Analysis of Sesame (*Sesamun indicum*, L) Marketing in Jigawa State of Nigeria

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Abstract: The study examined, the economics of sesame marketing in Jigawa State, Nigeria. The sampling procedure involved the use of purposive and simple random sampling technique. The markets for the study were purposively selected. A random sample of 156 middlemen consisting of 40 wholesalers, 77 rural assemblers and 39 buying agents from each of the markets were selected from a sampling frame of 300 sesame traders prepared with the assistance of Sarkin Kasuwa who serves as market leader for each of the markets. Face to face interview with sesame wholesalers, rural assemblers and buying agents were conducted for each of the markets, respectively. The data were analyzed using, Gini coefficient and the marketing margin analysis results showed that Gini coefficients were 0.55, 0.55 and 0.68 for rural assemblers, wholesalers and buying agents, respectively. The marketing margins were 5.7 and 4% for rural assemblers and wholesalers, respectively. Returns per ₦ invested were 0.59 and 0.56 for rural assemblers and wholesalers, respectively. The markets can be said to be highly concentrated with buying agents commanding a stronger influence on sesame prices. The markets can be said to be imperfectly competitive. The formation of cooperative association by the marketers will address market imperfections. Government involvement in the bulk purchases and provision of incentives for value addition will also improve the efficiency of sesame marketing.

Key words: Gini coefficient, Lorenz curve, market margin, wholesalers, sampling frame, Nigeria

INTRODUCTION

According to Kotler and Keller (2012), the marketing concept holds that the key to successful and profitable business rests with identifying the needs and wants of customers and providing products and services to satisfy them. Central to this revolution in business thinking is the emphasis given to the needs and wants of the customer. The job is to find not the right customers for your products but the right products for your customers. Most important concepts in marketing are segmentation, positioning, needs, wants, demand, offerings, brands, value and satisfaction, exchange, transactions, relationships and networks, marketing channels, supply chain, competition, the marketing environment and marketing programmes.

Kotler (2005) asserted that the marketing concept rests on four pillars: Target market, customer needs, integrated marketing and profitability. Kotler and Keller (2012) defined marketing as the science and art of exploring, creating and delivering value to satisfy the needs of a target market at a profit. Marketing identifies unfulfilled needs and desires. It defines, measures and quantifies the size of the identified market and its profit potential. Bearden *et al.* (2007) defined marketing as an organisational function and a set of process for creating, communicating and delivering value to customers and for managing customer relationship in ways that benefit the organisation and its stakeholders.

Sesame (*Sesamum indicum*, L) is an oilseed crop grown mainly for its seeds that contain approximately 50% oil and 25% protein (Van 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. Sesame is an important export crop in Nigeria and the country has a substantial role in the global sesame trade (Chemonics International Inc., 2002). 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. Sesame is a major export of Nigeria and attracts foreign direct investment for the purposes of export. From 2007-2009, Nigeria was the third largest exporter of sesame in the world exporting an annual average of >129,000 ton (USAID, 2010a, b). The broad objective of the study is to examine the economics of sesame marketing in Jigawa State, Nigeria. The specific objectives were to:

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- Examine the sesame market structure
- Determine the sesame marketing margin

Sesame is grown in a small proportion of land by very few farmers in the past. Sesame gained prominence in 1973, as a result of the drought and subsequent incidence of groundnut rosette virus disease that brought the downfall of groundnut production in the state. As an alternative cash crop, the crop is mainly cultivated in the North Eastern part of the state, an area characterized by low rainfall, sandy loam soils, as well as hot and dry weather that appear suitable for sesame production (Kabiru, 1998).

In Jigawa, sesame is traditionally grown as a sole crop as well as in mixtures with cereals, mainly millet and sorghum. A large number of local varieties are grown. The varieties differ in maturity, time of planting, branching habits and seed colour. The yield of these varieties are generally low about 168-314 kg ha⁻¹ when mixed with cereals. However, at the inception of the Agricultural Development Project (ADP) in 1982 sesame production was enhanced by the introduction of high yielding improved varieties like Yandev 55 and E. 8. These coupled with the use of recommended production practices, raised farmers yield to generally between 500-1000 kg ha⁻¹. Jigawa ADP is promoting sesame production through small plot adoption technique programme (Kabiru, 1998).

Most of the local and improved varieties grown in the state mature between 100-125 days and often attain a height of 0.9-1.8 m. The crop is generally planted on flat or ridges prepared by hand or work bulls and planted at the beginning of the rainy season (June to July). The land area under production is estimated at 60-100,000 ha. Agriculture is the mainstay of the state's economy engaging >90% of the working adults as a means of livelihood. Popular rain-fed crops are millet, sorghum and rice. Major cash crops include sesame, groundnut, bambaranuts, pepper and bitter lemon (Kabiru, 1998).

MATERIALS AND METHODS

Study location: Jigawa State is located between latitudes 10°57' and 13°03' North and longitudes 8°08' and 10°27' East and it covers an area of about 22, 2110 km or about 2.2 million ha. 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 and 35°C (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°C or lower at night (Kabiru, 1998).

The mean annual rainfall varies from 600-1000 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). Agriculture is the mainstay of the state's economy engaging >90% of the working adults as a means of livelihood. Popular rain-fed crops are millet, sorghum and rice. Major cash crops include sesame, groundnut, bambaranuts and pepper (Kabiru, 1998).

Method of data collection: The sampling procedure involved the use of purposive and simple random sampling technique. Maigatari, Gumel (regional-urban markets) Suletankarkar and Kalgo (non-isolated rural markets) which are the main growing areas of sesame and the main market centres of the commodity were purposively selected in Jigawa State. A random sample of 156 middlemen consisting of 40 wholesalers, 77 rural assemblers and 39 buying agents from each of the markets were selected from a sampling frame of 300 sesame traders prepared with the assistance of Sarkin Kasuwa who serves as market leader for each of the markets. The collections of data were carried out with the help of extension agents under the supervision of the researcher. The study used both primary and secondary data. The primary data source comprised of questionnaire and interview schedule while secondary information were collected from Jigawa ADP. The questionnaires for data collection were pre-tested and contained both close and open ended questions. Face to face interview with sesame wholesalers, rural assemblers and buying agents were conducted for each of the markets, respectively. The survey was conducted to collect information on the actors in the market viz, wholesalers, retailers and buying agents. Questionnaires were administered to these categories of respondents, so as to obtain a reliable data that will enable the researcher to interpret the functioning of the sesame market in the study area. The information sought from the respondents include, buying and selling behaviour, mode and cost of transportation, quantity

handled, prices bought and sold, sources of capital, marketing cost and constraints, sources of information on prices. The questions to buying agents were centered towards knowing their role in sesame marketing, information status, sources and quantity of sesame handled. Data was collected for the period May, 2011-2012.

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 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:

$$G = I - XY \qquad (1)$$

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 0-1 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 = 0 when there is perfect equality in the size distribution of buyers or sellers. The G = 1 when there is perfect monopoly in the market. The Lorenz curve figuratively displays the level of concentration in the market. The value of Gini coefficient is the same as the ratio of the area between the Lorenz curve and the 45° line to the total area above or below the line (the shaded area). Accordingly, when there is perfect equality of size distribution of buyers (or sellers) in the market, the curve coincides with the 45° line. The further away the curve is from the 45° line, the greater the level of concentration in the market. Lorenz curve is used to study concentration, distribution and inequality all over the world (Barrow, 1996). The Lorenz curve is a graphical representation of the degree of inequality in a distribution. According to Todaro (1992), Lorenz curve can be used in the analysis of the size distribution of income.

The marketing margin: This shows the fraction of the consumer's expenditure on a commodity that is received by the producer and each of the marketing agents. It is a very useful indicator of marketing efficiency. It allows comparism between the benefits received by each of the market participants in relation to their cost. The explicit model can be given as:

$$M = \left[\frac{p_1 - p_2}{p_1} \right] \times 100 \qquad (2)$$

Where:
M = Percentage of margin
p_1 = Selling price of sesame
p_2 = Supply price of sesame

RESULTS AND DISCUSSION

Distribution of sesame rural assemblers by income: Table 1 shows that rural assemblers within the sales range of 1.1-2 million ₦ per annum constituted 21% of the total respondents and this accounted for 9% proportion of the total sales of sesame while those within the sales range of over 3 million ₦ per annum constituted 25% of the total respondents and accounted for 66% of the total sales. This implies 25% of the rural assemblers impacted on 66% of the total sales in the study area. The concentration is somehow evenly distributed along the hierarchy of rural assemblers.

The Gini coefficient of rural assemblers was 0.55 implying monopsony powers. The Lorenz curve shows that a lower curvature from the 45° line implying a high concentration of the rural assemblers (Fig. 1). 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.

Distribution of sesame wholesalers by income: Table 2 shows that wholesalers within the sales range of 1-10 million ₦ per annum constituted 45% of the total respondents and accounted for 18% of the total sales while those within the sales range of 21-30 million ₦ per annum constituted 5% of the total respondents and accounted for 61% of the total sales. The implication is that majority (45%) of the wholesalers' impact on only 18% of the total sale in the study area while few (25%) impacted on 61% of the total sales in the study area. This further implies that for wholesalers' sesame trading is capital intensive. There is uneven distribution of income from sales among wholesalers. This also implies monopsony power by the few wholesalers, hence commanding greater influence in selling the commodity in the markets. Monopsony power dictates prices in markets at the detriment of other market participants.

Gini coefficient gives an indication of market concentration in the market. The market concentration normally referred to the domination of one firm over another within the marketing system. The Lorenz curve which shows the actual relationship between the percentage of income recipients and the percentage of the

Table 1: Distribution of sesame rural assemblers by income

Annual income (millions ₦)	No. of rural assembler frequency	Proportion of rular assemblers	Cumulative frequency	Total value of sales (millions ₦)	Proportion of sales	Cumulative (%)	Trapezoidal area (3×7)
0-1	24	0.31	24	12.98390	0.055015	0.055015	0.017055
1.1-2	16	0.21	40	22.21015	0.094108	0.149123	0.103158
2.1-3	18	0.23	58	43.62590	0.184850	0.333973	0.076814
Over 3	19	0.25	77	157.18710	0.666027	1	0.25
Total	77	-	-	236.00705	1	-	0.447027

Gini = 1-0.447027 = 0.553; Field survey, 2012

Table 2: Distribution of sesame wholesalers by income

Annual income (millions ₦)	No. of wholesalers frequency	Proportion of wholesalers	Cumulative frequency	Total value of sales (millions ₦)	Proportion of sales	Cumulative (%)	Trapezoidal area (3×7)
1-10	18	0.45	0.45	118.4383	0.187346	0.187346	0.084306
11-20	14	0.35	0.80	220.6945	0.349095	0.536441	0.187754
21-30	2	0.05	0.85	51.3360	0.081203	0.617645	0.030882
Over 30	6	0.15	1	241.7210	0.382355	1	0.15
Total	40	-	-	632.1898	1	-	0.452942

Gini = 1-0.452942 = 0.55; Field survey, 2012

Table 3: Distribution of sesame buying agents by income

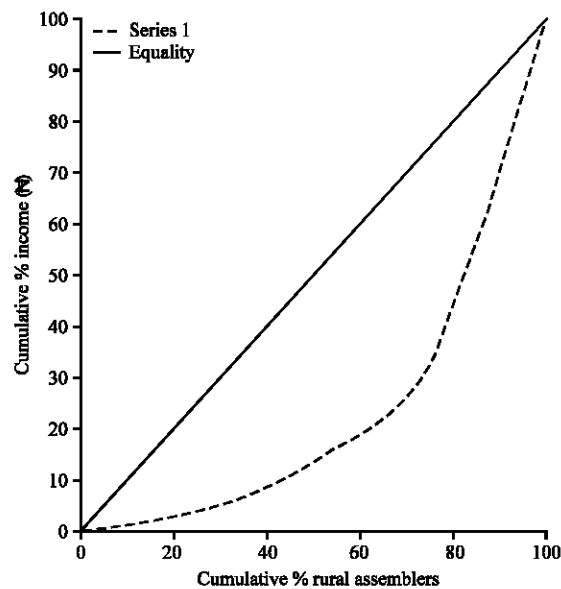| Annual income (mllions ₦)	No. of buying agents frequency	Proportion of buying agents	Cumulative frequency	Total value of sales (millions ₦)	Proportion of sales	Cumulative (%)	Trapezoidal area (3×7)
0-1	18	0.46	18	5.467	0.05	0.05	0.023
1.1-2	9	0.23	27	13.955	0.15	0.20	0.046
2.1-3	3	0.08	30	7.750	0.08	0.28	0.022
Over 3	9	0.23	39	68.900	0.72	1.00	0.230
Total	39	-	-	96.072	-	-	0.321

Gini = 1-0.321 = 0.68; Field survey, 2012

Fig. 1: Lorenz curve for business concentration of rural assemblers

Fig. 2: Lorenz curve for business concentration of wholesalers

total income they receive for the study period reveals a greater curvature from the 45° line (Fig. 2). This along with an estimated Gini ratio of 0.55 showed that sesame wholesalers in the study area have some degree of monopsony power. Similar findings by Umar *et al.* (2011), shows that wholesalers posses monopsony powers.
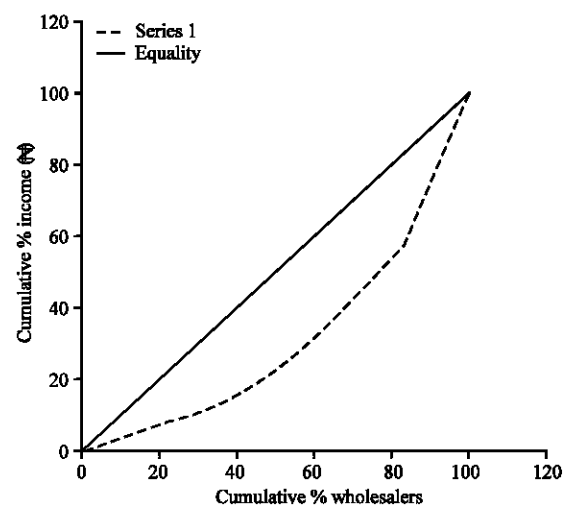
Distribution of sesame buying agents by income: Table 3 shows that buying agents within the sales range of <1 million ₦ per annum constituted 46% of the total respondents and accounted for 5% of the total sales while those within the sales range of over 3 million ₦ per annum constituted 23% of the total respondents and accounted for 72% of the total sales. The implication is that majority (46%) of the buying agents' impact on only 5% of the total sale in the study area while few (25%) impacted on

72% of the total sales in the study area. This means uneven distribution of income from sales in the market. This implies buying agents commands greater influence in sesame price in the markets. Monopsony power empowers buying agents to dictates prices in markets at the detriment of other market participants. The calculated Gini coefficient for buying agents was 0.67. This implies a very high concentration of selling agents in the markets. The Lorenz curve also shows a very great curvature away from the 45° (Fig. 3). 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 assemblers, buying agent and wholesalers, a greater curvature of Lorenz curve from the 45° line for rural assemblers along with an estimated Gini ratio of 0.68 showed that buying agents in it had more monopsony power than wholesalers and rural assemblers with a lower curvature of Lorenz curve from the 45° line and a Gini ratio of 0.55 and 0.55, respectively. The bulk of demand for sesame comes from the industries using bit as a raw, material and the buying agents have access to these companies for supplies. This implies a wholesaler requires a high capital to succeed in sesame marketing in the study area. The earliar 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. Anuebunwa (2008), reported that high Gini coefficients of 0.812 and 0.8 for wholesalers and retailers of okra implying possibility of non-competitive behaviour and inequality in earnings among marketers.
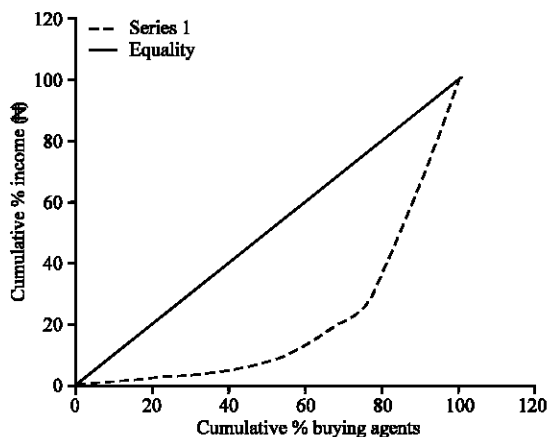

Fig. 3: Lorenz curve for business concentration of buying agents

According to Anuebunwa (2008), 44% of the wholesalers made sales valued 79,000.00 ₦ representing 5% of the total value of monthly sales while 5% made sales worth 286,125.00 ₦ representing 19% of the total value of monthly sales. About 3% of the wholesalers handled 21% of the total value of monthly sales while 96% handled 53% of the total value of monthly sales. Also Ugwumba *et al.* (2011) showed that the Gini coefficient for fresh fish market in Anambra was 0.5292. This result indicates a high level of concentration and consequently high inefficiency in the market structure for fresh fish in the study area. According to Enibe *et al.* (2008), the Gini coefficients of 0.31, 0.21 and 0.17, respectively were obtained for banana wholesalers, retailers and farmers. It implies that there is a low degree of inequalities among the middlemen and farmers. A study revealed that Gini ratio for business concentrations for soybean were 0.25 and 0.11 for wholesalers and retailers. Afolabi (2009), reported a Gini ratio for business concentration of 0.44 for gari sellers in South West Nigeria.

Analysis of margin: The analysis of cost margin is important, as it reveals whether the traders are making profit or not and serves as a guide for decision making by a trader and other prospective sesame traders. For the analysis, the items includes, the buying price for sesame, transportation cost, handling charges, cost of empty bags, total marketing cost, selling price for sesame, average marketing cost, as well as average profit realized per 72 kg bag. Results of the distribution of the share of marketing margin for sesame rural assemblers, wholesalers were presented in Table 4.

Table 4 reveals the marketing margin, the farmers' share and return per ₦ invested in the marketing of sesame by wholesalers and rural assemblers in the study area. Marketing margin for wholesalers and rural assemblers were 4 and 5.7%, respectively. Higher marketing margin was recorded for the rural assemblers than the wholesalers. Scarborough and Kydd (1992) opined that 5 and 10% marketing margins are acceptable

Table 4: Marketing margin for wholesalers and rural assemblers per 72 kg bag sesame

Items	Wholesalers	Rural assemblers
Purchase price of sesame (₦) A	10814.00	10166.00
Transportation (₦)	100.00	200.00
Handling charges (₦)	40.00	40.00
Cost of empty bag (₦)	150.00	150.00
Total marketing cost (₦) B	290.00	390.00
Selling price (₦) C	11267.00	10788.00
Total marketing margin (₦)D (D = C-A)	453.00	622.00
Traders profit (₦) D-B	163.00	232.00
Gross marketing margin as % of selling price	1.45	2.15
Return per ₦ invested	0.56	0.59
Marketing margin (%)	4.00	5.70

Field survey, 2012

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for storable and perishable goods, respectively. This implies that the margins received by the wholesalers and retailers are acceptable. The low marketing margin of sesame is in line with what is expected from undifferentiated primary products in competitive markets (Gabre-Madhin, 2001). This is in agreement with Achike and Anzaku (2010) who observed a low marketing margin of 15 and 6.1% for wholesalers and retailers and the gross marketing margin at the wholesale level exceeded that at the retail level by 5%. The marketing margins of retailers were generally higher than those of wholesalers. This was probably because rural assemblers spend more on transportation than wholesalers. Nwaru and Agommu (2011) found higher marketing margin for retailers than wholesalers.

Anuebunwa (2008) reported that out of the 38.46% share of retail price obtained by traders, 10.57% goes to assemblers, 15.98% goes to wholesalers and 11.93% goes to retailers. Abdu shows that the greatest share of the final retail price obtained by traders goes to the wholesalers. Giroh *et al.* (2010) showed that marketing margin per hectare for rubber was 44.03%. This implies that farm gate marketers reaped 44.03% of the final price offered per hectare. This is high relative to the prevailing deposit interest rate of 5-10% in the banks. In a perfectly competitive market, the marketing margin on the average and in the long run is expected to be equal to the cost of capital with competitive return to labour, management or risk. The high market margin is a reflection of imperfectly competitive market condition.

Returns per ₦ invested were 0.56 and 0.59 for wholesalers and rural assemblers, respectively. It means for every ₦ invested in sesame the wholesalers and rural assemblers realise 56 and 59 kobo, respectively. This shows that sesame marketing is profitable. Among the marketing functions carried out in the marketing process, loading and offloading and cost of empty bag constituted 150 and 40 ₦ per 72 kg bag while transportation constituted 100 and 200 ₦ per 72 kg bag sesame for wholesalers and rural assemblers, respectively. Apart from the cost of empty bags, transportation happens to be the highest cost item in the business. Findings of Okwuokenye and Onemolease (2011) and Akinpelu and Adenegan (2011), also confirmed transportation as the highest marketing function carried out in agricultural marketing.

CONCLUSION

Based on the findings of the study, sesame marketing is a profitable business. However, buying agents are more concentrated than the rural assemblers and wholesalers. Few wholesalers and buying agents with large capital position controlled a greater part of the sales in the markets studied. The buying agents and wholesalers command greater influence with respect to sesame price in the markets. There is need for the formation of cooperative societies by rural assemblers and wholesalers of sesame. This will make them benefit from economies of scale in marketing of sesame and break the concentration caused by few wholesalers and buying agents.

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