

# A Comparative Analysis of the Market Structure of Two Varieties of Maize (*zea mays*) in South-east, Nigeria

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**Abstract** This study examined the market channels and structure of dry maize (*zea mays*) marketing in Southeast, Nigeria. Specifically, it described the roles and linkages of dry maize intermediaries and examined the dry maize market structure in the study area. Multi-stage sampling method was used to select three States (Anambra, Enugu and Imo), 15 Local Government Area (LGAs), 15 largest and busiest daily markets and 225 intermediaries (75 wholesalers and 150 retailers for the study) who were served with structured questionnaire to obtain primary data. Descriptive statistics, such as frequency distribution, flow chart and percentage were used to describe the market channels. The Gini coefficient was used to determine the market concentration or nature of competition in the market i.e. market structure. Four channels of dry maize were identified. Gini coefficient indices of 0.321 and 0.356 for producers/suppliers of white and yellow maize, 0.285 and 0.273 for wholesalers and retailers of white maize, and 0.224 and 0.198 for retailers of white and yellow maize reflected evidence of a competitive market. Government should provide necessary transportation facilities such as good network of roads and mass transit vehicles to ameliorate the transportation problems of the marketers, improve the distribution system and reduce unhealthy competition amongst the marketers.

**Keywords** Market channel, Market structure, Dry maize

## 1. Introduction

Agriculture is the bedrock of most countries of the world especially developing countries such as Nigeria. It contributes immensely to the Nigeria economy in various ways, such as the provision of food for the increasing population; supply of adequate raw materials and labour to the industrial sector; major source of rural employment opportunities; generation of foreign exchange earnings and provision of market for the products of the industrial sector [8]. In Nigeria, the agriculture sector contribution about 42% of the gross domestic product (GDP) and provides employment to more than 70% of the people especially those in the rural sector [6]. *One of the agricultural products that has contributed immensely to the country's economic growth is maize.*

Maize is a staple grain/cereal crop grown almost in all parts of the world. It is a high yielding cereal grown successfully under rain-fed environment and requires less capital. It has established itself as a very significant

component of the farming system and determines the cropping pattern of the predominantly peasant farmers [2]. This grain crop is used as human food, animal feed, as well as for industrial usage. It can be prepared in a variety of ways for human consumption such that you can hardly see a person who doesn't consume it in form or typology. Maize can be boiled, roasted or fried while industrially it can be processed to produce cornflakes, golden morn, quaker oat, custard, flour, beer and beverages, as well as animal feed. [14] noted that maize is one of the most abundant food crops in Nigeria; about 80% is consumed by man and animals while 20% is utilized in variety of industrial processes for production of starch, oil, high fructose, corn sweetener, ethanol, cereal and alkaline, consisting of 71% starch, 9% protein and 4% oil on a dry weight basis. On the same note, [7] noted that maize has immense potential to meet food requirement of human population because it has a great significance as human food, animal feed and diversified uses in a large number of industrial products.

Agricultural marketing is a form of marketing that encompasses all goods and services related to agriculture. Most producers do not sell their goods directly to the final users; between them stands a set of intermediaries performing a variety of functions. These intermediaries constitute a marketing channel (also called a trade channel or distributing channel). They are the pathway a product or service follows after production culminating in purchase and

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consumption by the final users [8]. [4] stated that marketing channel also called distribution channel is an organized system of marketing institutions and interrelationship that enhances the physical flow and ownership of goods and services from producer to consumer or business user. Market structure is defined as “the characteristics of the organization of a market which seem to influence strategically the nature of the competition and pricing within the market [7]. Market structure consists of the characteristics of the organization of maize market which seems to influence strategically the nature of competition and pricing within the market. The set-up of the market consists of the degree of concentration of maize buyers and sellers, integration, product differentiation and the degree of competition between the maize buyers and sellers.

### Statement of the Problem

The demand for maize sometimes outstrips supply as a result of the various domestic uses [3]. In Nigeria, the demand for dry maize is increasing at a faster rate daily thereby increasing its price. This may be due to the fact that grain is being used for feeding poultry and also serve as the main food for many household [13]. This widening demand-supply gap can also be as a result of the existence of inefficiency in the marketing system due to marketing problems such as poor market information, poor market structure, limited markets and large number of intermediaries, high cost of transportation, lack of capital, poor storage facilities. Dry maize marketing also depends on good transportation network for effective distribution to the wholesalers, retailers and customers especially during the peak season. The availability of market infrastructure like storage and transportation facilities, commercial marketing channels determine the ability of marketing system to effectively and efficiently perform its function.

### Objectives of the Study

The broad objective of this study is to compare market the structure of two varieties of maize in South East, Nigeria. The study specifically;

1. Examined the distribution channels of dry white maize; and
2. Described the market structure of dry white maize in the study area.

## 2. Methodology

The study area is the Southeast geopolitical zone of Nigeria. The states in the South-east geopolitical zone are Abia, Anambra, Ebonyi, Enugu, and Imo, States. Southeastern Nigeria lies between latitude 40 50'N to 70 10'N and longitudes 60 40'E to 80 30'E. In the study area, the mean minimum and maximum temperatures range from 21°-30°C in the coast to 29°C – 33°C in the interior. It spreads over a total area of 78,618 km<sup>2</sup>, representing 8.5% of the nation's total land area. The area has a total population of

16,381,729 million [11]. The area is inhabited by the Ibo race and *Igbo* is the native language, though English is widely spoken and used as official language in governance. They are predominantly Christians and agriculture is the predominant occupation mostly in the rural areas. Dry maize marketing is a common enterprise in markets in the five constituent States of the zone. Both yellow and white dry maize are marketed by the marketing agents. The state in the Southeast lies between latitude 40 50'N to 70 10'N and longitude 60 40'E and 80 30'E. It speaks over a total area of 26,982.67km<sup>2</sup> representing 8.5% of the nation's total land area with a total population of 16,395,555 million [11].

### Sampling Technique

The multi-stage sampling technique was employed for the study. In stage one, random sampling techniques was used to select 3 states (Anambra, Enugu and Imo) out of the 5 states in the Southeast, Nigeria. Stage II entailed purposive selection of 5 LGA, from the each of the selected states, thus making a total of 15 LGAs. The selected LGAs are Enugu North, Enugu South, Udeenu, Nsukka and Ude in Enugu State; Ihiala, Aguata, Nnewi North, Onitsha South and Onitsha North in Anambra State; and Owerri North, Owerri Municipal, Ezinifite, Oru West and Orlu in Imo State. The third stage involved the selection of the markets to use. Purposive sampling technique was used to obtain 15 daily markets from the sampled LGAs. The selection was based on markets that had a preponderance of dry white maize so as to enable researcher collect necessary data (Reported major markets by market participants).

Finally, simple random method was used to select five wholesalers and ten retailers from each of the selected markets to arrive at a sample frame of 225 respondents. Primary data were obtained using structured questionnaire administered. Data were collected on the various channels through which dry maize grains get to the final consumer, the size of the various intermediaries involved in dry maize marketing. Descriptive statistics, such as frequency distribution, flow chart and percentage were used to describe the market channels. The Gini coefficient was used to determine the market concentration or nature of competition in the market i.e. market structure.

### Model Specification

The Gini coefficient technique is given as:

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

Where:

G = Gini coefficient (number)

X = Marketing agents (number)

Y = Volume of trade (₦)

$\partial X$  = Cumulated proportion of marketing agents (population variable)

$\partial Y$  = Cumulated proportion of sales (volume of trade)

n = number of observations

k = n-1

### 3. Results and Discussion

#### Objective 1: Marketing Channel of Dry Maize in Southeast Nigeria

Most of the dry maize marketers do not sell their products directly to the consumers. This is partly because of the bulkiness of the products and its high costs. Between the producers and the consumers are the middlemen who perform various functions. The dry maize producers, middlemen and consumers link themselves. The linkage forms the marketing distribution channel. The marketing channel of dry maize is the path through which the dry maize product moves from the harvesters until it gets to the final consumers. This distribution channel is shown in Figure 1. Four channels of selling dry maize were identified in Southeastern Nigeria. The marketing channels identified were;

- i. Farmers/suppliers → consumers
- ii. Farmers/suppliers → wholesalers → consumers
- iii. Farmers/suppliers → retailers → consumers
- iv. Farmers/suppliers → wholesalers → retailers → consumers

The first channel indicated the movement of the product from the producer/supplier direct to the consumer. This

happened because maize is a staple crop in the Southeast and is grown by many households. Many households grow it for family consumption, but could as well sell in the nearby markets, directly to the consumers.

In channel two, the producer sold to the wholesalers, who also sold to the consumers. Maize, being a staple food in Southeast is consumed heavily by man and livestock hence farmers who have large livestock farms and institutions who consume maize in large quantities in form of pap and fufu, can afford to buy directly from the producers and wholesalers without passing through the retailers.

The third stage was producers/suppliers selling to the consumers via the retailers. This is true of some retailers who can afford the transportation means and costs and who have multiple stores in the markets. Many of them can also buy from many producers from the same village or locality. Finally, the fourth channel, which was the longest and the commonest in the study area involved the products sale flow from producers/suppliers to wholesalers to retailers and to the final consumer. Most of the bulk quantities of dry maize being consumed in the Southeast comes from the northern part of the country, and has to pass through the fourth channels before they get to the final consumers.

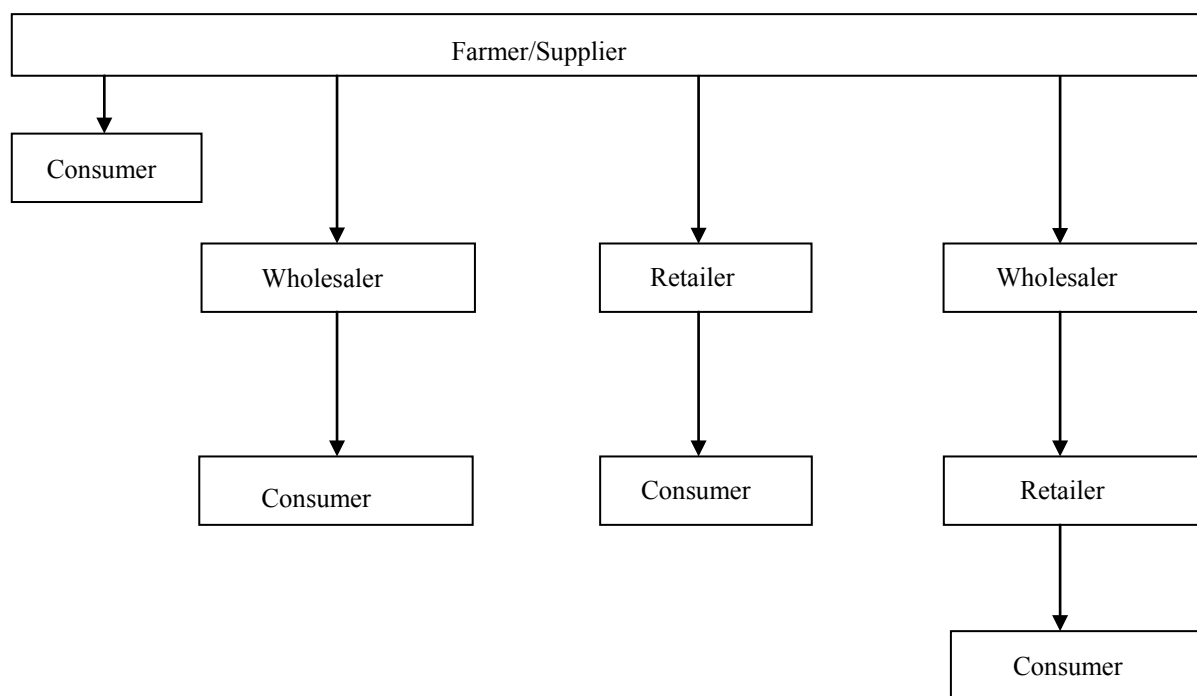


Figure 1. Marketing channels for dry maize in Southeast, Nigeria

#### Objective 2: Market structure of dry maize grains

Result of the analysis of market structure using Gini coefficient is shown in Table 1. It could be observed from the table that the index for producers of white maize was 0.321 while that of yellow maize was 0.356. These results showed that the concentration ratio for producers of the two varieties was low. This implied that no single supplier was able to

control a large share of dry maize supplied in the market. This also meant the existence of many dry maize suppliers in the market and none could influence the supply either by increasing or reducing the quantity being supplied thereby influencing price. It can also be observed from the table that the index for supplier of yellow maize is greater than that of white maize, implying a better market structure for white

maize producers.

Furthermore result of the analysis showed that the wholesalers and retailers of white maize and yellow maize recorded lower Gini coefficient of 0.285, 0.273; and 0.224, 0.198 respectively. The result implied that there were many wholesalers and retailers in the market such that none of them had control over the largest portion of total sales' volume at respective levels hence a fairly competitive market structure. However, the wholesalers of yellow maize recorded a lower Gini coefficient than that of white maize, thereby indicating a greater number of wholesalers of yellow maize than white maize in the markets.

**Table 1.** Estimated Gini coefficients of dry maize marketing agents in the South east

Marketing Agent	Gini coefficient	Stdev	Minimum	Maximum
Producer/Supplier <sub>w</sub>	0.321	0.124	0.241	0.331
Wholesaler <sub>w</sub>	0.285	0.177	0.186	0.297
Retailer <sub>w</sub>	0.224	0.089	0.114	0.282
Producer/Supplier <sub>y</sub>	0.356	0.094	0.230	0.380
Wholesaler <sub>y</sub>	0.273	0.137	0.201	0.294
Retailer <sub>y</sub>	0.198	0.110	0.120	0.290

Source: Field survey, 2016. Note: stdev = standard deviation. W= white maize. Y=yellow maize

## 4. Conclusions

Maize is very important in alleviating the food crises in Africa, however, factors like improper market structure and information, storage and transportation problems have been associated with low dry maize production and distribution. Undertaking this study is important, because it has established the difference in the market structure of white and yellow maize and also described the marketing channels of dry maize marketing in the area. These information will enable development institutions and government agencies at all levels to formulate policies and package programmes that will address the needs of people involved in marketing of dry maize.

On marketing channels and market structure of dry maize in the Southeast, the marketing channels ranged from zero to three level channels while the market structure reflected a fairly competitive market. This was indicated by the Gini coefficients of 0.321, 0.285 and 0.224 for producers/suppliers, wholesalers and retailers of white maize respectively, as well as Gini coefficients of 0.356, 0.273 and 0.198 recorded for the producers/suppliers, wholesalers and retailers of yellow maize respectively.

## 5. Recommendations

Based on the findings of this study, the following recommendations are made to improve the market structure of maize and other related products in the study area;

1. Transportation problem can be solved by the provision of good and accessible roads to ensure efficient distribution of dry maize.
2. More silos should be built to store maize and make it available all year round.
3. Greater access to market information results to increase on market awareness especially as it affects the prevailing prices in the market: therefore, establishment of information unit to propagate the day-to-day prices of the product is advocated.

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