

**SHARP PRACTICES OF STORING GRAINS AMONG MARKETERS IN  
EGOR LOCAL GOVERNMENT AREA, EDO STATE, NIGERIA.**

**BY**

**Helen BLOWE (Miss)  
AGR1700014**

**DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION  
SERVICES  
FACULTY OF AGRICULTURE  
UNIVERSITY OF BENIN  
BENIN CITY.**

**OCTOBER,2023.**

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**A PROJECT SUBMITTED TO THE DEPARTMENT OF  
AGRICULTURAL ECONOMICS AND EXTENSION, FACULTY OF  
AGRICULTURE, UNIVERSITY OF BENIN, BENIN CITY  
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE  
AWARD OF THE DEGREE OF BACHELOR OF AGRICULTURE**

**OCTOBER, 2023**

## CERTIFICATION

This is to certify that Helen BIOWE, with the matriculation number AGR1700014 carried out this research work in partial fulfillment for the degree of Bachelor of Agricultural Economics and extension services, Faculty of Agriculture, University of Benin, Benin city, Nigeria.

\_\_\_\_\_  
**Mrs. S. E. OKUNDAYE**  
Project supervisor

\_\_\_\_\_  
**Dr (Mrs.) M. J. KOYENIKAN**  
Head of Department

DATE: \_\_\_\_\_

DATE: \_\_\_\_\_

## **DEDICATION**

This project work to my parents Mr. Sunny Biowe and Mrs. Angela Biowe for their show of love, their support and not giving up on me throughout the course of study.

## ACKNOWLEDGMENTS

My sincere gratitude goes to my project supervisor Mrs. S. E. Okundaye for her immense and inestimable contributions and her advice throughout the time of this research.

I also wish to appreciate the dean of the faculty of Agriculture, Prof. E. R. Orhue for being a father to this great faculty of Agriculture. To my Head of Department, Prof (Mrs) M. J. Koyenikan, ; lecturers of Agricultural economics and extension services: Dr. Mrs. O. B. Izekor, Prof. D. U. Okoedo-Okojie, Prof. J. Ahmadu, Prof. K. O. Ilavbarhe, Dr. O. Ojogho, Dr. (Mrs.) C. O. Egonmwan and the entire staff of the department of Agricultural Economics and Extension Services, thank you all for the advice and contributions.

I also appreciate my course adviser; Mrs. A. I Kenneth, for being more than a course adviser but also a mother, for all the advice, support and corrections.

My appreciation goes to my parents, Mr. and Mrs. Biowe for their financial and emotional support all through, this would not have been possible without you. I also want to acknowledge my siblings; Faith, Preye, Ebiye, Favour and Ebipade Biowe for their support and also friends that became family: Naomi and Hauwa Sagay and Ruth Aluyor for their advice and for standing by me all through. I love you immensely.

I will like to also thank my friends: Mary precious, Rita and Beatrice (Last girls standing) Ebube, Toni, Sandra, Akpo and Osaze. Thank you all for your assistance and the entire 500 level students of the department of Agricultural economics and extension services

who has positively influenced my ideas to a successful career in school, may the almighty God bless you all inevitably in all your endeavors. Amen.

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## ABSTRACT

The study analyzed sharp practices used in storing grains by grain marketers in Egor Local Government Area of Edo state, Nigeria. A total of 74 grain marketers were sampled in the study area. Copies of structured questionnaire were used in collecting data for the study. The data collected were analyzed by means of descriptive statistics such as frequency distribution, percentage, mean and standard deviation and logistic regression was used to test the hypothesis.

The major findings were that some (33.8%) of grain marketers were between the age 31-40 years and the computed mean age of the respondents was 41. Also almost equal proportion of both sexes were involved in marketing of grain (male - 51.4%, female - 48.6%). The results also showed that higher percentage of the respondents (55.4%) dealt with maize and most (37.8%) of the respondents acquired secondary school education as their highest form of education, 68.9% had their source of information on how to store grains from their family. Results also show that majorities (> 50%) of respondents were aware of each sharp practice mentioned.

It is recommended that marketers should get involved in value addition. Also, there is a need for marketers to organize themselves into cooperative groups which could help in lobbying for construction of new roads or repair of existing roads and easy access to information.

## **CHAPTER ONE**

### **1.0 INTRODUCTION**

#### **1.1 Background of study**

The history of grain dates back to the Neolithic Revolution, about 10,000 years ago, when prehistoric communities started to make the transition from hunter-gatherer to farmer. The first grains to be domesticated were einkorn and emmer, which are ancestors of today's wheat. These grains grew wild near the banks of rivers in the Fertile Crescent, a region of the Middle East that is considered to be the birthplace of agriculture. Over time, farmers began to selectively breed wild grains to produce larger and more productive varieties. They also developed new techniques for cultivating and harvesting grains, which allowed them to produce more food than they needed for their own immediate consumption. This surplus food led to the rise of permanent settlements and the development of more complex societies.(James C. Scott, 2017). Grains played a vital role in the development of many ancient civilizations, including the Egyptians, Babylonians, Greeks, and Romans. Grains were used to make bread, beer, and other staple foods. They were also used as a form of currency and as a way to pay taxes. The cultivation of grains spread to new parts of the world over time. Rice was domesticated in Southeast Asia around 7,000 years ago, and maize was domesticated in Central America around 9,000 years ago. These grains became

staple foods in their respective regions, and they continue to be important sources of food for people around the world today. The Green Revolution, which began in the 1940s, led to a significant increase in grain production. This was due to the development of new high-yield varieties of grains, the use of synthetic fertilizers and pesticides, and improved irrigation techniques. The Green Revolution helped to alleviate hunger in many parts of the world, but it also had some negative environmental impacts, such as water pollution and soil degradation. Today, grains are the most important food crop in the world. They provide more calories and protein than any other type of food. The most widely grown grains are wheat, rice, maize, and barley. Grains are used to make a wide variety of foods, including bread, pasta, cereal, beer, and whiskey. Grains are an essential part of the human diet. They are a good source of carbohydrates, fiber, and protein. Grains are also affordable and easy to store, which makes them a valuable food source for people all over the world (James C. Scott, 2017).

The history of grain in Nigeria can be traced back to the ancient times. Grains were grown and consumed by the early inhabitants of the region, and they played a significant role in the development of Nigerian agriculture and culture. (Ogbonna C. N, 2011). One of the earliest grains to be cultivated in Nigeria was millet. Millet is a drought-resistant cereal grain that is well-suited to the Nigerian climate. It was introduced to Nigeria by early agricultural communities migrating

from the Sahara around 4000 BCE. Millet cultivation thrived in Nigeria, and it became a staple of the Nigerian diet. Other grains that were cultivated in Nigeria during the pre-colonial era include sorghum, maize, and rice. Sorghum is another drought-resistant cereal grain that is well-suited to the Nigerian climate. It was introduced to Nigeria around 2000 BCE, and it quickly became a staple of the Nigerian diet. Maize was introduced to Nigeria by Portuguese traders in the 15th century. It quickly became a popular crop, and it is now one of the most important staple foods in Nigeria. Rice was also introduced to Nigeria by Portuguese traders in the 15th century. It was initially grown in the southern coastal regions of Nigeria, but it has since spread to other parts of the country. (Olojede A. O, 2015). Grains played a significant role in the development of Nigerian agriculture and culture during the pre-colonial era. They were a major source of food, and they were also used in trade and religious ceremonies. During the colonial era, the British colonial government introduced new agricultural policies that promoted the cultivation of cash crops such as cocoa, rubber, and palm oil. This led to a decline in the cultivation of grains. However, grains remained an important part of the Nigerian diet, and they continued to be grown by subsistence farmers. After Nigeria gained independence in 1960, the government made efforts to promote the cultivation of grains in order to reduce the country's reliance on imported food. The government introduced new agricultural policies and provided subsidies to farmers. This led to an increase in the production of grains in Nigeria. Today,

grains are a major part of the Nigerian diet. The most popular grains in Nigeria are maize, sorghum, millet, and rice. Grains are used to prepare a variety of Nigerian dishes, including porridge, bread, and stews. Nigeria is the largest producer of grains in West Africa. However, the country still imports some grains, such as wheat. The Nigerian government is working to increase domestic production of grains in order to reduce the country's reliance on imports. (Olatunji, O. 2019).

Sharp practices refer to unethical or illegal activities carried out by individuals or organizations. Common examples in Agriculture includes adulteration of maize - adding or mixing maize with sand and stone to make the bag heavier before sale-, combination of maize with bad or spoilt maize, lack of hygiene and sanitation in storage area, use of harmful chemicals etc. Sharp practices are age long phenomena that have been known to pose serious impediments to sustainable developmental efforts in many developing and developed countries of the world. These could be in the areas of agriculture, education, economy, politics as well as in social spheres of human existence.(Godson et Al, 2016).

## **1.2 Statement of Problem**

Despite the significance of grain cultivation and storage for food security and economic development in Egor Local Government Area, Edo state, there is a prevalence of sharp practices in grain storage. This has resulted in post-harvest

losses, reduced income for farmers, health hazards for consumers, and environmental degradation. Thus, there is a need to investigate the root causes, impacts, and potential solutions to address the sharp practices in grain storage in Edo state. The study therefore intends to provide answers to the following questions:

1. What are the socio-economic characteristics of the respondents of the study area?
2. What are the sharp practices respondent are aware of in the study area?
3. What are the sharp practices in use and how often are they used?
4. What are the constraints faced by marketers in storing grain in the study area?

### **1.3 Aims and Objective**

The aim of this research is to identify sharp practices used in storing grain in Egor Local Government Area, Edo state, Nigeria. In order to achieve the general objective, the following specific objective will be evaluated.

1. to describe the socio economic characteristics of the respondents in the study area;

2. to identify the respondents awareness to sharp practices in grain storage in the study area;
3. to identify the sharp practice in use and level of usage by respondents in the study area and;
4. to identify constraints experienced by farmers in storing grains.

#### **1.4 Hypothesis**

**Ho1:** There is no significant relationship between socio-economic characteristics and the effect of the storage practice.

#### **1.5 Justification of study**

To be sustainable, agriculture must meet the needs of present and future generations, while ensuring profitability, environmental health, and social and economic equity (Sustainable food and Agriculture, 2020). Safe storage can also help farmers to access credit: farmers can pool their produce, store it and then sell as a group enabling them to market good quality and large volumes. (Cephaset *al.*, 2014). Grains are major source of energy and protein in the human diet. Therefore, grains need to be stored well to preserve it against thieves, pests and diseases. Storage may, therefore, lead to quantity equalisation and market stabilisation. (Anthony *et al.*, 2022)

The study on sharp practices of storing grain in Egor Local Government Area, Edo state has the potential to enhance food security, promote sustainable agriculture, improve farmers' livelihoods, and contribute to a healthier and more environmentally friendly food system.

## CHAPTER TWO

### 2.0 LITERATURE REVIEW

#### 2.1 Conceptual Framework

Grains and grain-based products are critically important for world food security. They are main staple foods in practically every country and constitute essential sources of calories for large parts of the population, especially the poor (Schmidhuber, Josef and Qiao, 2020). One characteristic that makes grains particularly important from a food security perspective, both at national and household level, is their storability, which is higher and less costly compared to many other food products such as meat and dairy as well as most fruits and vegetables (Springer et al., 2011). Especially in developing countries, many households keep grain reserves to make it through the lean period between harvests while a large number of governments hold grain stocks to safeguard national food security in case of an emergency. Global grain production has been increasing every year, which highlights the need for investment in components of postharvest system. Product prices and options for raw material holders fluctuate over the years, as a result of public policies, government stocks, and trade barriers. In order to allow commercialization after harvest, the grains need to be stored, and their quality needs to be preserved throughout this period. However, with the increase in production levels, there is increasingly a deficit in static storage

capacity, which increasing cost and end losses along the marketing chain. The Food and Agriculture Organization of the United Nations (FAO) recommends that a country must have a static storage capacity greater than its production capacity, which guarantees a nation's food security (FAO, 2019). The storage deficit generally leads to qualitative and quantitative losses (CONAB, 2020; FAO, 2019). Allied to these factors, some of the units currently used have a deficient storage structure, and characteristics that hinder correct storage.

## **2.2 Grain storage**

When storing grains, it is necessary to conserve them, and this requires care, knowledge, dedication, and professionalism from the individuals involved in the process. The ability to preserve the quality, health, and nutritional value of the grains during the storage period, does not depend only on the conditions of production and harvest, but also on storage, and maintenance of appropriate conditions for storage (Mobolade et al., 2019). Grains are susceptible to damage from a variety of sources, including pests, diseases, and environmental factors. This damage can lead to quantitative and/or qualitative losses, making the grains less nutritious, toxic, or less valuable. As a result, it is important to use adequate techniques and conservation methods to protect grains from damage. (Mobolade et al., 2019; Mohapatra et al., 2017; Neme and Mohammed, 2017). Grains must be in good condition before storage to minimize quantitative and qualitative

losses. Quantitative losses are caused by the metabolism of grains and associated organisms, while qualitative losses are caused by chemical and enzymatic reactions, as well as the presence of foreign matter, impurities, and microbes. Qualitative losses can reduce the nutritional value, germination rate, commercial value, and safety of grains. Proper storage procedures are essential to prevent losses. (Paraginski et al., 2014; Fleurat-Lessard, 2017; Demito et al., 2019). Storage systems are grouped according to practical application, into non-hermetic (conventional), semi-hermetic or bulk (horizontal silos, vertical silos and warehouses), hermetic, refrigerated, and modified atmosphere storage.

### **2.2.1 Conventional system**

The non-hermetic system, also known as the conventional system, is the most diversified storage system, ranging from rustic units, such as storerooms, and barns, to larger and more technicalized units, such as conventional warehouses. These systems generally use sacks made with different materials and of different sizes for storage. The use of larger packages that store up to 1000 kg of grains, has been increasing in places with higher production, and they are easily transported with the aid of mechanical equipment developed by agricultural companies (Mobolade et al., 2019). The conventional storage system allows the storage of several grains in the same warehouse, and higher quality grains can be separated from lower quality grains during the storage, a facility that bulk storage

systems do not allow. However, for the grains to be stored in this system, moisture needs to be reduced to levels below the moisture traditionally indicated for storage, due to the greater area of possible water and thermal exchanges with the environment during storage.

### **2.2.2 Semi-hermetic or bulk system**

The semi-hermetic storage system, also called the bulk system, is a widely used system of grain storage, being characterized as a system that allows gas exchange between the interior of the grain mass and the environment. However, these exchanges are smaller when compared to non-hermetic systems, and larger when compared to hermetic systems (Coradi et al., 2020). Bulk storage does not allow for individualization of cargo or direct inspection, making sample collection difficult. Maintenance or quality control measures, such as temperature control, are carried out indirectly, such as by thermometry. Cable systems with thermocouples, made of constantan and copper alloy, predominate in thermometry.

### **2.2.3. Hermetic system**

The hermetic system, does not apply for large volumes. Casks, drums, and other containers, for small quantities, and “plastic silos” for slightly larger quantities predominate in this system, while in emergencies, the most used models are “the

sack pools.” However, in recent years, emergency warehouses have become a storage alternative for producers. These hermetic storage systems for dry or wet grains are based on the principle of reducing the oxygen available in the storage ecosystem to lethal or limiting levels for the associated living organisms. This reduction can be achieved spontaneously through the respiratory process of the existing grains and organisms, by exhaustion of air, and by burning candles, cotton and other materials inside the container, which reduces the level of oxygen (O<sub>2</sub>) and increases the level of carbon dioxide (CO<sub>2</sub>). CO<sub>2</sub> is one of the final products of metabolism of organic substrates in living organisms, and has a conservative effect in hermetic conditions, with inhibitory action on the enzymatic activity of the grains and associated organisms, thereby causing death of the microorganisms (Govereh et al., 2019; Odjo et al., 2020). Hermetic grain storage conditions act selectively on insect populations by decreasing their activity, inhibiting and/or biological paralysis (Odjo et al., 2020).

Grain storage systems are essential for obtaining good quality grains which are safe for consumption. Therefore, correct management of grains with simple practices must always be adopted, to help in the maintenance of the characteristics of the grains for long periods. These practices seek to improve the current condition of the field the postharvest. Several systems are available for storage and these are affected by the grain moisture, temperature, and storage time for

each species. Specific studies of each of these factors need to be considered for decision making, as they will assist in the reduction of qualitative and quantitative losses of grains.

## **2.3 Sharp Practices in Grain Storage**

In the context of Nigeria's agricultural landscape, the storage of grains has long been a critical aspect of the supply chain. Efficient grain storage is essential for maintaining food security, reducing post-harvest losses, and ensuring fair pricing for both producers and consumers. However, recent studies have highlighted the prevalence of sharp practices in grain storage among marketers in Nigeria, raising concerns about its implications on food quality, safety, and economic fairness. One of the primary reasons for investigating sharp practices in grain storage is the significant post-harvest losses experienced by Nigeria's agricultural sector. According to Onwuka, Nkwocha, and Ogbonnaya (2019), these losses result in reduced income for farmers and increased food insecurity in the country. Sharp practices such as adulteration, underfilling, and substandard storage conditions exacerbate these losses, as reported by Aliyu and Mohammed (2020).

### **2.3.1 Various Forms of Sharp Practices**

Previous studies have identified several forms of sharp practices in grain storage prevalent among marketers in Nigeria:

- a. Adulteration: Adulteration involves mixing inferior or lower-quality grains with high-quality grains to increase the volume without regard for the nutritional value or safety of the final product (Olayemi & Ogundipe, 2018).
- b. Underfilling: Underfilling is the practice of intentionally providing less quantity of grains than what is paid for, often by manipulating weighing scales or using containers with deceptive measurements (Aliyu & Mohammed, 2020).
- c. Substandard Storage Conditions: Many marketers store grains in substandard conditions, such as damp and poorly ventilated warehouses, leading to spoilage, mold growth, and contamination (Adebayo et al., 2018).
- d. Overextended Storage: Some marketers keep grains in storage for extended periods, often beyond their shelf life, and then sell them, risking the health of consumers (Okoye et al., 2017).
- e. Use of harmful chemicals : Some marketers use certain chemicals which are harmful to the human body for grain storage (eg Sniper). The use of chemicals may have side effects, which could cause illness in humans and animals.
- f. Falsify or no storage record

### **2.3.3 Economic Impact of Sharp Practices in Grain Storage**

The economic consequences of sharp practices in grain storage are a major concern. Olayemi and Ogundipe (2018) argue that dishonest practices lead to unfair pricing of grains, affecting both producers and consumers. Farmers often receive lower prices for their produce due to adulteration and underweighing, while consumers may unknowingly purchase substandard products, as discussed by Okoye et al. (2017).

### **Impact on Farmers**

Farmers in Nigeria, particularly smallholders, bear a substantial brunt of these sharp practices. Adulteration and underweighing result in reduced income for farmers, as they are paid less for their produce (Olayemi & Ogundipe, 2018). This diminished income negatively impacts their ability to invest in agricultural practices, leading to reduced crop yields and overall economic productivity.

### **Impact on Consumers**

Consumers are not spared from the economic implications of sharp practices. Substandard storage conditions can lead to contamination, mold growth, and aflatoxin contamination (Adebayo, Adebowale, & Sobukola, 2018). As a result, consumers may unknowingly purchase grains of lower nutritional value and safety. Health issues arising from contaminated grains can lead to increased healthcare costs, further straining the economy.

### **Impact on Food Security**

Nigeria's food security is intricately linked to grain storage practices. Post-harvest losses due to sharp practices contribute to food scarcity and higher prices. With Nigeria's population projected to grow significantly in the coming decades, ensuring food security is paramount. Reducing post-harvest losses through ethical grain storage practices is essential to achieving this goal (Onwuka, Nkwocha, & Ogbonnaya, 2019).

### **Impact on Market Reputation**

Sharp practices in grain storage tarnish Nigeria's reputation in the global food market. Substandard grains and unethical practices can result in trade restrictions and loss of export opportunities. This affects the country's foreign exchange earnings, balance of trade, and overall economic stability (Osabuohien & Efobi, 2019).

## **2.4 Theoretical frame work**

The storage of grains is a fundamental component of Nigeria's agricultural sector, influencing food security, economic stability, and the welfare of farmers and consumers. However, the prevalence of sharp practices in grain storage among marketers poses significant challenges. To comprehensively assess the impact of

these practices, this section integrates a theoretical framework drawing upon Political Economy Theory, Institutional Theory, and Stakeholder Theory.

### **Political Economy Theory**

Concept: Political economy theory provides insights into the intricate relationship between politics, economics, and institutions within a society (North, 1990). In the context of grain storage, this theory offers a lens through which we can understand the political dynamics and economic interests that influence the behavior of grain marketers.

Application: Applied to the analysis of sharp practices in grain storage in Nigeria, political economy theory allows us to explore how political decisions, economic interests, and vested stakeholders shape the regulatory environment and enforcement mechanisms surrounding grain storage. It underscores the influence of political elites and powerful actors who may manipulate policies for their benefit (Olson, 1965).

### **Institutional Theory**

Concept: Institutional theory emphasizes the role of formal and informal rules, norms, and structures in shaping human behavior within organizations and society (Scott, 1995). In the context of grain storage, this theory helps elucidate the impact of institutions on facilitating or constraining sharp practices.

Application: When applied to the analysis of grain storage practices, institutional theory enables a nuanced examination of how formal institutions (e.g., regulatory agencies, industry associations) and informal norms influence the behavior of grain marketers. It is particularly valuable in understanding how the presence of corrupt or ineffective institutions contributes to unethical storage practices (DiMaggio & Powell, 1983).

### **Stakeholder Theory**

Concept: Stakeholder theory emphasizes the significance of identifying and considering the interests of all stakeholders involved in a particular issue (Freeman, 1984). In the context of grain storage, this theory allows for the exploration of the diverse stakeholders and their interests in the grain storage supply chain.

Application: Applied to the analysis of sharp practices in grain storage, stakeholder theory enables us to identify and assess the interests of key stakeholders, including farmers, consumers, marketers, regulatory bodies, and policymakers. Understanding these interests is pivotal in comprehending the impact of sharp practices on different stakeholders.

## **CHAPTER THREE**

### **3.0 METHODOLOGY**

#### **3.1 Study area and scope of study**

Edo State which is an agricultural state has a total land area of 19,599km<sup>2</sup> (Nigeria Exchange, 2006) and an estimated population of about 3.2 million people (National Population Census, 2006), the estimated population for 2023 is about 4.7 million, Agriculture is the mainstay of the economy. Yams, cassava (manioc), oil palm produce, rice, and corn (maize) are the major subsistence crops while rubber, timber, and palm oil and kernels are cash crops. Edo state is made up of several settlements most of which are rural. Edo state lies at elevations between 500 feet(150m) in the south and more than 1800 feet's(550m) in the north. Tropical rainforest covers most of the area.

Edo State is one of the 36 states of Nigeria located in the Southern region of the country. It's capital is in Benin City. It was created on the 27th of August, 1991 out of the former Bendel state. Edo State lies between longitude 6° 04'E and 6° 43'E and latitude 5° 44'N and 7° 34'N of the equator. It is bounded by Delta State in the south, Ondo State in the west, Kogi state in the north and Anambra State in the east.

There are 18 local government areas in Edo state, namely; Akoko-Edo, Egor, Esan Central, Esan North-East, Esan South-East, Esan West, Etsako Central, Etsako East, Etsako West, Igueben, Ikpoba-Okha, Oredo, Orhionmwon, Ovia North-East, Ovia South-West, Owan East, Owan West and Uhumwonde.

Egor is a local government area in Edo state, Nigeria. Its headquarters are in the town of Uselu. Egor local government area falls under the Tropical Savannah Climate. The area experiences two major seasons which are the rainy and the dry seasons while the average temperature of the area is at 28 °C. (Nigerian Finder, 2023). It has an area of 93 km<sup>2</sup> and a population of 339,899 as at the 2006 census. A number of towns make up this local government area and they include; Okhoro, Use, Uwelu, Iguikpe, Ugbighoko, Iguediaye, Evbougide, and Oghedaivbiobaa. This area hosts members of several tribal groups such as Esan, Bini and the Owan.(Egor LGA, 2021). The area is home to Christians, Muslims and traditional worshippers.

### **3.2 Sample Procedure and Sample size**

A two-staged sampling procedure was carried out in selecting the respondents.

1st stage: Simple random selection of 5markets in communities in Egor Local Government Area.

2nd stage: Simple random selection of respondents, making a total of 100 respondents.

### **3.3 Sources of Data**

In this study, primary data was obtained from personal interviews and the use of structured questionnaire designed in line with the objective of the study. The secondary data was obtained from relevant literature, FAO studies, World bank, Agricultural Journals, text, bulletin, and the internet.

### **3.4 Measurement of variable**

#### **3.4.1: Socio-economic characteristics**

The Respondents were asked to indicate the following:

1. Sex: Respondents were asked to indicate their sex; Female 1, Male 2
2. Age: Respondents were asked to indicate their date of birth in years.
3. Type of Grain: Respondents were asked to indicate the type of grain stored.
4. Level of Education: This was measured using nominal measurement scales. The respondents were asked to indicate their current educational qualification by indicating if they have: Primary education scored 1,

secondary education scored 2, and tertiary education scored 3, formal education scored 4.

5. Years in the grain business: Respondents were asked to indicate how long they have been working with maize.
6. Religion: Respondents were asked to indicate their religion. This was measured nominally as follows: Christian scored 1, Muslim scored 2, Traditional worshipper scored 3 and others scored 4.
7. Marital status: Respondents were asked to indicate their marital status. This was measured nominally as follows: Single scored 1, Married scored 2, Divorced scored 3, Widowed scored 4 and Separated scored 5.
8. Annual income from grain sales: in Naira
9. Source of information: Respondents were asked to indicate their source of information about maize storage, by indicating if they got it from 1 Radio, 2 Research institute, 3 Family, 4 Grain sellers association

### **3.4.2: Various sharp practices**

Respondents were asked to identify sharp practices from list provided below;

1. Use of chemicals; Yes 1, No 2.
2. Mixing contaminated and good grain; Yes 1, No 2.

3. Absence of pest control measures; Yes 1, No 2.
4. Contamination of grains (with sand and stone); Yes 1, No 2.
5. Improper hygiene and sanitation; Yes 1, No 2.
6. Use of damaged storage facility; Yes 1, No 2.
7. Hoarding maize to create artificial scarcity; Yes 1, No 2.
8. Falsify storage records; Yes 1, No 2.
9. No storage record; Yes 1, No 2..

#### **3.4.3: Level of usage**

Respondents were asked to indicate the level of use for each sharp practice mentioned above using a 5 likert scale; Very often 1, Often 2, Undecided 3, Not often 4, Not very often 5.

#### **3.4.4: Constraints**

This was achieved using a 5 point Likert scale scored Very Serious (1), Serious (2), Undecided (3), Moderately serious (4), Not serious (5). A mean score of 3.0 and above was taken to mean that the respondents faces challenges in storing maize.

### **3.5 Data Analysis**

## **Analytical techniques**

Objective 1: to describe the socio economic characteristics of the respondents.

This was achieved using descriptive statistics such as frequency counts and percentage.

Objective 2: to identify the respondents awareness to sharp practices in grain storage in the study area. This was achieved using frequency analysis.

Objective 3: to identify the sharp practice in use and level of usage by the respondents in the study area. This was analyzed using mean score, frequency analysis and standard deviation.

Objective 4: to identify constraints faced by marketers in storing grain. This was achieved using mean scores.

## **3.6 Test of hypothesis**

Hypothesis 1: There is no significant relationship between socio-economic characteristics and the effects of storage methods. This was tested using logit regression as shown below:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 \dots\dots\dots b_nX_n + U$$

$b_0, b_1, b_2, b_3, \dots, b_5$  = regression coefficient

Y = Effectiveness of storage methods

$b_0$  = The intercept representing the expected value of Y when X is zero

$X_1$  = Sex(male or female)

$X_2$  = Age(Number in years)

$X_3$  = Level of Education(Primary, Secondary, Tertiary, non formal education)

$X_4$  =Years in maize business

$X_5$ = Source of Information (Radio, Research institute, Family, fellow maize farmers)

U =Error term

## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION**

This chapter presents the results of data analysis, discussion of findings in line with the objectives and hypothesis of the study. A sample of 100 grain marketers were interviewed but 74 copies of the questionnaire administered were found analyzable. Thus, a total of 74 became the sample size.

#### **4.1 SOCIO-ECONOMIC CHARACTERISTICS**

##### **Sex of respondents**

Evidence in table 1 showed that 51.4% and 48.6% were male and female respectively. This showed that both male and female in the study area were involved in the marketing of grains in the study area. It is observed that almost equal proportion of both sexes participated in the marketing of grains. The implication of this finding is that grain marketing may not have any gender barrier in the study area. This is not usually the same in many areas but more research can be made in this context as stated by Olayinka et al, 2019.

##### **Age of respondents**

Result in Table 1 showed that 33.8% of the respondents were between 31-40 years of age, 28.4% of the respondents were between 41-50 years, 30.3% of the respondents were above 51 and 17.6% of the respondents were below 30 years of

age. The largest proportion of grain marketers were between the ages of 31 and 40, which is a time when people are typically in good physical condition and have the energy to perform physically demanding tasks, this is in line with the Agricultural age stated by Ritchie .M. 2019).

### **Type of grain**

The results in Table 1 showed that maize is the most popular grain sold by respondents, with 55.4% of the respondents selling it. Rice is the second most popular grain, with 17.6% of the respondents selling it. Sorghum, millet, and wheat are all less popular, with percentages of respondents selling them ranging from 4.1% to 9.5%. It is worth noting that 6.8% of the respondents sell more than one grain. This suggests that some respondents may specialize in selling multiple grains, while others may sell grains in addition to other products. Overall, the results in Table 1 suggest that maize and rice are the most popular grains sold by respondents in this survey (Nigeria Economic Update, 2023). Sorghum, millet, and wheat are all less popular, but still sold by a significant percentage of respondents.

### **Education**

Result in Table 1 showed that 37.8% of the respondents had secondary school education 13.5% of the respondents has non formal education, 21.6% of the

respondents acquired primary school education, while 27% of the respondents had tertiary school education. The finding showed that higher percentage of the respondents were found having secondary school education which is against Ogunmefun, 2015 findings which showed that higher percentage had primary education. Respondents having secondary school education may have developed interest in farming through their experiences about agriculture in school and this make them go into farming and other agricultural related practices

### **Years in grain business**

The experience distribution of respondents in Table 1 showed that a 47.3% have less than 5 years of experience. This is followed by 29.7% of the respondents with 6-15 years of experience, 12.3% of the respondents were with 16-25 years of experience, and 10.8% of the respondents were with more than 26 years of experience. This distribution suggests that the field is relatively young, with a large proportion of new entrants. This could be due to a number of factors, such as the increasing demand for certain skills and expertise, the creation of new jobs, or the expansion of existing industries. The fact that there is a significant number of respondents with less than 5 years of experience (47.3%) suggests that there are also opportunities for career growth and development in the field. Additionally, the experience of these respondents can be valuable to the field as a whole, as they can provide mentorship and guidance to newer entrants. Overall, the

experience distribution of respondents in Table 1 suggests that the field is dynamic and growing, with opportunities for people of all experience levels.

### **Religion**

The results of table 1 showed that higher percentage of respondents were Christians with 59.5%, followed by Muslims at 27%, traditional worshippers at 4.1%, and undisclosed at 9.5%. This reflects the religious diversity of the Nigerian population, with Christianity and Islam being the two largest religions. There are a number of possible reasons for the high percentage of Christians in the sample. One possibility is that the sample was drawn from a region of Nigeria where Christianity is the majority religion (Okoewo et al, 2022). Another possibility is that Christians are more likely to participate in surveys and research studies than other religious groups.

### **Marital status**

Results in table 1 showed that 59.5% of the respondents were married, 27% of the respondents were single, 2.7% were divorced, 8.1% were widowed and 2.7% were separated. This findings shows that higher proportion of the respondents were married. This implies that the majority of respondents had a family/spouse to support from the marketing of grains. Another possibility could be that marriage has a cultural value in the area (Paul .O, 2018).

### **Monthly income**

Table 1 shows that 18.9% of respondents earned below 30,000 naira monthly, 77.0% earned between 30,001-50,000, 1.4% earned between 50,001-70,000, and 2.7% earned 70,001 and above monthly. This means that majority of respondents earned between 30,001-50,000 naira monthly. The implications of this findings showed that the business of marketing grains is not a profitable one

### **Source of information**

The source of information in table 1 showed that higher percentage of respondents got their information from their families (68.9%), which is followed by radio and research institutions (10.8%) each and 9.5% of the respondents got their information from Grain marketers association. This suggests that the family has a great influence on the information given to grain marketers in the study area. According to Mosharraf A. R. (et al, 2016), he stated that the family is a preferred source of information when it comes to agriculture.

**Table 1: Socio-economic characteristics**

| <b>Sex</b>            | <b>Freq.,<br/>n = 74</b> | <b>%</b> | <b>Mean</b> | <b>Std.<br/>Dev.</b> |
|-----------------------|--------------------------|----------|-------------|----------------------|
| Male                  | 38                       | 51.4     |             |                      |
| Female                | 36                       | 48.6     |             |                      |
| <b>Age (in years)</b> |                          |          |             |                      |
| <= 30.00              | 13                       | 17.6     |             |                      |
| 31.00 - 40.00         | 25                       | 33.8     |             |                      |
| 41.00 - 50.00         | 21                       | 28.4     | 41.89       | 11.68                |
| 51.00+                | 15                       | 20.3     |             |                      |
| <b>Type of Grain</b>  |                          |          |             |                      |
| Maize                 | 41                       | 55.4     |             |                      |
| Sorghum               | 7                        | 9.5      |             |                      |
| Millet                | 3                        | 4.1      |             |                      |
| Wheat                 | 5                        | 6.8      |             |                      |
| Rice                  | 13                       | 17.6     |             |                      |
| More than one         | 5                        | 6.8      |             |                      |
| <b>Education</b>      |                          |          |             |                      |
| Primary education     | 16                       | 21.6     |             |                      |

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|                                |    |      |      |      |
|--------------------------------|----|------|------|------|
| Secondary education            | 28 | 37.8 |      |      |
| Tertiary education             | 20 | 27   |      |      |
| Non-Formal education           | 10 | 13.5 |      |      |
| <br>                           |    |      |      |      |
| <b>Years in grain business</b> |    |      |      |      |
| <= 5.00                        | 35 | 47.3 |      |      |
| 6.00 - 15.00                   | 22 | 29.7 |      |      |
| 16.00 - 25.00                  | 9  | 12.2 | 8.46 | 6.80 |
| 26.00+                         | 8  | 10.8 |      |      |
| <br>                           |    |      |      |      |
| <b>Religion</b>                |    |      |      |      |
| Christian                      | 44 | 59.5 |      |      |
| Muslim                         | 20 | 27   |      |      |
| Traditional worshipper         | 3  | 4.1  |      |      |
| Undisclosed                    | 7  | 9.5  |      |      |
| <br>                           |    |      |      |      |
| <b>Marital status</b>          |    |      |      |      |
| Single                         | 20 | 27   |      |      |
| Married                        | 44 | 59.5 |      |      |
| Divorced                       | 2  | 2.7  |      |      |
| Widowed                        | 6  | 8.1  |      |      |
| Separated                      | 2  | 2.7  |      |      |

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**Monthly income from grain production**

|                     |    |      |          |          |
|---------------------|----|------|----------|----------|
| <= 30000.00         | 14 | 18.9 |          |          |
| 30001.00 - 50000.00 | 57 | 77.0 |          |          |
| 50001.00 - 70000.00 | 1  | 1.4  | 24444.44 | 13445.11 |
| 70001.00+           | 2  | 2.7  |          |          |

**Source of information (on how to store grains)**

|                              |    |      |
|------------------------------|----|------|
| Radio                        | 8  | 10.8 |
| Research institute           | 8  | 10.8 |
| Family                       | 51 | 68.9 |
| Grains marketers association | 7  | 9.5  |

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**Source:** Field Survey, 2023.

## 4.2 SHARP PRACTICES

The results in table 2 showed the awareness of marketers to various sharp practices in grain storage. 82.4% of respondents were aware of the use of chemicals, 78.4% were aware of no storage record, 74.3% were aware of the use of damaged storage facility, 55.4% were aware of mixing good and bad grains, 41.9% were aware of absence of pest control measures, 60.8% were aware of contamination of grains with sand and stone, 67.6% were aware of improper sanitation, 62.2% were aware of hoarding grains to create artificial scarcity, 31.1% were aware of falsified storage record and . This findings shows that the awareness of sharp practices by respondents are relatively high. Higher percentage of the respondents were aware of the use of chemicals in grain storage, this may be due to the presence of insect (weevil) eating up the grain, followed by no storage record, which can be as a result of absence to pest control measures.

**Table 2: Sharp practices awareness**

| <b>SHARP PRACTICES**</b>                      | <b>Freq., n = 74</b> | <b>%</b> |
|---|----------------------|----------|
| Use of chemicals                              | 61                   | 82.4     |
| Mixing good and bad grain                     | 41                   | 55.4     |
| Absence of pest control measures              | 31                   | 41.9     |
| Contamination of grains(with sand and stone)  | 45                   | 60.8     |
| Improper sanitation                           | 50                   | 67.6     |
| Damaged storage facility                      | 55                   | 74.3     |
| Hoarding grains to create artificial scarcity | 46                   | 62.2     |
| Falsify storage records                       | 23                   | 31.1     |
| No storage record                             | 58                   | 78.4     |

Source: Field Survey, 2023.

\*\* Multiple Responses

### **4.3 USAGE AND LEVEL OF USE OF SHARP PRACTICES**

Results in table 3 showed that 91.9% of the respondents mix good and bad grains with a high usage ( $x=3.17$ ) which could possibly be as a result of combination of factors, including economic pressure, limited storage space, and lack of awareness of proper storage practices. (Nigeria Economy Update, 2023). 87.8% of the respondents falsify storage record with high usage ( $x=3.14$ ), 47.3% of the respondents failed to use pest control measures with a high usage ( $x=3.33$ ) which could be as a result of the cost of controlling pest , another possibility could be the effect of the pest on the grain (if it has minimal damage, no need to use pest control measures). 55.4% of the respondents had improper sanitation with high usage ( $x=3.38$ ) which could be as a result of their low level of income, 44.6% of the respondents had damaged storage facility with high usage ( $x=3.16$ ), which could also be as a result of their low level of income received from marketing grains making it hard to purchase new storage facilities.

**Table 3: Usage of sharp practices**

| <b>Sharp practices</b>                        | <b>Usage</b>            |          | <b>Level of use</b> |                      |
|---|-------------------------|----------|---------------------|----------------------|
|   | <b>Freq.,<br/>n= 74</b> | <b>%</b> | <b>Mean</b>         | <b>Std.<br/>Dev.</b> |
| Use of chemicals                              | 51                      | 68.9     | 2.12                | 1.15                 |
| Mixing good and bad grains                    | 68                      | 91.9     | 3.17*               | 1.09                 |
| Absence of pest control measures              | 35                      | 47.3     | 3.33*               | 0.79                 |
| Contamination of grains (with sand and stone) | 12                      | 16.2     | 3.30*               | 1.06                 |
| Improper sanitation                           | 41                      | 55.4     | 3.38*               | 1.06                 |
| Damaged storage facility                      | 33                      | 44.6     | 3.16*               | 1.15                 |
| Hoarding grains to create artificial scarcity | 69                      | 93.2     | 2.58                | 1.04                 |
| Falsify storage records                       | 65                      | 87.8     | 3.14*               | 0.96                 |
| No storage record                             | 37                      | 50.0     | 2.18                | 1.38                 |

Source: Field survey, 2023.

\* Mean > 3.0= High usage

#### **4.4 CONSTRAINTS**

Results in table 5 showed the constraints faced by grain marketers in storing grains. Unavailability of market (3.85) which could be as a result of imbalance of the Nigerian Economy (Nigeria Economy Update, 2023), poor hygiene (3.78), difficulty in forecasting market demand (3.72), this can also be traced to economic pressure faced by the respondents in terms of inflation, unavailability of storage material (3.68), difficulty in maintaining storage facility due to bad road network (3.50), low demand of grains (3.48), poor storage condition (3.45), impact of access to information (3.42), theft and security concerns (3.41), impact of limited storage capacity due to seasonal demand (3.27), lack of access to insurance to cover for losses due to storage failure (3.21)

**Table 4: Constraints**

| <b>CHALLENGES</b>   | <b>Mean</b> | <b>Std. Dev.</b> |
|---|-------------|------------------|
| Pest infestation  | 2.01        | 1.30             |
| Moisture control problem  | 2.37        | 1.53             |
| Impact of limited access to information                                 | 3.42        | 1.63             |
| How severe is climate and weather risk affecting storage                | 2.96        | 1.56             |
| Theft and security concerns   | 3.41        | 1.50             |
| Impact of limited storage capacity due to seasonal demand               | 3.27        | 1.43             |
| Financial problems  | 2.86        | 1.35             |
| Rodent infestation (eg Rat, bird etc)                                   | 1.67        | 1.00             |
| Poor storage conditions (eg inadequate ventilation)                     | 3.45        | 1.39             |
| Poor hygiene  | 3.78        | 1.53             |
| Unavailability of storage material                                      | 3.68        | 1.38             |
| Unavailability of market  | 3.85        | 1.47             |
| Lack of government support  | 2.59        | 1.57             |
| Lack of access to credit to purchase storage facilities                 | 2.79        | 1.62             |
| Inflation of prices of storage facilities                               | 2.37        | 1.49             |
| Low demand of grains  | 3.48        | 1.43             |
| Difficulty in maintaining storage facility                              | 3.60        | 1.29             |
| Difficulty in forecasting market demand                                 | 3.72        | 1.24             |
| Difficulty in accessing storage facility due to bad road network        | 3.50        | 1.55             |
| Lack of access to insurance to cover for losses due to storage failure. | 3.21        | 1.45             |

Source: Field survey, 2023.

\* Mean > 3.0 = Serious

#### **4.5 HYPOTHESIS TESTING**

There is no significant relationship between socio-economic characteristics and the effects of the storage practice.

Result in Table 6 showed the relationship between selected socio-economics characteristics and the effect of the storage practices. It was observed that source of information ( $p < 0.05$ ) was the significant variable that had an influence on the effect of the storage practice in the study area. The finding showed that there is a relationship between source of information and the effects certain storage practices. This means that the farmers who received information about storage practices from more reliable sources were more likely to use effective storage practices. This is likely because more reliable sources of information, such as agricultural extension agents or research papers, are more likely to provide accurate and up-to-date information on the best storage practices. It was also observed in Table 6 that sex has a p-value of 0.13 which is greater than 0.05, age also has a p-value greater than 0.05 (0.14), level of education and years in grain business had a p-value greater than 0.05 (0.37 and 0.24 respectively) this findings showed that there is no significant relationship between sex (male or female), age, level of education, and years in grain business and the effect or usage of certain storage practices. This suggests that these factors do not play a significant role in determining whether or not marketers use effective storage practices.

Results is the model summary shows that a 1-step model with a -2 log likelihood of 63.341, a Cox and Snell R square of 0.191, and a Nagelkerke R square of 0.277 indicates a moderate fit. The model is a reasonable fit for the data because it explains a moderate amount of the variation in the outcome variable.

**Table 5: Logistic regression showing the determinants of effect of storage practices**

| <b>Variable</b>  | <b>B</b> | <b>S.E.</b> | <b>Wald</b> | <b>Sig.</b> | <b>Exp(B)</b> |
|--|----------|-------------|-------------|-------------|---------------|
| Sex(male or female)  | 1.01     | 0.67        | 2.29        | 0.13        | 2.75          |
| Age(Number in years)   | 0.07     | 0.05        | 2.18        | 0.14        | 1.07          |
| Level of Education(educated = 1, otherwise = 0)                | -0.81    | 0.90        | 0.80        | 0.37        | 0.45          |
| Years in maize business  | -0.09    | 0.07        | 1.36        | 0.24        | 0.92          |
| Source of Information (fellow maize farmers= 1 and others = 0) | 2.68     | 1.01        | 7.12        | 0.01        | 14.61         |
| U =Error term  | -3.09    | 1.73        | 3.20        | 0.07        | 0.05          |

Source: Field survey, 2023.

#### **Model Summary**

| Step | -2 Log likelihood | Log Cox & Snell R Square | Nagelkerke R Square | R |
|------|-------------------|--------------------------|---------------------|---|
| 1    | 63.341(a)         | .191                     | .277                |   |

## CHAPTER FIVE

### 5.0 SUMMARY, CONCLUSION AND RECOMMENDATION

#### 5.1 SUMMARY

This study was carried out to identify sharp practices, the level of usage, effectiveness and challenges faced by grain marketers in Egor Local Government Area of Edo state, Nigeria. The population of the study comprised of 74 respondents. A well structured questionnaire was used for data collection.

Findings from the study shows that;

Almost equal proportion of both sexes male (51.4%), female (48.6%) and higher percentage of respondents were married (59.5%), age group between 31-40 dominated the market with 33.8%, 37.8% of the respondents had secondary school education.

Maize (55.4%) was the most popular grain sold by respondents, rice is the second most popular grain sold, while sorghum, millet and wheat were all less popular. 6.8% of respondents sold more than one type of grain. 77.0% of respondents had between 30,001 - 50,000 as their monthly income.

68.9% of the respondents got their information from their families. The dominated marketing experience in the study area was below 5 years, it represents 47.3% of the respondents

Awareness of respondents to sharp practices were identified with use of chemicals having 82.4%, mixing of good and bad grains (55.4%), absence of pest control measures (41.9%), contamination of grains (60.8%), improper sanitation (67.6%), damaged storage facility (74.3%), Hoarding of grains to create artificial scarcity (62.2%), falsify record (31.1%) and no storage record (78.4%).

The constraints faced by grain marketers in the study area were identified in descending order of importance to be unavailability of market (3.85), poor hygiene (3.78), difficulty in forecasting market demand (3.72), unavailability of storage material (3.68), difficulty in maintaining storage facility due to bad road network (3.50), low demand of grains (3.48), poor storage condition (3.45), impact of access to information (3.42), theft and security concerns (3.41), impact of limited storage capacity due to seasonal demand (3.27), lack of access to insurance to cover for losses due to storage failure (3.21), climate and weather risk affecting storage (2.96), financial problem (2.86), lack of access to credit to purchase storage facility (2.79), lack of government support (2.59), moisture control problem (2.37), inflation of prices of storage facilities (2.37), pest infestation (2.01) and rodent infestation (1.67).

There is no significant relationship between socio economic characteristics and effect of storage practice in the study area, but there was an exception to the source of information which had a significant relationship with the effectiveness of storage practice in the study area.

## **5.2 CONCLUSION**

From the results of the study, it is observed that the family is the major source of information to the respondents in the study area. It was also observed that the awareness and usage of sharp practices in storing grains in the study area is relatively high. The constraints faced by grain marketers in the study area are numerous with unavailability of market having the highest mean score.

## **5.3 RECOMMENDATIONS**

Based on the study's finding, the following recommendations were made;

- i. Training and programs should be made available especially by extension agents to family members and community leaders to enlighten the marketers on the proper methods of storing grains and also the harm of using sharp practices.
- ii. To take advantage of extension agents and markets outside of their vicinity, marketers should organize themselves into cooperative groups

which could help in lobbying for the construction of new roads or repair of existing roads and easy access to information.

- iii. Marketers should get involved in value addition in order to create market for new products gotten from grains.
- iv. The intervention of the government and non governmental organizations will play a large role by making credits available to marketers for the purchasing and/or building of storage facilities, funding of research to make pesticides suitable for grains in order to reduce the use of harmful chemicals etc.

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**APPENDIX**  
**QUESTIONNAIRE**

**DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION  
SERVICES,**

**FACULTY OF AGRICULTURE,**

**UNIVERSITY OF BENIN,**

**BENIN CITY, NIGERIA.**

**Respondents,**

I am a final year student of the above institution, carrying out a research on the topic, "**SHARP PRACTICES OF STORING GRAINS AMONG MARKETERS IN EGOR LOCAL GOVERNMENT AREA, EDO STATE, NIGERIA**". I wish to request for your timely co-operation by completing this interview guide, the information which would be obtained during this interview will be treated with absolute confidence and for research only.

**BIOWE Helen**

**Researcher**

Thank you and God bless you.

Instructions: please tick or fill in the required information where appropriate.

**A. SOCIO-ECONOMIC CHARACTERISTICS**

1. Sex: Male( ) Female( )
2. Age (in years): \_\_\_\_\_
3. Type of Grain: \_\_\_\_\_

4. Education: 1.Primary education ( ) 2.Secondary education ( ) 3. Tertiary education ( ) 4. Non-Formal education ( )
5. Years in grain business: \_\_\_\_\_
6. Religion:1.Christian( ) 2.Muslim( ) 3.Traditional worshipper( )  
4.Others(specify): \_\_\_\_\_
7. Marital status: 1. Single( ) 2.Married( ) 3. Divorced ( ) 4. Widowed( )  
5.Separated( )
8. Monthly income from grain production: \_\_\_\_\_
9. Source of information (on how to store grains): 1.Radio ( ) 2. Research institute ( ) 3. Family ( ) 4. Grains farmers association ( )

## B. AWARENESS OF VARIOUS SHARP PRACTICES

This table shows the various sharp practices, indicate (✓) the one you are aware of.

| S/N | SHARP PRACTICES                               | YES | NO |
|-----|---|-----|----|
| 1.  | Use of chemicals                              |     |    |
| 2.  | Mixing good and bad grain                     |     |    |
| 3.  | Absence of pest control measures              |     |    |
| 4.  | Contamination of grains(with sand and stone)  |     |    |
| 5.  | Improper sanitation                           |     |    |
| 6.  | Damaged storage facility                      |     |    |
| 7.  | Hoarding grains to create artificial scarcity |     |    |
| 8.  | Falsify storage records                       |     |    |
| 9.  | No storage record                             |     |    |

Others:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

4. \_\_\_\_\_

### C. SHARP PRACTICE IN USE AND LEVEL OF USAGE

This table shows sharp practices, indicate (✓) how often they are used, if they are used.

| S/n | Sharp practices                               | Very often | Often | Undecided | Not often | Not very often |
|-----|---|------------|-------|-----------|-----------|----------------|
| 1   | Use of chemicals                              |            |       |           |           |                |
| 2   | Mixing good and bad grains                    |            |       |           |           |                |
| 3   | Absence of pest control measures              |            |       |           |           |                |
| 4   | Contamination of grains (with sand and stone) |            |       |           |           |                |
| 5   | Improper sanitation                           |            |       |           |           |                |
| 6   | Damaged storage facility                      |            |       |           |           |                |
| 7   | Hoarding grains to create artificial scarcity |            |       |           |           |                |
| 8   | Falsify storage records                       |            |       |           |           |                |
| 9   | No storage record                             |            |       |           |           |                |

### D. EFFECTIVENESS OF THE STORAGE PRACTICE

The table below shows all storage practice, indicate (✓) the effectiveness of each practice using the scale, VE - Very Effective, E -Effective, U -undecided, NVE -Not Very Effective, NE -Not Effective

Tick appropriately

| S/N | STORAGE PRACTICE                              | VE | E | U | NVE | NE |
|-----|---|----|---|---|-----|----|
| 1.  | Use of chemicals                              |    |   |   |     |    |
| 2.  | Mixing of good and bad grains                 |    |   |   |     |    |
| 3.  | Absence of pest control measures              |    |   |   |     |    |
| 4.  | Contamination of grains (with sand and stone) |    |   |   |     |    |
| 5.  | Improper sanitation                           |    |   |   |     |    |
| 6.  | Damaged storage facility                      |    |   |   |     |    |
| 7.  | Hoarding grains to create artificial scarcity |    |   |   |     |    |
| 8.  | Falsify storage records                       |    |   |   |     |    |
| 9.  | No storage record                             |    |   |   |     |    |

#### D. CONSTRAINTS

The table below shows possible challenges faced in maize storage

Tick(✓) appropriately the severity of these challenges. Very Serious (VS), Serious (S), Undecided (U), Moderately Serious (MS), Not Serious (NS).

| S/N | CHALLENGES  | VS | S | U | MS | NS |
|-----|---|----|---|---|----|----|
| 1.  | Pest infestation  |    |   |   |    |    |
| 2.  | Moisture control problem                                  |    |   |   |    |    |
| 3.  | Impact of limited access to information                   |    |   |   |    |    |
| 4.  | How severe is climate and weather risk affecting storage  |    |   |   |    |    |
| 5.  | Theft and security concerns                               |    |   |   |    |    |
| 6.  | Impact of limited storage capacity due to seasonal demand |    |   |   |    |    |

|     |   |  |  |  |  |  |
|-----|---|--|--|--|--|--|
| 7.  | Financial problems  |  |  |  |  |  |
| 8.  | Rodent infestation (eg Rat, bird etc)                                   |  |  |  |  |  |
| 9.  | Poor storage conditions (eg inadequate ventilation)                     |  |  |  |  |  |
| 10. | Poor hygiene  |  |  |  |  |  |
| 11. | Unavailability of storage material                                      |  |  |  |  |  |
| 12. | Unavailability of market  |  |  |  |  |  |
| 13. | Lack of government support  |  |  |  |  |  |
| 14. | Lack of access to credit to purchase storage facilities                 |  |  |  |  |  |
| 15. | Inflation of prices of storage facilities                               |  |  |  |  |  |
| 16. | Low demand of grains  |  |  |  |  |  |
| 17. | Difficulty in maintaining storage facility                              |  |  |  |  |  |
| 18. | Difficulty in forecasting market demand                                 |  |  |  |  |  |
| 19. | Difficulty in accessing storage facility due to bad road network        |  |  |  |  |  |
| 20. | Lack of access to insurance to cover for losses due to storage failure. |  |  |  |  |  |