

Market Structure, Conduct, Channel and Margin of Dry Season *Okra* Vegetable in South-Eastern Nigeria

Agbugba Ikechi Kelechi^{1&2+}, Nweze Noble Jackson¹, Achike Anthonia Ifeyinwa¹ and Obi
Ajuruchukwu²

¹ Department of Agricultural Economics, University of Nigeria, Nsukka, Enugu State, Nigeria, West Africa

² Department of Agricultural Economics & Extension, University of Fort Hare, Alice, Eastern Cape, South Africa

Abstract. The study was carried out with four purposes. The first objective included the socio-economic characteristics of dry season *Okra* marketers; the second described the marketing channel; the third analysed the structure and conduct of the market; and the fourth determined the marketing margin for dry season *Okra* marketers. Multi-stage sampling technique was adopted for the study. 111 *Okra* marketers were selected and structured questionnaires administered to them. Descriptive statistics, Gini coefficient model and Marketing margin analysis were used for analyzing the objectives. Most of the *Okra* marketers interviewed were females indicating that these were doing active dry season marketing of *Okra* vegetable in the study area. Eight (8) marketing channels were identified. From the Gini coefficient model, which determined the level of concentration in relation to the structure of the markets of wholesale and retail markets, there were no barriers to entry and exit in and out of the markets during the dry season period. There was a high percentage (93%) in the marketing margin of the marketers. Government's indispensable role in building and repairing worn out roads, as well as constructing new ones; which will in turn bring about reduction in the cost of transportation and minimization of vegetable losses in the marketing process should be encouraged.

Keywords: *Okra*, dry season, market, marketing, marketers.

1. Introduction

Okra is an important fruit vegetable crop belonging to the genus *Abelmoschus*, and family *Malvaceae*. It has two main species: *Abelmoschus esculentus* (L.) Moench. and *Abelmoschus caillei* (A. Chev.) Stevels [1]. It originates probably from East Africa and widely distributed in the tropics, subtropics and warmer portions of the temperate region [2]. It features prominently in vegetable markets in the South-eastern Nigeria [3].

The economic importance of *Okra* cannot be overemphasized. It contains carbohydrate, proteins and vitamin C in large quantities and plays a vital role in the human diet as young immature fruits are important fresh fruit vegetable that can be consumed in different forms [4]. They could be boiled, fried or cooked. In Nigeria, *Okra* vegetable is usually boiled in water resulting in slimy soups and sauces, which are relished. The fruits also serve as soup thickeners [5], [6]. The dried seed of *Okra* is a nutritious material that can be used to prepare vegetable curds, roasted and ground to be used as coffee additive or substitute. *Okra* mucilage is suitable for medicinal and industrial applications. It has medically found application as a plasma replacement or blood volume expander. Industrially, *Okra* mucilage is usually used in to glaze certain papers and also useful in confectionery among other uses [7], [8].

Worldwide production of *Okra* as fruit vegetable is estimated at 6 million tonnes per year. In West Africa, it is estimated at 500,000 to 600,000 tonnes per year [9]. In Nigeria, there are two distinct seasons for

⁺ Corresponding author. Tel: +234-8036483852; fax: +234-8164564221.
E-mail address: iykeagbugba1@yahoo.co.nz.

Okra, the peak and the lean seasons. During the lean season, *Okra* fruit are produced in low quantities, scarce and expensive to get [10].

Marketing of *Okra* during the dry season is complex due to its perishable and seasonal nature as well as its bulkiness [11]. The marketing channel is an important part of its cost, and its location to the market may shorten the path of distribution from producers to consumers and makes the marketing process simple and efficient [12]. Its marketing is gradually developing as many people develop interest to engage in the enterprise as market intermediaries. Proper marketing is necessary to arrest wastage being experienced during the dry season period [13].

Okra marketing during the rainy season when all the crops mature at about the same time, creates glut in the market due to the fact that many of the farmers and sellers do not have storage facilities, thereby leading to very low returns of the crop per hectare. Moreso, there is high economic return per hectare of *Okra* because the number of dry season marketers engaged in its marketing is reduced. In order words, the marketing efficiency becomes an important determinant factor to the performance of the industry.

This study therefore (i) analysed the socio-economic characteristics of dry season *Okra* marketers in the study area; (ii) described the marketing channel for dry season *Okra* in the study area; (iii) analysed the structure and conduct of dry season *Okra* market in the study area; and (iv) determined the marketing margin for dry season *Okra* marketers in the study area.

2. Methodology

The study was conducted in South-eastern Nigeria. Out of the five states which make up South-eastern Nigeria, Abia, Imo and Enugu states were randomly selected for the study. The area is situated east of River Niger and covering an area of 29,908 sq. km with population of about 16,381,729 persons [14] and lying on latitudes 5° and 7° 75' North and longitudes 6° 85' and 8° 46' East [15]. About 70% of the total population are peasant farmers cultivating arable crops and vegetables, few dealing on cash crops like oil palm and cocoa [16]. The south-eastern states have contiguous characteristics in relation to vegetable production and marketing activities of selected indigenous vegetables (especially *Okra*) during the dry season.

Primary data which was used for this study was obtained through the use of structured questionnaires administered to the respondents. Two agricultural zones were selected from each of the 3 South-eastern states making it 6 agricultural zones in a whole. Two markets were randomly selected from a list of major markets from the 2 agricultural zones previously selected. This gave a total of 12 markets. Ten dry season *Okra* marketers were randomly selected from each of the markets, except 1 market where 9 marketers (i.e. 4 wholesalers & 5 retailers) were randomly selected for the study. In all, a total of 38 marketers each was randomly selected from Abia and Imo states, whereas 35 marketers were chosen for Enugu state. This gave a total sample size of 111 respondents for the study.

2.1. Analytical Techniques

Descriptive statistics such as frequencies and percentages were used to analyze the socio-economic characteristics, conduct, and also describe the marketing channels of the respondents. *Gini* coefficient was used to examine the structure, while margin analysis for analyzing the marketers' margins in the study area.

Gini coefficient was used to measure and examine concentration and degree of inequality of the marketers and then the structure of the market. *Gini* coefficient refers to a number or an index varying between zero and one; zero signifying perfect equality and one, perfect inequality.

Mathematically, *Gini* coefficient is represented by (1) below:

$$G = 1 - \sum_{k=0}^{k=n-1} (\partial Y_{k-1} + Y_k)(\partial X_{k-1} - X_k) \quad (1)$$

where G = *Gini* coefficient; X = Number of dry season *Okra* marketers; Y = Trade volume or total sales; X = Cumulated percentage or proportion of the marketers; ∂Y = Cumulated percentage or proportion of total sales or trade volume; n=Number of marketers; k = Number of marketers minus 1 (i.e. k = n-1).

Marketing margin analysis was employed to determine the margins of the marketers. The equation is represented below:

For Wholesalers:

$$\frac{\text{Wholesale selling price} - \text{wholesale buying price}}{\text{Wholesale buying price}} \times \frac{100}{1} \quad (2)$$

For Retailers:

$$\frac{\text{Retail selling price} - \text{Retail buying price}}{\text{Retail buying Price}} \times \frac{100}{1} \quad (3)$$

3. Results and Discussion

3.1. Socio-Economic Characteristics of Dry Season *Okra* Marketers

From the research analysis, it was discovered that females were the key players which comprised 94% of the wholesalers and 100% of the retailers. This implied that any improvement in infrastructure and marketing operations, processing as well as production, females will benefit solely since their roles are crucial and oftentimes interwoven. The wholesalers (39%) and retailers (36%) fell within the age bracket 31-50 years. This implied that the marketers were in their active productive age. A greater percentage of the marketers that are married were wholesalers (73%), and 65% for retailers. Household sizes were generally larger among the wholesalers and retailers, where 84% and 80% have between 4 and 9 people in their families respectively. However, this implies that most of the marketers were of child-bearing age between 31 and 40 years old. Majority (49%) of the respondents had formal education till secondary school level, 35% had primary education, while 11% had education till tertiary, while 5% of the respondents had no formal education.

Majority of the wholesalers and retailers who were primarily engaged in dry season marketing and accounted for 84% and 93% respectively, while 16% of the entire respondents were part-time marketers as 7% were engaged in teaching/civil service, 4% were involved in trading of other commodities, 1% were involved in farming activities as producers, while 1% were involved in artisanal works. This implied that dry season *Okra* marketing is a major lucrative occupation, and hence, draws so many women into its marketing operations.

3.2. Structure and Conduct of the Market

This section sought to describe and analyse the structure of dry season *Okra* market as well as their conduct.

Table 1: Gini Coefficient for Dry Season *Okra* Wholesalers in South-Eastern Nigeria

| Incomes | Number of | Percentages | Cumulative | Cumulative | Total Sales | % of Total | XY |
|-------------|-----------|-------------|------------|------------|-------------|------------|---------|
| < 1,000 | - | - | - | - | - | - | - |
| 1,000-9,999 | 3 | 5.4 | 3 | 5.4 | 13,000 | 0.41 | 0.00022 |
| 10,000- | 6 | 10.7 | 9 | 16.1 | 75,000 | 2.36 | 0.0025 |
| 20,000- | 10 | 17.8 | 19 | 33.9 | 220,000 | 6.91 | 0.012 |
| 30,000- | 5 | 8.9 | 24 | 42.8 | 158,000 | 5.15 | 0.0046 |
| > 39,999 | 32 | 57.2 | 56 | 100.0 | 2,710,000 | 85.17 | 0.487 |

* *Gini coefficient* = $1 - \sum XY = 1 - 0.50632 = 0.494$; XY = % of marketers multiplied by cumulative % of total sales

Source: Field Survey, 2011

The distribution of the marketers by their income or sales and the no of marketers in kg values in each category for 61 days were also presented. Sales volume on the other hand, refers to the value of *Okra* vegetable sold by the marketers at each level of the chain. Table 1 shows how *Gini* coefficient was derived.

Table 1 showed *Gini* coefficient as 0.49 implying that the concentration of market sales among *Okra* wholesalers was low. This was due to a large number of wholesalers competing with each other. This is an indication that there was no *Okra* wholesaler exercising control over the market price. This is a typical feature of a purely competitive market structure, a sign of efficiency in the market. In other words, there is also a reflection of low level of income inequality from sales among the wholesalers.

From Table 2, the *Gini* coefficient (0.79) for *Okra* retailers represented a situation where powerful *Okra* retailers dominate the market, a sign of inefficiency in the market structure. From this computation, it can be deduced that there was significant inequality in the income from sales among retailers as against that of wholesalers as 0.49. Hence, the *Gini* coefficient of *Okra* wholesalers indicated greater equality than that of the retailers and vice versa.

Table 2: *Gini* Coefficient for Dry Season *Okra* Retailers in South-Eastern Nigeria

| Incomes from | Number of | Percentages of | Cumulative | Cumulative | Total Sales (Y) | % of Total | XY |
|---------------|-----------|----------------|------------|------------|-----------------|------------|---------|
| < 1,000 | 3 | 5.5 | 3 | 5.5 | 3,000 | 0.29 | 0.00016 |
| 1,000-9,999 | 21 | 38.2 | 24 | 43.7 | 102,000 | 9.96 | 0.038 |
| 10,000-19,999 | 8 | 14.5 | 32 | 58.2 | 103,000 | 10.06 | 0.015 |
| 20,000-29,999 | 9 | 16.4 | 41 | 74.6 | 145,000 | 19.53 | 0.032 |
| 30,000-39,999 | 2 | 3.6 | 43 | 78.2 | 65,000 | 6.35 | 0.0022 |
| > 39,999 | 12 | 21.8 | 55 | 100.0 | 551,000 | 53.81 | 0.12 |

* *Gini* coefficient = $1 - \sum XY = 1 - 0.20736 = 0.79264$; XY = % of marketers multiplied by cumulative % of total sales

Source: Field Survey, 2011

3.2.1 Conduct of the marketers

Majority of *Okra* wholesalers depend on northern farms, thereby making their procurement, sometimes on a fortnight basis from the north to the area of study. Supply which is from northern states is higher during the dry season period because harvesting takes place at that time contrary to when harvest season takes place. It is pertinent to note that other fruit vegetables listed below come along from the north during the period: Tomatoes (*Lycopersicon esculentum*); Pepper (*Capsicum spp*); Garden egg (*Solanum spp*); and Onions (*Allium cepa*).

Okra marketers were known to perform certain roles such as: provision of credit to producers (sometimes by the wholesalers and commission men); packing of the products (sometimes by commission men, wholesalers and retailers depending on the stage on the marketing channel); storage for the next planting season (mainly for the wholesalers); transportation to external markets (wholesalers and retailers to a lesser extent), direct sales to consumers (mainly retailers and sometimes, wholesalers), transportation to the point of retail (producers sometimes, commission men and wholesalers, who might also be involved in retailing), and supply of market information.

Public vehicles mainly J5 buses and luxurious buses ply through the northern roads in transporting *Okra*. Very often the drivers bring the produce to the market on credit and get paid after the marketers have sold the produce. Buses as well as *Keke Napep* a.k.a tricycle operators convey *Okra* to various retail markets or points of sale in the study area. The buses and *Keke Napep* charge the marketers according to the bags, baskets or basins of *Okra* respectively from where they are offloaded to where they are retailed. Motor vehicle operators face increasing harassment and extortion by police (at the numerous road blocks), Vehicle Inspection Officers (VIO's) and Road Safety Corps (FRSC). The wholesalers claimed that these unwholesome activities result in delays and high transport costs.

High cost of petrol and petroleum products, spare-parts, and vehicle maintenance have resulted in very high transportation cost for *Okra* marketers. Bad condition of the roads has led to the vehicles suffering considerable wears and tears. The motor vehicle operators bear the losses resulting from accidents. They said the losses are borne jointly-the traders bear the loss of their goods, while the transport operators bear the cost of repairs on their vehicles or their replacement.

Majority (95%) of *Okra* wholesalers made use of public vehicles since the major aspects of their production took place in northern region of the country. Also, majority (61%) of the wholesalers agreed that there was presence of commission agents in wholesale marketing and agreed that the product price was set by the commission agents themselves. However, majority of *Okra* retailers (89%) believed that individual marketers were the price setters in the market and believed that there was absence of *Okra* market dealers association. This therefore, implied that the marketing of *Okra* is unorganized at the retail level of the market.

The rest 23 % and 15% of the wholesalers indicated that their price was set by the individual marketers and *Okra* market association respectively.

There was an indication of an informal group of marketers coming together to make *Okra* supply and marketing easy for themselves at the wholesale end. They made agreements with the driver of the vehicle and commission men to bring in the consignments from the north to the study area. The wholesalers were more organized than the retailers who were individualistic in their activities. South-eastern Nigeria can be said to be a major market due to its high demand.

3.3. *Okra* Marketing Channels

Eight marketing channels were identified for *Okra*. Some of the channels went outside the marketing region due to the producers' farming environment (in the northern region of the country). The marketing channels were rightfully identified, though some were negligible compared to others. Channel comparison for *Okra* was also done based on the multiple responses of the marketers. Percentages were used to denote these responses as the products pass through each channel from the producers to consumers.

3.4. Marketing Margins

Marketing margin for *Okra* is the difference between producer and consumer prices. It also describes the price differences between other points in the marketing chain, like the wholesale and retail prices of *Okra* vegetable.

Table 3: Mean Purchasing and Selling Prices (in Kg) of Dry Season *Okra* Marketers

| Market Dealers | Purchase Price | Selling Price | Marketing Margins (%) |
|-------------------------|----------------|---------------|-----------------------|
| <i>Okra</i> Wholesalers | 3,363.00 | 5,313.00 | 57.98 |
| <i>Okra</i> Retailers | 3,575.00 | 4,833.00 | 35.19 |

Source: Field Survey Analysis, 2011

Table 3 showed that the percentage marketing margin for *Okra* wholesalers recorded 58% margin than the retailers 35%. This result indicates that its marketing is a profitable business venture in the study area. It should be noted that transportation from the north during the dry season when little or no production takes place is indeed a rigorous experience, and can be said to contribute immensely to their margins. Moreover, it was also discovered that most of the commission agents were involved in the wholesale business; hence, contributing to their high margins. The percentage margin (93%) showed a higher percentage, and could imply that dry season marketing of *Okra* is more profitable than during peak production seasons. The result implied that a 1% increment in the purchase price of *Okra* at the wholesale and retail levels will virtually lead to an increase in selling price by 57.9% and 35.2% respectively.

4. Conclusion and Recommendation

Due to the huge supplies from the north, government should embark on the construction of railways linking the northern regions of the country to the south-eastern states. This will also drastically reduce the pressure of traffic on the roads. There is need as well as room for market intermediaries to improve their technical knowledge and skill in marketing through training, so that the marketing system will become more responsive to consumers' demand. Hence, this becomes a reality when extension education programmes are introduced to encourage marketing and also bring about improvement in their living standards. Analysis also showed that majority of the marketers expressed a need to form market associations, which will in turn lower transaction costs as well as bring about easy access to market information. With respect to this, *Okra* marketers should be encouraged to form their association.

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