

Storage facility development and marketing of grains in the states of the North of Nigeria

Avanenge Faajir

Department of Business Management

Faculty of Management Sciences.

Benue State University Makurdi, Nigeria – West Africa.

Keywords

storage facility, grains, marketing, Nigeria

Abstract

This paper takes a cursory look at the effects of storage facility development on marketing of grains in selected states of the North of Nigeria. Additional storage facilities are anticipated to increase marketing flexibilities in major grains producing states. Using descriptive research design to achieve the objective of the study, data was collected from a stratified random sample with the help of the questionnaire. Highlights of findings shows that in marketing of grains in selected states of the North of Nigeria, Certain uncertainties are encountered. These uncertainties in grains marketing include, poor storage, damages, poor quality of grains and so on. The hypothesis formulated for this study was tested and conclusion drawn that significant relationships exist between storage facilities and marketing of grains in selected states of the North of Nigeria. To solve the problem of storage facilities, the study recommended that, more grain silos be constructed, improved storage facilities be provided for farmers to store their grains if the objective of effective marketing of grains is to be achieved.

1.1 Introduction

Nigeria is one of the most populous countries in Africa with a land Mass area of 24,000 square Kilometers. It is a country of great density inhabited by various ethnic, religious and linguistic groups. Nigeria has a very low Per Capital income derived primarily from agriculture. According to statistics available, Ada and Faajir (2010), the rural dwellers in the country constitute product (GDP) most of the People take on occupations like subsistence farming and petty trading. They lack basic infrastructure such as good road, access to clean water, electricity supply, and good storage facilities such as lock up stores, silos barns in most of the markets.

Great losses are recorded in grains such as millet, sorghum, rice, cowpea, and so on. Market information is inadequate and as such, sellers and buyers of grains who are, middlemen, livestock farmers, industries, households, beverage companies are not well informed about the sources of supply thereby reducing the potential efficiency of the market.

1.2 Statement of the problem.

Grains produced must be distributed efficiently at minimum cost in order to guarantee continuous availability. Olayemi (1982) observed that grain marketing is very important but rather a neglected aspect of agricultural development and marketing. Emphasis are placed more on policies to increase production of grain with little or no consideration on how to distribute it, this in effect is a problem. A number of distribution problem exist. These problems are those of storage, waste measuring units, transportation and so on. All these constitute problems that this papers set out to investigate.

1.3 Objective of the study.

The objective of this paper is to examine storage facility development and marketing of grains in the states of the north of Nigeria.

1.4 Research question

Is there a significant relationship between storage facility development, and marketing of grains in the states of the north of Nigeria?

1.5 Research Hypothesis.

Based on the objective of the study, and research question, this hypothesis, is formulated.

- i. There is no significant relationship between storage facility development and marketing of grains in the states of the North of Nigeria.

1.6. Significance of the study.

This paper is relevant not only to grain marketing in Nigeria but also to business marketing generally. It is relevant because it will uncover the salient issues affecting the growth, development and marketing of grains in the states of the north of Nigeria.

It will also provide empirical evidence with respect to the state of the art on marketing of grains in Nigeria considering the fact that Nigeria has a highly diversified agro-ecological condition which makes it possible for the production of a wide range of agricultural products.

The research among others will offer recommendations that will serve as antidote for effective and efficient marketing of grains and other agricultural products produced in Nigeria.

2.1 Literature Review.

The section attempt to identify, locate and review literature previously conducted on the important variables of this study.

The review is basically aimed at providing a good knowledge of the state of the art with respect to marketing of grains in Nigeria.

The American marketing Association has defined marketing as the activity set of institution and processes for creating, communicating, delivering and exchanging offerings that has value for customers, clients, partners and society at large.

Concept of Marketing:-

The marketing concept is the philosophy that firms should analyze the needs of their customers and make decisions to satisfy those needs better than the competition.

According to the business Dictionary, marketing concept is the management philosophy according to which the firm's goals can be best achieved through identification and satisfaction of customers stated and unstated needs and wants.

Kotler 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 identify unfulfilled needs and desires it defines measures and quantities the size of the identified market and the profit potential. It pinpoints which segment the company is capable of serving best and it designs and promotes the appropriate products and services.

Marketing is the message that causes actions and actions that causes messages.

Market infrastructure such as wholesale, retail and assembly markets and storage facilities is essential for cost efficient marketing, to minimize post-harvest losses and reduce health risk. Market infrastructure is required at all stages of the supply chain, from local retail and assembly markets through to wholesale and retail markets in urban centres. Governments local authorizes generally have a poor application of the importance of markets and a reference to risk in them. As a consequence, markets are often congested, unhygienic, and inefficient. They are also fire risk; local authorities frequently see markets as revenue raising opportunities, not as institutions that necessitate investments. Although there have been significant developments with regards to supermarkets developments and the improvement of farm to agro processor linkages, the great bulk of food products are still distributed through more traditional channels using traditional ,markets infrastructure. Considering the situation in the states of the north, grains' marketing has suffered a lot due to the absence of infrastructure. Market efficiency has been achieved. A few example of storage facilities are hereby presented for more information.

According to Adejumo and Raji (2007), storage is an important activity which enhances marketing efficiency by providing utility. Storage is particularly important in agriculture because agricultural production is seasonal which demand for agricultural commodities are more evenly spread throughout the year. In these circumstances, there is need to meet average demand by storing excess supply during the harvesting season for gradual release to the market during off- season periods. In this process, seasonal prices are stabilized.

Postharvest facilities or appropriate storage technology has been the major problems of Nigerian of agriculture for a long time. This has resulted in considerable loss to the economy. According to Olumeko (1999), Nigeria is losing about 2.4 billion tons of food yearly to poor harvest and storage facilities. The losses are mainly in Maize, Rice, Sorghum, Millet, Cowpea, Soya beans and so on. In monetary terms, Nigeria is looking more than a total of 48 billion annually on post-harvest losses. It has been observed that different localities in states of the north have peculiar storage methods depending on the types of crops grown (Adesida, Adeyumo and Raji 2007).

In Nigeria and particularly the north, the average proportion of food production retained by farmers for their own consumption is usually assumed to be 70% (Adejumo and Raji 2007). However, there is a high degree of variation reflecting among other factors, the size of holding, the interaction of consumer pattern with cropping patterns, level of indebtedness from the labour payment. In the north Grains, kept in farmers structures are mainly for household consumption, any surplus grain to consumption requirements may be sold within two or three months of harvest. After harvest, grains may be stored temporarily in bulk or bags for a month or two before being transferred to a structure.

The traditional grain storage structures in different states of the north of Nigeria are made of varying locally available materials. Usually, the type of locally available materials indicates the type of structures. The structures are made of paddy straw, split or whole bamboo poles, palms, reeds robes, mud brick and so on. Most structures are constructed at the beginning of the harvesting season. Grains are stored either in threaded or threshed forms.

Types of Grains Storage Structure in Northern Nigeria

A number of grains storage structures exist in the states of the north of Nigeria. We shall examine a few of them.

Mud rhombus

A mud rhombus is a specially built structure made from a mixture of dry grass and clay. It consists of a bin resting on large stones and covered with a thatched roof plate.

A mud rhombus consist the following

- (i) Foundation – floor assembly
- (ii) Shell or wall
- (iii) Roof

Storage Practices

Loading of grains into mud rhombus is done by the removal of the roof, since no appropriate design for loading and unloading is included. The major crops found to be stored in the areas investigated are unthreshed millet and sorghum. It was learnt that the crop is stored for a minimum of two years and maximum of between 7 and 10 years. The unthreshed crops are brought from the farm in bundles tied with ropes. The bundles are of the same size with four bundles giving approximately 100kg of threshed grain., where the millet is to be stored for a duration of one year less, the bundles are not loosened, but stacked in the rhombus where however, the storage is to be a longer duration, the bundles are loosened and put into the bin by special arrangement carried out by 4 to 8 people depending on the size and the height of the rhombus. The first person stays on the ground, loses the bundles and passes it to the 2nd person who is on top of the bin or on the ladder. The 3rd person who is inside the rhombus or on another ladder inside the rhombus collects the millet heads and together with the 4th person known as the good had arranges the millet heads in the structure.

The man referred to as the good hand is a person believed to be naturally disposed to storage, such that when he stores a product, minimum deterioration occurs compared to other people. In arranging the millet heads, the good hand arrange them in a concentrically over locking pattern, such that the millet are self-supporting in a way. After about 30 to 40cm depth of storage 3 or 5 other men climb into the structure and together with the 2 men already inside, the stored product is compressed. This procedure is continued until the bin is filled to the brim; the roof is the lifted and put in place. After about 3 to 4 weeks, the rhombus bin is inspected for settlement. Settlement is the setting of the stored millet mass by virtue of its self-weight resulting in both the reduction of depth of storage height and width. When about 5cm reduction in depth with a corresponding gap of about one or two centimeter between stored millet and rhombus shell is observed, the storage is considered good, the mouth of the bin is then sealed with a mud disc and the roof put in place.

Unloading of the stored crop could sometimes become difficult and cumbersome because of the above loading procedure. In large capacity rhombus bin part of the shell may have to be broken to create an opening for easy off-loading, the created opening is later sealed after complete evacuation of stored products.

Grain damage or losses in crops stored in mud rhombus include change in taste, colour and odour, pest infestation. The damage often results from pest or insect infestation, structural failure, variation in climatic conditions, micro-organisms among others. The losses in grain and economic values are between 10 - 20% during a storage period of 6 months to 3 years the end use of the stored grains are for home consumption and sales.

Thatched Rhombus

The thatched rhombus is made of woven grass stems resting on irregular stores and or tree stems. They are usually cylindrical or circular in share with various capacities. The capacity ranges from 500kg - 8, 000kgs depending on the size. The grains are usually stored in unthreshed forms. They are generally not airtight, moisture and rodent proof. Construction cost is between N2, 000 and N8, 000. They usually have external support ranging from 6 - 16 units depending on the size of the rhombus.

Foundation Floor Assembly

The foundation - floor assembly is usually made of irregular stones and tree stems or tree poles stems penetrating the ground, and crosses with other tree stems. The elevation is generally low. It ranges between 100 mm and 600 mm, no rodent guard provided only very few rhombus has thorn used rodent guard.

Wall

The wall of the thatched rhombus made of woven grass stems has two layers, being reinforced with two or three tension rings, and some villages in Kano states, cow or animal dung in between the two layers to prevent farm animals from eating -up the wall of the rhombus. 6 - 16 trees stems depending on the size of the rhombus support the walls externally. The support usually does not penetrate the ground.

Roof

The roof of the thatched rhombus is usually conical in shape. The materials usually used for the roofs are straw or thatched, tree stem, polyethylene sheets, and robes. They are usually of 2-3 layers to prevent water seepages.

Types of Defects

Physical defects are usually on the wall, foundation and roof. The defects includes inadequate support, low elevation, termite infestation which are as a result of poor strength of material structural failure, inadequate design, of the foundation and of the structures maintenance cost range between N500 and N3, 000 depending on the locally, capacity availability of materials and extent of damage.

Storage Losses or Damage in Thatched Rhombus

The loading is usually done through the roof and is the same as that of the loading of the mud rhombus. Grains are usually stored in unthreshed form and they include millet, sorghum and maize. Fumigants are usually applied, but are usually not effective because the structure is not alright. The type of grain loss includes change taste, colour, and odour, pest infestation. The extent of loss depends on the duration of storage. The main causes of losses include pest infestation, poor strength of material, and structural failure among others. The percentage loss in quantity and economic value ranges between 10% and 20% and above respectively, which depends on the duration of storage and other factors of deterioration.

Thatched or Sorghum Stalk Rhombus

This type of rhombus has the stone – grillage foundation – floor assembly, the wall has 2 layers of woven grass stem and a wall arranged sorghum stalk held in place by local robes.

Underground Pit

This is commonly found in Bornu and Yobe States where the water table is low. The pit, which may be round or square in cross section, is 1 -3m deep and 1- 3m in diameter or square. The underground pit is usually line with straw mat are padded with 40 – 60cm of cornhusk. Also, a layer of husk padding or insulation is provided at the bottom of the pit. The common types of grain stored are millet, sorghum and cowpea; they are stored in threshed from. The capacity ranges from 1000kg – 6000kg and above. After loading the grains into the pit, tree stems are placed across the it then covered with polythene or metal sheet.

The layer of a husk before finally layers of sand or laterite is used to cover it. The duration of storage could be between 1 and 5 years without opening and usually, once opened all the content must be emptied. The same site can be used for up to 12 years with annual re-digging. The location of defect is usually done by cleaning and replacement of the wall lining. Maintenance cost dependent on the locality and availability of material.

The damages of loses in stored grains includes change in colour, odour and taste. It is believed that these grains have low viability. Grains stored in this structure are protected against insect attack because of reduced oxygen level. Causes of grain damage or loss include microbial organisms, structural failure and changes in the chemical composition of grains. Approximately percentage losses of quantity economic values are 10 – 20% respectively. The underground pit is easy and cheap to construct and requires minimum materials, but however great difficulty is experienced in emptying and cleaning the structure.

3.1 Methodology

The study uses the survey design. A total population of registered farmers is 6,000. This figure is obtained from National Cereals Research Institutes (NCRI). Sample size is determined qualitatively using the Yamane formula as Captured in Eboh (2009).

$$\text{Thus } n = \frac{N}{1 + N(e)^2} = \frac{6000}{1 + 6000(0.5)^2} = 375$$

Total sample size = 375 + 385 + 385 = 1145

Data generated or presented in tables and while the hypothesis formulated was tested using regression analysis.

The model here is GM=F (mif). Where GM= Grain marketing, MIF= market infrastructure.

4.0 Results and Discussions

Mean rating of Respondents on market infrastructure.

S/N	ITEMS	MEAN	RANK ORDER	REMARK
-----	-------	------	------------	--------

1.	Good storage facilities like lock - up store, Silos, Barns are lacking	3.75	1 st	Significant
2.	Insufficient storage facilities often lead to grain losses.	3.71	2 nd	Significant
3.	Market information is lacking	3.75	1 st	Significant
4.	Lack of information reduces potential efficiency in the market.	3.0	6 th	Significant
5.	Clean market environment is lacking	2.9	7 th	Significant
6.	Communication facilities is lacking	3.2	5 th	Significant
7.	Health facilities are lacking	3.6	4 th	Significant
8.	Security facilities are lacking	3.6	4 th	Significant
9.	Water supply, good toilets facilities which contribute to efficient grain marketing are lacking.	3.7	4 th	Significant

Results in the table above shows overall mean seal rating of 3.4.6. This overall results show that market infrastructures are grossly lacking in all the markets in states of the North of Nigeria. On the basis of individual items, items (1) and (3) received the highest mean rating of 3.75 these scales are significant. This implies that good storage facilities are lacking as well as market information item (2) received a mean score of 3.71 and is ranked 2nd.

Well as security facilities clean market environment is lacking as water supply, good toilets which contribute to efficient grain marketing are lacking. These items all received a mean score of 3.7 ranked 3rd and are remarked significant.

Test of hypothesis.

There is no significant relationship between market infrastructures and marketing of grains in the states of the North of Nigeria, to test this hypothesis, the table above was used.

Regression Statistics for Hypothesis

Model	Variable Enter	Variables Removed	Method
1	Market Infrastructure		Enter

Model	R	R - square	Adjusted R- Square	Std. Error of Estimates
M	.971	.942	0.942	0.51229

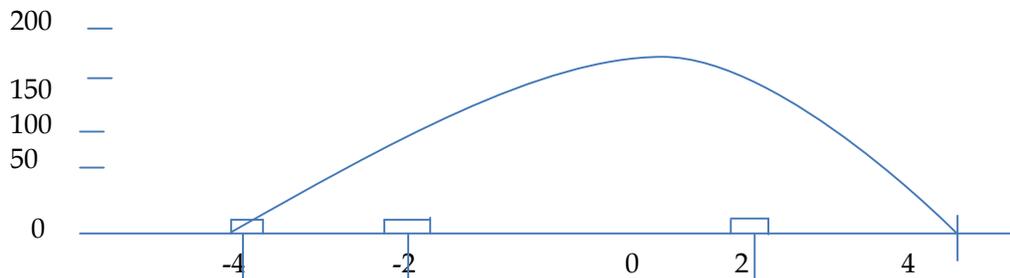
Model Summary.

- Predictors (Constant), Market infrastructure
- Dependent variable: marketing of grain

Charts

Histogram.

Dependent variable: marketing of grains



Analysis in the table above shows that regression analysis is significant at 0.05 level of significance ($f=4872.640$, $\beta=0.991$, $t = 69.804$, $P = 0.0000 < \alpha = 0.05$).

Decision role at significant level of 0.05 or 5% confidence limit.

- i. Accept the null hypothesis (H_0) if the calculated P- value is greater than the adopted level of significance ($\alpha=0.05$), which indicate that the relationship is insignificant.
- ii. Reject the null hypotheses (H_0) is calculated P - value is less than the adopted level of significance ($\alpha=0.05$), which indicate that the relationship is significant.

Based on the above results, the null hypothesis is rejected and the alternate hypothesis accepted.

From the results above, it is obvious that the alternate hypothesis which says, there is a significant relationship between market infrastructure and marketing of grains in selected states of the north of Nigeria is accepted. The coefficient of determination $r^2= 0.942$, we see that 94.2% of the variability in grains marketing can be explained by the effect of market infrastructure.

This study seeks to know if there is a significant relationship between market infrastructure and marketing of grains in selected states of the North of Nigeria. The regression result in this analysis is as follows:

$\beta= .991$, $r^2 = 0.942$, $t = 69.804$, $P = 0.000 < \alpha =0.05$. This results suggest that a strong relationship exist between market infrastructure and marketing of grains in selected states of the North of Nigeria.

In marketing of grains in the states of the North of Nigeria, certain uncertainties are encountered. These uncertainties in grains marketing include, poor storage, damages, poor quality, problems of grains storage is common particularly with Sokoto, Taraba, activity which enhances marketing efficiency by providing utility. Storage is particularly important in agriculture because agricultural production is seasonal while demand for agricultural commodities are more evenly spread throughout the year. In this circumstance, there is need to meet average demand by storing excess supply during the harvesting season for gradual release to the market during off-season periods. In this process, seasonal prices are stabilized. Post-harvest facilities or for a long time. This has resulted in considerable loss to the economy. According to Clough (1985), Nigeria is losing about 2.4 billion tonnes of food yearly to poor harvest and storage facilities. The losses are mainly in maize, rice, sorghum, millet, cowpea, and soyabeans and so on. In monetary terms, Nigeria is losing more than a total of N48 billion annually on post-harvest losses. It has been observed that different localities in states of the North have peculiar storage methods depending on the types of crops grown (Adebide, Adeyumo and Raji, 2007). In Nigeria and particularly the north, the average proportion of food production retained by framers for their ovum consumption is usually assumed to be 70% (Adejumo and Raji, 2007). However, there is a high degree of variation reflecting among other factors, the size of holding, the interaction of consumer's pattern with cropping patterns, level of indebttness, and the form of labour payment. In the north, grains kept in farmers structures are mainly for household consumption, any surplus grain to consumption requirements may be sold within two or three months of harvest. After harvest, grains may be stored temporarily in bulk or bags for a month or two before being transferred to a structure. The traditional grain storage structures in different states of the North of Nigeria are made of varying locally available materials.

Usually, the type of locally available materials indicates the type of structures. The structures are made of paddy straw, split or whole bamboo poles, planks, reeds, robes, mud brick and so on. Most structures are constructed at the beginning of the harvesting season. Grains are stored either in threshed or unthreshed forms.

Conclusion

This paper examined the effect of market infrastructure on marketing of grains in selected states of the North of Nigeria. In most Northern states of Nigeria where grains are produced in large quantities storage facilities are lacking. Where they exist, they are grossly inadequate. Evidence from the study revealed that local storage facilities are used to store grains resulting into huge post-harvest losses. Market infrastructure like telecommunication facilities, hospitals are completely lacking.

Recommendation.

On the basis of the findings of this study, the following recommendations are made.

1. There is need to construct more grain silos in major grain producing states in the country.
2. Farmers should be assisted to construct good storage barns either on their farm or their house for storage of grains.
3. There is need to improve on the general grain storage system in Nigeria if attainment of objects is to be achieved.

References

- Abdullah, D.C (2005), Improving maize marketing and trade policies to promote Household food Security in Southern Mozambique. An unpublished Master of Science thesis, Department of Agriculture Economics.
- Adejamum, B.A and Raji A.O (2007), Technical Appraisal of grains storage systems in the Nigerian Sudan Savannah Agriculture Engineering international the CICRO Journal NO. 11 Vol. ix
- Ahmed, B. and Rikkoi H. (2005), Market institutions for maize in Northern Nigeria. Investigation on Building a food marketing policy Evidence Base in Nigeria. November 2005.
- Faajir, A. and Nnabuko, J.O. (2013), Strategies for Improving the use of Research as a Panacea for effective marketing of grains in Nigeria. Mkar Journal of Media and Culture VOL. 1 No.1 pp.180.
- Faajir, A. (2014), Effects of Research on Marketing of grains in selected states of northern Nigeria. Unpublished PhD Thesis.
- Global Trade (undated), Rice in Nigeria. Available at www.globaltrade.net/f/market-research/pdf/nigeria...grains-and-feeds-annual-in-nigeria.html. accessed on 23rd May 2012.
- Nuhu, H.S, Ani, A.O, and Bawa, D.B (2009), Food grain marketing in North east Nigeria ; a study of spatial and Temporal price efficacy. Am .eurasian journal of sustain agriculture. 3(3),473-480,2009.