

Warehousing Management Systems and Sales of Maize in Abia State, Nigeria

¹Uwaoma Ugochukwu G. A., ²Esi-Ubani Chidiadi Obinna, ³Emeh Prince Chinenye

¹Department of Marketing, Michael Okpara University of Agriculture, Umudike, Nigeria

²Department of Marketing, Abia State University, Uturu, Nigeria

³Department of Marketing, Abia State Polytechnic, Aba, Nigeria

Abstract: This study examined the influence of warehousing management systems on sales of maize in Abia State, Nigeria. A random sampling technique was employed to select 45 maize marketers. Simple descriptive statistics such as tables, frequency and mean were used to ascertain warehouse type mostly used among maize marketers. Correlation analysis was done to ascertain the relationship between warehousing and sales. It was observed that warehousing systems in the study area are lowly practiced and commercial warehouse were predominant in the study area as most maize marketers do not own their own warehouse. Cost of warehousing system is the major factor considered before choosing warehousing system to be practiced. The study recommends that maize marketer either as individuals or group through association should build or manage warehouses for their members with a consideration of its accessibility in terms of location. This will enable maize marketers utilize the opportunities that modern warehousing avails.

Keywords: warehousing, sales, maize, marketing.

1. INTRODUCTION

Maize is one of the most important staple food crops in Nigeria. Among the cereals, it has the largest area devoted to its cultivation (Onyibe et al., 2014). Indeed, its production area in the country continues to expand because of technological breakthroughs. Maize is a very important food crop for human beings and for livestock. It is the most dominant grain crop in the savannah zones and fresh vegetable in the forest belt where it is cultivated twice in a year. It has become an important irrigated crop and increasingly being used as a coping strategy against the ever worsening climatic anomalies throughout the country. Onyibe et al. (2014) maintains that over fifty million farmers grow maize every year while over ninety million people are employed in its processing and usage daily. Maize provides energy, vitamins and has some amount of protein. Output of maize continued to increase in Nigeria in response to demand. The livestock industry consumes more than half of the total maize production annually. During the era of Commodity Boards, the Nigerian Grains Board coordinated marketing of maize in Nigeria. With the scrapping of the Commodity Boards, no other institutional arrangement has been put in place for maize marketing until 2003, when the Arable Crops Marketing and Development Company (ACMDC) was established (Idachaba, 2004). The establishment of Arable Crops Marketing and Development Company was an integral part of the food security programme, which brought about the re-activation of the strategic grain reserve scheme. Eleleme (2010) observed that under the scheme about thirty-three silo complexes were built to support national food security stock. Maize constitutes about 70% of annual grains stock in the silos and 40% of the grains in food aids.

Storage is an important marketing function, which involves holding and preserving goods from the time they are produced until when they are needed for consumption. It is geared towards protection of the quality of perishable and semi-perishable products from deterioration to ensure a continuous flow of goods in the market. Didier (2013) emphasized that the nature of maize produce has placed a lot of emphasis on its storage process and possibly its warehousing. Prior to liberalization, farmers and marketers only stored maize for a short period, until they could arrange for delivery to the consumers (market). Currently farmers and marketers of maize have been faced with a wider variety of marketing

situations. The fact that products are not mostly consumed immediately they are produced has given chance and opportunity for marketers to bridge this gap (Emeka, 2014). If there is demand, they can sell their maize immediately and not worry about storage but when there is no demand then they have to store their maize until such a time when buyers will demand for it. Moreover, marketers may deliberately want to hold on to their maize for some months in the hope that the price will rise. In post Second World War period, the general trend for the supplier has been to store the goods in order to meet the demand in the market which is always fluctuating. The delivery time has been very essential tool for the businesses as marketing techniques and this is the part distributors' play which in return they make profit from. The idea has been to provide shorter lead times instead of reducing the price in order to attract the customer (Robson and Keller, 2008). Recently, storage requirements have changed significantly from the days when the farmer or marketer only had to worry about storing maize for the following season but need to store larger maize produced in a good and big warehouse for time of scarcity where its price can rise (James, 2012). Before now a local variety of maize was stored on cob, without use of pesticides, in an open store. However, maize for marketing is now mainly hybrid maize which, because of its shorter and looser husks, should ideally be stored and shelled in a closed store with the use of pesticide and stored in a big store room, which is warehousing.

Statement of the problem:

Maize as earlier identified has economic importance and also contribute a lot in providing food security in a given economy. Lots of persons have over the years gone into marketing of maize but could not succeed which could be as a result of many factors including lack of storage facilities as well as having good understanding on how to warehouse the produced maize. Access to storage technology remains one of the most problematic issue in the marketing of maize because devastating pests such as the Large Grain Borer (LGB) can cause up to 30 % dry –weight-losses (DWL) in six months of storage (Boxall, 2002; Gollob, 2002). In addition, when effective storage technology is not available, traditional storage technologies are often unable to dry and store grain properly and can even lead to increased losses during storage (Gollob et al., 2002). More so, when a chocked storage facility is used it will reduce the quality or form at which the consumer will be ready to buy the product irrespective of the price. Unfortunately, farmers and marketers are limited in strategies to cope with storage losses because of credit constraints (including high cost of capital), risk aversion, lack of modern storage technology and warehousing techniques. Warehousing as important as it is, consideration of where, location, techniques, inventory system and space capacity of a warehouse has become sacrosanct for storage of maize due to its perishability nature. Understanding its perishability and using some methods in selling of the produce (maize) is also vital to the success of marketers in the business of maize. Having identified these challenges and problems in these areas of maize marketing, the researchers therefore seek to study and understand warehousing practices that can give a maize marketer a better advantage in marketing maize products in the study area.

Research questions:

The following research questions would guide the study

- i) What type of warehousing systems is mostly used among maize marketers?
- ii) What nature of relationship exists between warehousing systems and sales?

Objectives of the study:

The broad objective of the study is to examine the relationship or otherwise between warehousing management and sales of maize in Abia State, Nigeria. The specific objectives are to:

- i) identify the warehousing systems common among maize marketers in Abia State.
- ii) ascertain the relationship between warehousing systems and sales of maize.

Significance of the Study:

The economic importance of maize cannot be over emphasizing both in the developed and developing economies. Every business is geared towards profit for sustainability. In view of the above statement, it becomes imperative to understand the intricacies of marketing maize. This involves bridging the time, place, form and delivery utility that place (distribution) in marketing offers.

Warehousing being a good tool used to bridge time, place, and form and delivery utility gap in distribution was explored in this work. Farmers and marketers of maize will benefit from the various storage methods and areas identified in this study. More so, warehousing operators will also be exposed to better ways of storing cereal products such as maize.

Students who are also studying in the related discipline such as marketing, finance, business administration, entrepreneurship, accounting and agribusiness shall find this research work very useful mostly as relevant literature in related studies.

Scope of the Study:

This study is concerned with warehousing systems and the sales of maize in Abia State, Nigeria. Warehousing and storage in regards to maize are the focal point of this work. Abia State has three senatorial districts. This work covers the three senatorial districts. Factors that affect sales and profitability were ascertained, problems peculiar to these maize marketers were identified and the relationship that exist between storage, warehousing and sales volume. The study was restricted this area because of the fact that maize is one of the fastest growing and highly competitive cereal foods in the market.

2. LITERATURE REVIEW

Conceptual View of Warehousing:

Warehousing is basically a function of storing goods in between the time they are manufactured and the time they are delivered to the customer. Philip and Smoth (2014) said that in practice, the goods are produced in long production runs and they are transported to in large lots to the storage areas or warehouses closer to the market. Storage is the basic function of warehousing as highlighted by Smritiri (2015). Surplus commodities which are not needed immediately can be stored (keep it) in warehouse. They can be supplied as and when needed by the customers. Warehousing refers to the holding and preservation of goods until they are dispatched to the consumers. Generally, there is a time gap between the production and consumption of products which is the gap that brought the marketer into business. By bridging this gap, storage creates time utility (Salo and Coe, 2000).

Maize increase agricultural productivity and incomes especially for small holder farmers, also encourages diversification into non-traditional agricultural commodities and value addition to reduce vulnerability.

Maize is an annual plant with high productivity which also enjoys exceptional geographic adaptability, therefore needs to be stored or warehoused for times when it may be highly demanded (James, 2012). Food security is jointly determined by availability of food and accessibility to the food. Availability of food is a function of food production, stock holding and marketing (Von Braun et al, 1992). Certainly by raising agricultural productivity, (i.e increase the land area planted and increase yield per hectare), food availability could be increased. However, availability is not enough. The food produced must be distributed efficiently at minimum costs in-order to guarantee continuous availability of the food. This is the subject of marketing. Olayemi (1982), observed that agricultural marketing is important but sometimes it is been neglected as more emphasis is usually placed, by government on policies to increase food production with little or no consideration on how to store and distribute the food produced efficiently and in a manner that will enhance increased productivity.

Since maize is a season produce, moving the material flows in the supply chain becomes important in the areas of necessary supplies, storage for dedicated storage (Kondriatjev, 2015). Movement through the warehouses have cost of labour and materials which increases the cost of goods and services. In this regards, warehouses has a significant impact on the rationalization of movement of material flows in the distributors supply operation, the use of vehicles and distribution cost (Limba and Herold, 2002). Eme (2013) stressed that warehouse should not be considered in isolation but as an integral component of supply chain. Michael (2013) opined that products warehoused are mostly warehoused to satisfy place utility as well as time. Several authors such as Ahmed and Rustagi, (1987); Madel et al., (2014); Kondriatjev, (2015), had written on the better ways to ensure food security which included marketing techniques as a good model.

At the marketing level, warehouse help to balance the supply and demand of Agricultural products, thereby stabilizing market prices at the Agro-Industrial level. It guarantee regular and continuous supplies of raw-materials for processing industries; which also ensure availability of seeds for the crop cycles to come at the agricultural and permit deferred use of the agricultural product harvested. There is need for storing the goods so as to make them available to buyers as and when required. Chand (2003) believed that some amount of goods is stored at every stage in the marketing process. Proper and adequate arrangements to retail the goods in perfect condition are essential for success in marketing. Limb (2003) said that storage enables a firm to carry on production in anticipation of demand in future.

Functions of Warehousing:

Manol and Brode (2014) infer that any distributor that lacks the resources to have good storage facilities will not stay long in a distribution competitive environment. Smriti (2015) observed that lots of activities are involved in storage. He emphasized that the main function of warehousing is storage and advised that a good distribution manager must not ignore other activities required to make the storage aim efficient and effective on the overall objectives of logistics. Prince (2012) listed the functions of warehousing as:

[a] Price Stabilization

Warehouse play an important role in the process of price stabilization. It is achieved by the creation of time utility by warehousing. Fall in the prices of goods when their supply is in abundance and rise in their prices during the slack season are avoided.

[b] Risk bearing

When goods are stored in warehouses they are exposed to many risk in the form of theft, deterioration, exploration, fire etc. Warehouses are constructed in such a way as to minimize these risks. Contract of bailment operates when the goods are stored in warehouse. A warehouse keeper has to take care of the goods and safeguard them against various risks. Hample (2011) state that any loss or damage structured by goods, warehouse keepers shall be liable to the owner of the goods.

[c] Financing

Loans can be raised for the warehouse keeper against the goods stored by the owner. Similarly, banks and other financial institutions also advance loans against warehouse receipts. In this manner, warehousing acts as a source finance for the businessmen for meeting business operations.

[d] Grading and Packing

Warehouses nowadays provide the facilities of packing, processing and grading of goods. Goods can be packed in convenient sizes as per the instructions of the owner.

Types and Importance of Warehousing in Marketing:

Warehousing or storage refers to the holding and preservation of goods until they are dispatched to the consumers. Generally, there is a time gap between the production and consumption of products which is the gap that brought the distributor into business. By bridging this gap, storage creates time utility (Salo and Coe, 2000). The importance of warehousing in the distribution centre is to satisfy time and space utility. Efficient and effective warehousing will assist a distributor design its supply strategy and handle effectively other overheads and other costs of its business (Mike and Cruz, 2013). Lucky and Magnus (2010) are of the view that manufacturing firms should attach professional logistics experts to handle inflow and outflow of the firms goods. According to Kotler (2004), a distributor must have enough space layouts where goods can be stored for the purpose of responding to demands as demands and supply often varies pending the circumstances. With a good warehousing management system an organization will respond quickly to its customers, reduce price, reduce risk have a better financial status and grade and park their products in convenient sizes its customers (Scritiri, 2005). Traditionally, warehousing continuously is declining since the last decade of the 20th century with the introduction of Just – in – Time (JIT) techniques which are specially designed to enhance the return on investment (ROI) of a business by mitigating in – process inventory (Mahash et al, 2009). Just in time (JIT) concept is based on delivery product directly from the factory to the retail outlet without the use of warehouse, but in some cases like offshore outsourcing and off shoring in about the same time period, the distance between manufacturer and the retailer increases considerably in many regions which builds the need of at least one warehouse per region or per country for a given range of products in any typical supply chain (Tompkins, and Smith, 1998).

Recent developments in marketing filed have led to the development of warehouse designing style, where the same warehouse is used for warehousing and also a retail store. These types of warehouses are equipped with tall heavy duty industrial racks, with the items which are ready for sale are placed in the bottom parts of the racks and the palletized and wrapped inventory items being usually placed in the top parts (Maharsh et. al, 2000). In order to meet customers' requirements, activities in the warehouse and warehouse equipment need to be properly coordinated and maintained

(Cooper and Mathew, 1984). There is need for storing the goods so as to make available to buyers as and when required. A warehouse is a place used for the storage or accumulation of goods. It may also be seen as establishment that assumes responsibility for the safe custody of goods (Efeme 2013). Warehouse enables the business man to carry on production throughout the year and sale their products whenever there is adequate demand.

Kotler (2004) maintain that need for warehouse arises because some goods are produced only in a particular season but are demanded throughout the year. Similarly, certain products are produced throughout the year but demanded only during a particular season.

Onochie (2000) noted three classes of warehouses such as private warehouses, public warehouses and bounded warehouses. Private warehouses are owned and operated by distributors and big manufacturers and merchants to fulfill their own storage needs. A big manufacturer, wholesaler or distributor may have a network of his own warehouses in different parts of the country.

Duru and Stone (2008) aver that a public warehouse is a specialized business establishment that provides storage facilities to the general public for a certain course. It may be owned and operated by an individual or a comparative society. It has to work under a license from the government in accordance with the prescribed rules and regulations. Michael (1999) sees public warehouse as duty – paid warehouse. Public warehouses are very useful to the business community. Most of the business enterprises cannot afford to maintain their own warehouses due to huge capital investment involved.

Cruz and Mune (2009) defined bounded warehouse as licensed by the government to accept imported goods for storage until the payment of custom duty. These types of warehouses are mostly located near the ports. They are either operated by the government or work under the control of custom authorities. Human being has been in business and commerce from several thousand years in one way or the other. Makami (2014) said that it is only the last twenty years that there has been a very drastic advance in the science of warehousing. In the present competitive world, the new warehousing ideas are becoming obsolete by the time the infrastructure is being arranged to implement the new ideas. This is the phase of the warehousing industry nowadays in which an organization should strive to be more efficient and effective than the other competitors. Eleleme (2010) suggested that based on the increase in technology in this contemporary era that implementations of some sophisticated technologies in warehousing management will be more effective in order to stay in the competitions.

3. METHODOLOGY

Research Design:

This deals primarily on the method adopted in carrying out the research, the method of data collection, analytical tools, population of the study and sample size among other sub-topics. The study adopted survey design research as the opinions of the respondents were elicited in the research process.

Study Area:

This study was carried out in Abia State. Abia is one of the five states that make up the South East geopolitical zone of Nigeria and it is located between longitude $04^{\circ} 45'$ and $06^{\circ} 17'$ North and latitude $07^{\circ} 00'$ and $08^{\circ} 10'$ East. The state bounded by Imo at the Western border, Ebonyi and Enugu States at the North; cross Rivers and AkwaIbom States at the South. The population stood about 2,883,99 persons with a relatively high density of 580 persons per square Kilometer (NPC, 2007). Abia has seventeen (17) local governments comprises Aba South, Aba North, Arochukwu, Bende, Isiukwuato, Obingwa, Umunochi, Osisioma, Ukwa West Ukwa East, Isialangwa South, IsialaNgwa North, UmuahiaNorth, Umuahia South, Ugwnagbo, Ohafia and Ikwuano. Abia State has two notable towns which are Aba and Umuahia and there are maize marketers in the major markets in Abia State mostly in Umuahia and Aba. One of the common occupations of the people of Abia State is farming and trading as it is predominate by Igbo speaking tribe.

Population of the Study:

The population for this study consists of all maize marketers in Abia State. Maize marketers are of two group in Abia State. Eleleme (2010) grouped them between maize producers and maize marketers and these groups are found in Abia State. Where the producers are seasonal, the marketers are not. Maize marketers in Abia state do not have registered association as such the population is not finite.

Sample size and Sampling technique:

Multi-stage-sampling techniques was used to select maize marketers' in Abia State. Since the population is not finite, a random sampling was used to select 45 maize marketers in three senatorial district of Abia state, which are Abia North, Abia Central and Abia South. The sample size for this study is 45 maize marketers. This number was arrived at by selecting 15 marketers from each of the three senatorial districts in Abia State.

Sources of Data:

Primary source was in gathering data for this study. This was achieved through observation and distribution of copies of questionnaire to the respondents.

Methods of Data Analysis:

The primary data gotten from the respondents was analyzed with descriptive statistics such as tables, frequency and percentages (%) and correlationMatrix, models. However, objective (i) was analyzed using descriptive statistics such as tables, percentages and frequency while objective (ii) was analyzed using Correlationmatrix.

Model Specification:

The model used to ascertain the nature of relationship existing between warehousing systems and sales is stated thus

$$r = \frac{n \sum xy - \sum x \sum y}{\sqrt{[n(\sum x^2) - (\sum x)^2] - (n \sum xy)^2 - (n \sum y)^2}}$$

Where

- r = Correlation coefficient
 x_1 = Warehousing (Quantity of goods in storage)
 Y = Sales Volume (Number of sales)
 n = number of respondents

4. DATA PRESENTATION, ANALYSIS AND INTERPRETATION

The analysis was done based on objectives. The results of the analysis done on data obtained for this study are presented and discussed below.

Objective 1: *Identifying Warehousing systems common among maize marketers in Abia State , Nigeria.*

Table 1: Distribution on Warehouse/warehousing systems common among maize marketers in storing their goods in Abia State, Nigeria

Warehouse type	Frequency	Percentage
Private warehouse	9	20
Public/commercial Warehouse	36	80
Bounded Warehouse	0	0
State Warehouse	0	0
Warehousing system applications		
Uses Computer	6	13
Uses other electronic devices	8	18
Uses Manuel	31	69
Factors mostly considered when choosing warehouse type		
Cost	45	100
Space	16	36
Quantity of goods	29	64
Place(location)	39	87
Warehouse ownership		
Yes	8	18
No	37	82

Source: Computed from field survey, 2018.

Results in table 1 shows that private warehouse users among maize marketers were 9(20%). Public warehouse users were 65(80%) while bounded and state warehouse has no maize marketer that applies it. This implies that majority of maize marketers use public/commercial warehouses to store their product probably because majority of them do not own any warehouse. Maize marketers in the study area 6(13%) applied computer in storing their goods. Other warehousing electronic devices use by maize marketers have 8(18%) while 63(85%) are the number of maize marketers that use manual methods to store their goods. This simply means that warehousing activities are mostly done in the study area with manual labour which also entails that modern technologies in warehousing goods are still lowly practice amongst maize marketers in the study area.

With a multiple response, result showed that maize marketers considered cost, location, quantity of goods to be stored and space respectively before choosing the type of warehousing system to operate. Cost has 45(100%) while location has 39(87%). Quantity of goods to be stored has 29 (64%) while Space has 16(36%) responses. The implication of these results is that maize marketers have various factors they considered before choosing a warehouse type. These factors can be said to be considered according to the objective of the maize marketer but the most and paramount considered among maize marketers is the Cost of either hiring a warehouse or adopting a particular system of warehousing. This simply means that maize marketers are very much sensitive to cost attributable to warehousing operation.

The results further reveal that 8(18%) maize marketers owned warehouse while 37(82%) do not have warehouse of their own. This result reveals the reason behind cost playing a paramount role in the choice of warehouse type and systems the maize marketers operate. Since most of them do not have a warehouse of their own, they will likely choose a warehouse that is less costly irrespective of the facilities in the warehouse nor the location as well as the quantity. This also explains why warehouse modern technology have not been properly used amongst maize marketers in the study area, probably because they are not the owners of the warehouse they operate which means that in attempt to use modern technology they will incur additional cost.

Objective 2: *Ascertaining the Nature of Relationship existing between warehousing and sales of maize in Abia State.*

Table 2 Correlation Matrix showing the nature of relationship between warehousing and sales of maize marketers

	Sales	Warehousing
Sales	1.00**	0.612**
Warehousing	0.612**	1.00**

Source: computed from field survey, 2018.

Using spearman correlation matrix to show the nature of relationship between warehousing and sales in the study area shows a linear positive relationship. This implies that an increase in the quantity of goods in the warehouse will increase sales volume of maize marketers. This result corresponds with Njikonye (2008) findings that application of modern techniques helps to stabilize sales and meet up with customers' demands. The coefficient was statistical significant at 1%.

5. SUMMARY, CONCLUSION AND RECOMMENDATION

This study examined the relationship between warehousing management and sales of maize in Abia State, Nigeria. Most marketers store their goods in commercial warehouse which is as a result of the inability of most of the maize marketers to have their own warehouses. Modern techniques that will facilitate storing and packing of maize are not properly enhanced as manual means are mostly applied which is as a result of most maize marketers inability to own warehouse and in the case they may want to do so they will incur additional cost. Cost showed to be one of the major factors operators of maize marketers considered before embarking on the choice of warehouse and warehousing management systems to operate. Space and location were respectively considered as well as quantities of goods before making choice of the type of warehouse type/warehousing systems to operate. Apparently, maize marketers considered any of these factors (Cost, Space, location, and quantity of goods) based on the objective of a maize marketer since the differences between these factors were not much.

With a spearman correlation coefficient, result showed that there is a relationship between warehousing management system and sales volume. The result was statistical significant at 1% level. The result simply indicates that effective warehousing management systems will have a positive influence on the sales of maize marketers in the study area.

Based on the major findings of this study, it can be concluded that the maize marketers have not yet optimized the opportunities brought by advanced technologies in warehousing due to lack of warehouse ownership amongst maize marketers in the study area. Cost actually played major role among these marketers of maize in their choice of the warehouse type and system to operate. Other corresponding factors in the choice of warehouse type and warehousing systems such as space, quantity of goods to be warehoused, location of the warehouse to be either hired or use, and the space of the warehouse. These factors are considered based on the objectives of a maize marketer and the marketing environment.

One of the major tasks of maize marketers is warehousing and it is very competitive. Modern warehousing techniques has not been fully implemented as most of the maize marketers still using manual means in receiving, parking, grading, and storing their products. Based on the findings of the study, the following recommendations are made:

- a) Maize marketers in the study area should do well to apply modern techniques in their warehousing practices.
- b) Maize marketers should strive to own a warehouse of their own as that will avail them the opportunities that modern warehousing system offers.

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