulative frequency	Total value of sales (millions ₦)	Proportion of sales	Cumulative %	Trapezoidal area
1	2	3	4	5	6	6	3x7
0.39-8.1	46	0.81	46	118.2669	0.32	0.32	0.2592
8.2-18.76	5	0.09	51	64.4225	0.17	0.49	0.0441
18.77-20.37	1	0.01	52	20.37	0.05	0.54	0.0054
Over 20.37	5	0.09	57	171.973	0.46	1	0.09
Total	57	1		375.0324	1		0.3987

Gini = 1-0.3987=**0.6013**

Figure 1: Lorenz curve for business concentration of rural traders. Source: Field survey 2012

Table 2: Distribution of sesame urban traders by income sales

Annual income sales (millions ₦)	No. of traders frequency	Proportion of sellers	Cumulative frequency	Total value of sales (millions ₦)	Proportion of sales	Cumulative %	Trapezoidal area
1	2	3	4	5	6	7	3x7
0.39-8.1	38	0.633333	38	151.15	0.306338	0.306338	0.194014
8.2-18.76	14	0.233333	52	165.91	0.336252	0.642589	0.149938
18.77-20.37	5	0.083333	57	97.68	0.197969	0.840559	0.070047
Over 20.37	3	0.05	60	78.67	0.159441	1	0.05
Total	60	1		493.41	1		0.463998

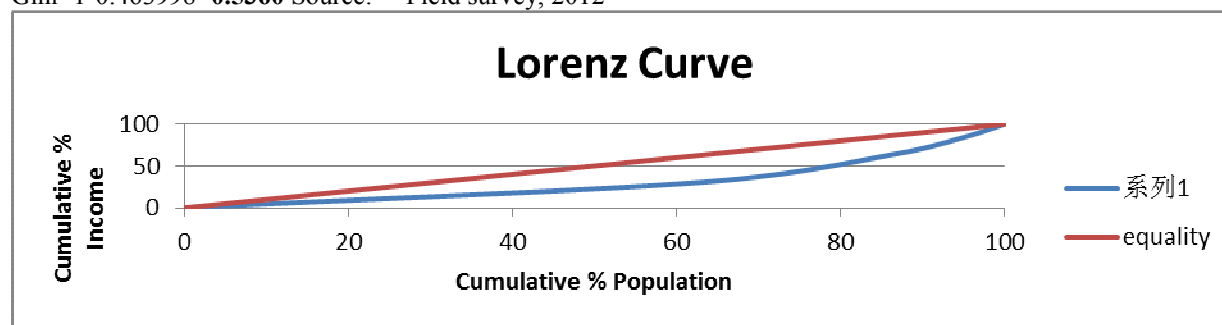Gini=1-0.463998=**0.5360** Source: Field survey, 2012

Figure 2: Lorenz curve for business concentration of rural traders. Source: Field survey 2012

Table 3 Distribution of sesame rural selling agents by income sales

Annual income sales (millions ₦)	No. of agents	Proportion of sellers	Cumulative frequency	Total value of sales (millions ₦)	Proportion of sales	Cumulative %	Trapezoidal area
1	2	3	4	5	6	7	3x7
0.075-0.01	2	0.25	2	0.085	0.013292	0.013292	0.003323
0.02-0.18	1	0.125	3	0.185	0.028929	0.04222	0.005278
Over 0.18	5	0.625	8	6.125	0.95778	1	0.625
Total	8	1		6.395	1		0.6336

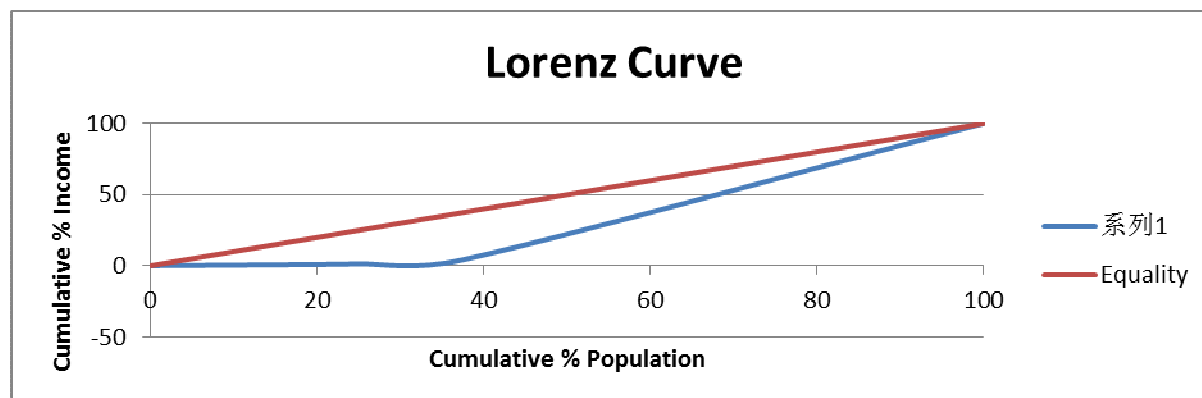Gini = *1*-0.6336 =*0.3664* Source: Field survey, 2012

Figure 3: Lorenz curve for business concentration of rural selling agents

Table 4: Distribution of sesame urban selling agents by sales income

Annual income sales(million ₦)	No. of agents frequency	Proportion of sellers	Cumulative frequency	Total value of sales (million ₦)	Proportion of sales	Cumulative %	Trapezoidal area
1	**2**	**3**	**4**	**5**	**6**	**7**	**3x7**
< 1,3	17	0.548387	17	10.037	0.111131	0.111131	0.60943
1.34-3	6	0.193548	23	14.7	0.162922	0.274053	0.053042
3.1-4	1	0.032258	24	4.5	0.049874	0.323927	0.010449
4.1-5	1	0.032258	25	4	0.044333	0.36826	0.011879
> 5	6	0.193548	31	57	0.63174	1	0.079856
➤ Total	31	1		90.227	1		0.21617

Gini=1-0.21617 = **0.78383**
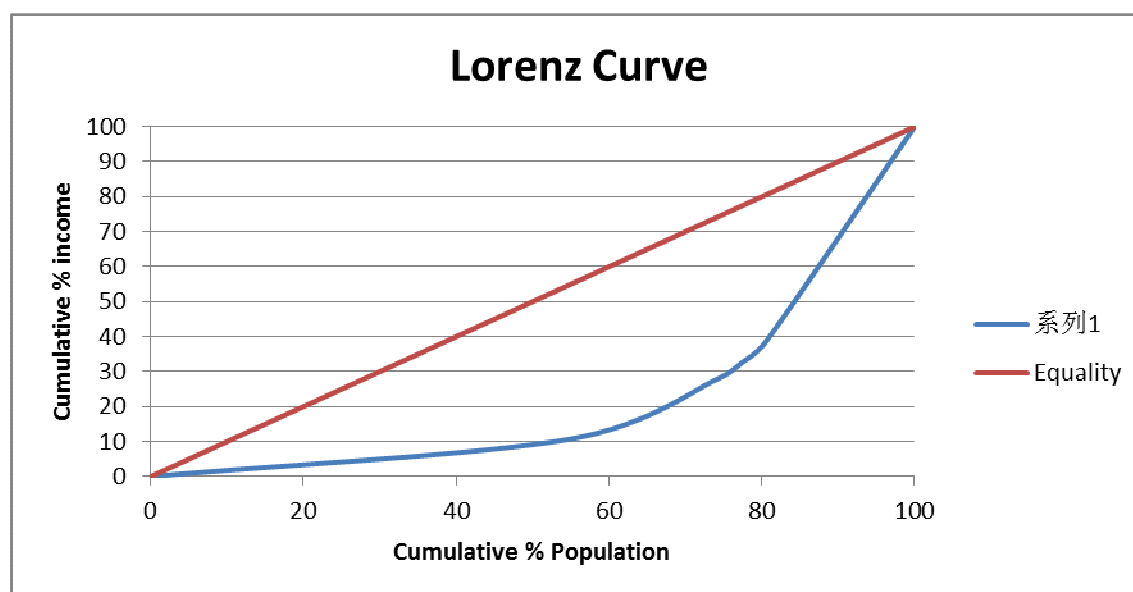
Source: Field survey, 2012

Figure 4: Lorenz curve for business concentration of urban selling agents
Source: Field survey, 2012

Discussion

Distribution of sesame rural traders by income sales

As shown in table 1, rural traders within the sales range of 0.39-8.1million ₦ per annum constituted 81% of the total respondents and this accounted for 32% proportion of the total sales of sesame, while those within the sales range of 8.2-18.76 million ₦ per annum constituted 9% of the total respondents and accounted for 17% of the total sales. Rural traders within the sales range of 18.77-20.37 million ₦ per annum constituted 1% of the total respondents and accounted for 5% of the total sales while those within the sales range of over 20.37 million ₦ per annum constituted 9% of the total respondents and accounted for 46% of the total sales.

Distribution of sesame urban traders by income sales

Urban traders (Table 2) within the sales range of 0.39-8.1 million ₦ per annum constituted 63% of the total respondents and accounted for 30% of the total sales while those within the sales range of 8.2-18.77 million ₦ per annum constituted 23% of the total respondents and accounted for 33% of the total sales. Urban traders within the sales range of 18.77-20.37 million ₦ per annum constituted 8% of the total respondents and accounted for 19% of the total sales while those within the sales range of over 20.33 million ₦ per annum constituted 5% of the total respondents and accounted for 15% of the total sales.   This reveals that majority of the rural and urban sesame traders market (81%) and (63%) had little capital for operating the business, hence could only show an impact of 32% and 30% proportion on the total sales of sesame in the state; while the 9% and 23% of respondents with sales range of over 20.37 and 8.2-18.76 dominated the sesame market in the state by 46% and 33% proportion of the total quantity.

Distribution of sesame rural selling agents by income sales

Rural selling agents (Table 3) within the sales range of 0.075-0.01 million ₦ per annum constituted 25% of the total respondents and accounted for 1.3% of the total sales while those within the sales range of over 0.02-0.18 million ₦ per annum constituted 12. 5% of the total respondents and accounted for 2.8 % of the total sales. Rural selling agents within the sales range of over 0.18 million ₦ per annum constituted 62% of the total respondents and accounted for 95% of the total sales.

Distribution of sesame urban selling agents by income sales

Urban selling agents (table 4), within the sales range of less than 1.3 million ₦ per annum constituted 54% of the total respondents and accounted for 11 % of the total sales. Those within the sales range of 1.34-3 million ₦ per annum constituted 19% of the total respondents and accounted for 16 % of the total sales. Urban selling agents within the sales range of over 3.1-4 million ₦ per annum constituted 3% of the total respondents and accounted for 4 % of the total sales while those within the sales range of 4.1-5 million ₦ per annum constituted 3% of the total respondents and accounted for 4 % of the total sales while those within the sales range of over 5 million ₦ per annum constituted 19% of the total respondents and accounted for 63 % of the total sales. This shows that in rural markets studied, majority (62%) of the agents handles majority of the sales (95%) while in urban market fewer (19%) of the agents handles majority of the sales (63%) with the majority agents (54%) handling fewer sales (11%) respectively.

Table 4 also shows the distribution of urban selling agents based on their annual income sales. The calculated Gini coefficient for urban selling agents was 0.78383. This implies a very high concentration of urban selling agents in the urban markets. The calculated Gini coefficient for rural selling agents was 0.3664 implying a lower concentration of rural selling agents in the market. The Lorenz curve also shows a very great curvature implying monopsony power for urban selling agents.

The Lorenz curve shows the actual relationship between the percentage of income recipients and the percentage of the total income they receive for the study period. Comparing the Lorenz curve for rural and urban traders, A greater curvature of Lorenz curve from the 45^0 line for rural traders along with an estimated Gini ratio of 0.6013 showed that rural traders in it had more monopsony power than urban traders with a lower curvature of Lorenz curve from the 45^0 line and a Gini ratio of 0.5360.Also comparing the Lorenz curve for rural and urban selling agents, a greater curvature of Lorenz curve from the 45^0 line for urban selling agents along with an estimated Gini ratio of 0.78 showed that urban selling agents had more monopsony power than rural selling agents with a lower curvature of Lorenz curve from the 45^0 line and a Gini ratio of 0.3664.. The bulk of demand for sesame comes from the industries using bit as a raw, material and the selling agents have access to these companies for supplies. The difference in Gini coefficient between the selling agents and traders could have stemmed from differences in their access to fund availability and differences in market behavior.

The above results agrees with the study by Umar *et al.,* (2011) who showed that majority marketers of gum arabic (63%) had enough capital for selling and few(18%) of traders dominate the gum Arabic market. Their calculated Gini (0.65) also agrees with this study that there is inequality in the distribution in income for traders. This is associated with poor structure and conduct. The distribution also showed that very few retailers accounted for the higher total monthly sales with Gini coefficient of 0.838.

Conclusion

The urban selling agents had a higher monopsony power and command greater influence with respect to sesame price in the markets.The market structures for sesame obtained in the study suggest a monopsonistic competition Market structure could be improved by breaking the dominance of the sesame market by few selling agents. This could take the form of making credits available to the traders and policy intervention in the form of incentives for value addition to sesame local purchasers.

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