FACTORS INFLUENCING THE USAGE OF MODERN WAREHOUSING FACILITIES BY CEREAL FARMERS IN TURBO EAST AND WEST SUB-COUNTIES OF UASIN GISHU COUNTY, KENYA

BY

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DECLARATION

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APPROVAL

This work has been submitted for examination with our approval of University Supervisors.

DEDICATION

This study is dedicated to my family members. Their encouragement, sacrifice and love made the completion of this study possible.

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Firstly, I thank the heavenly father for giving me this opportunity, courage, strength and guidance that made this study possible. Secondly, I would like to express my sincere gratitude and appreciation to my supervisor Mr. Gerald Ondiek and the chairman of the panel Dr. Machuki who guided me with positive criticism, persistent motivation and endless patience towards producing high quality work. Their sacrifices, goodwill, dedication and compassion are truly appreciated. Thirdly, I am as well grateful to Mr. Jaleha Alex the coordinator Kisumu campus as well as all members of staff both teaching and non-teaching in the Department of business. Their encouragement, assistance, comments, suggestions and criticism inspired me to complete this work.

ABSTRACT

A large number of warehouses exist worldwide including the state of the art, professionally managed warehouses as well as company stores such as raw materials and components stores, finished goods stores etc. warehousing activity links the producer with the customer and plays critical role of providing a desired level of customer service at the lowest possible total cost. Nowadays warehousing function has become one of the most important functions of a firm's logistics system. Modern warehousing of cereals is causing a devastating effect to cereals farmers all over the world. Farmers are the people who are better placed to adopt the usage of modern warehouses in their storage of cereals because of the high benefits. Although the Kenyan government realized the magnitude of the problem and introduced some public modern warehousing facilities with Eldoret town that forms part of Turbo East and West, its usage and adoption is so slow. This study analyzed the factors that influence the usage of modern warehousing facilities in Turbo East and Turbo West sub counties of Uasin Gishu County. It examined the frequency of usage of these modern warehousing facilities, availability of these modern warehousing facilities. The study used the innovation decision process theory Roges (1998) and the theory of planned behavior. Most of these theories and models used social psychology framework to study believes knowledge, thoughts, behavior and perception of people. The methodology of the study used survey research design in which data was collected using questionnaires. The unit of analysis was the farmers in Turbo East. Data were analyzed using both descriptive and inferential statistics. Descriptive statistics include use of frequency tables while inferential statistics include use of the chi square. The Statistical Package for Social Sciences (SPSS) was used to compute the statistics.

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1.1 Background of the study

The need to add value to a product and at the same time add cost to the product has always been one of the major reasons that has made farmers stores their cereals in warehouses. Holding goods in a warehouse causes stoppage or interruption to the flow of goods, which in turn adds cost to the product. Bhat (2011) defines warehousing function as concerned with physical handling of raw materials and component parts until they are used in the production process. The warehouse is a point in the logistic system where a firm stores or holds raw materials, semi-finished goods or finished goods for varying periods of time.

Bhat (2011) explains the warehousing roles which include consolidation. It means collecting smaller quantity of goods to form a larger quantity in order to realize lower transportation rates. By moving the less-than truckload (LTL) shipments relatively short distances to and from a warehouse, warehousing can allow a firm to consolidate smaller goods into a larger quantity of goods (a car load or truck load) with significant savings in transportation. For the inbound logistics system, the warehouse would consolidate different suppliers LTL shipments and ship a truck load shipment to the firm's plant. For the out bound logistics system, the warehouse would receive a consolidated volume shipment from various plants and ship LTL shipments to different markets.

Another major usage of warehousing is to provide service to customers. Having goods available in a warehouse when a customer places on order, particularly if the warehouse is in a reasonable proximity to the customer, usually leads to customer satisfaction. Hill (2007) defines customer satisfaction as customer's positive attitudes and feelings that customers hold about their experience with an organization. Such positive attitude are manifested in outcomes such as customer loyalty, customer focus and customer satisfaction has been the main agenda for most businesses seeking to improve their competitive advantage, consequently, in the recent years focus on customer satisfaction has increased rapidly. The main focus regarding customer satisfaction should be on the collection of best practices and the preparation of guidelines for efficient delivery of services so as to improve customer experiences with organization (Eupan, 2007).

Finally, the fourth warehousing usage is protection against contingencies such as delays in transportation, vendor stock outs or strikes by truck operators. Physical supply warehouses

stuck large inventories of raw materials to avoid production holds ups due to shortage of raw materials. Contingencies can also occur with physical distribution warehouses. For example, goods damage in transit can affect inventory levels and order filing. One approach that has been adopted by both large and small scale farmers over the world has been adoption of modernization in storing the farm produce. Warehousing helps to improve efficiency and productivity which is a major focus in warehousing operations.

Cereals storage is a menace that has not been dealt with properly. The local impoverished men and women cannot afford to use the modern ways of presenting their produce of cereals. They eventually end up using the traditional methods which are outdated and eventually face economic starvation with the introduction of modernization in cereals storage. Farmers are expected to play a great role especially in terms of training on warehousing facilities and importance to avoid cereals destruction as a result of poor storage and preservation among the local farmers that this study seeks to focus on adoption and the establishment of modern cereals storage facilities in the regions well known for cereals production particularly Turbo east and Turbo west sub counties of Uasin Gishu county.

1.1.1 The concept of warehousing

Bhat (2011) indicates that warehousing is an integral part of any logistic system. It can be defined traditionally as the storage of goods. But in the context of logistics management, we can define warehousing as that part of firms logistics system that stores products raw materials, work in progress and finished goods at and between the point of origin and point of consumption. It also provides information to managers on the status, condition and disposition of the items being stored.

Before the arrival of just-in-time, strategic alliance and logistics supply chain philosophies, warehousing served the strategic role of long term storage for raw materials and finished goods. Manufactures usually used the approach of "manufacture to stock and sell" which involves storage of inventory in warehouses so as to meet the anticipated future demand. The inventory level in warehouse was usually 60 to 90 day's supply. But nowadays warehouse has taken a strategic role of attaining the logistics goal of shorter cycle times, lower inventories, lower costs and better customer service. In many firms, the products are stored in warehouses for just a few days or even a few hours.

Lysons and Farrington (2006) states that warehousing operation entails all the activities that are carried out in a warehouse, how they are carried out and what determines how they are carried out. Efficient warehousing of cereals entails activities that include recording the amount of cereals stored in terms of kilograms which include the dry cereals, cereals handling, insurance of facility against any damage like fire and theft and finally coding. In well established cereals storage facility, there are computerized systems of recording. This kind receives input data, carry out a computation or process unit, and the results. The input can be keyed in directly using the keyboard or read by appropriate devices from printed characters, box in code, magnetic disk or tape, punched cards and other media, the output will either be displayed on the screen or take the form of a print out.

In most cereals storage facilities, computers are generally used to maintain and manipulate stock records; stock control is an ideal area for the application of electronics data processing involving storage of large amounts of information and the performance of a variety of procedures and process using this information. The manual system entails the use of stock record cards. The recording is done manually in putting data of the stock records received in the warehouse. The stock records can be kept in the three ways which shows quantities and unit prices, quantity, price, value of each transaction and the total value of balance of stock.

There are quite a number of reasons for maintaining cereals as a stock record in a warehouse which include indicating the amount of cereals at any given time without it being necessary for the cereals sacks to be counted physically. This is done in terms of weighed cereals i.e. in kilograms. It is also done to establish a link between the physical stock and the stock account all the receipts and issues of cereals course adjustments accounts are up to date, the sum of the quantity balances on the records when paid and evaluated should be equal to the value on the corresponding stock control account. The recording is also done as a means of provision i.e. to determine how much should be ordered to maintain stock of cereals at required level.

The cereals storage in turbo which is one of the warehousing operations entails posting small scale and mostly the traditional methods of cereals preservation methods. The cereals is eventually stored into the small warehouses around the cereals growing zones by small scale farmers and even the larger scale farmers. These places have no adequate facilities for cereals storage and therefore have proved to be very expensive and undoubtedly reduced the life of the stock of cereals. It also produces premature deterioration and all the damages that go with it.

The cost factor is vital and therefore is another factor to consider. In terms of the operation cost, profits and the overall cost in terms of equipment, plant time and labor therefore the more efficiently and quickly the cereals can be moved the less the cost per unit. In some warehouses, most of the cereals stored handling is done by the machines such as the cranes and the hand and trolley, large and well equipped warehouse have forklift and cranes for moving heavy items.

According to Carter (2011) most of the well known and established cereals storage facilities provide for insurance which consists of coverage protection against loss which can cause the warehouse bankrupt leading to its closure. The insurance of this cereals storage facility provides the protection of this against buildings which offers coverage for permanently installed features machines and equipments against theft, damage and perishability. There are also workers compensation workers spend time moving and handling materials, thus exposing them to danger of injury. Workers compensation provides medical cover for employees who are injured.

For the marketing of cereals and distribution to be effective and successful, it's important that the products be readily available to be delivered to customers on demand. By warehousing cereals close to the customers, delivery time has been reduced or off-the shelf supply can be achieved thereby improving customer service. The faster on time delivery can help increase sales.

According to the Ministry of Agriculture (2008) on the benefits of warehousing found out that it is necessary to achieve economies in transportation and production. To maintain a dependable source of supply, to meet the fluctuations in demand due to seasonality and differentials between the firm and its customers, to achieve the desired level of customer service at the least total logistic costs, to support just-in-time programs of the suppliers and customers, to provide temporary storage of materials to be disposed of or recycled packaged materials in the reverse logistic chain and to maintain a dependable source of supply Bhat (2011). It is therefore reported that the benefits of warehouses are enormous to the farmers and the owners and hence it will be out of interest to investigate the various factors influencing their usage and establishment.

1.1.2 Adoption and innovations of modern warehousing

Rogers (1995) define adoption as a process through which an individual or other decision making unit passes from first knowledge of an innovation, to forming an attitude toward the innovation, to decision to adopt or reject, to implementation of the new idea and to confirmation of this decision. In a nutshell to adopt an innovation means to acquire a new product or behavior and to diffuse can be said to be the means through which its presence spread amongst people. According to Rogers (2005) adoption is similar to diffusion except that it deals with the psychological processes an individual goes through, rather than an aggregate market process. In his study he comes up with a curve innovation adoption curve which enable him conclude that it is useful to remember that trying to quickly and massively convince the mass of a new controversial idea is useless, it make more sense to start with convincing innovators and early adopters first. He further concludes that diffusion is determined by five key elements. The characteristics of an innovation which may influence its adoption. The decision-making process that occurs when individuals consider adopting a new idea, product or practice. The characteristics of individuals and society of adopting an innovation and communication channels used in the adoption process.

Choi (1997), Rosenberg (1982) identify attitude, subjective norms, beliefs, ease of use and usefulness as the drivers of adoption in banks in developing countries. Unfortunately their studies did not show that factors could affect other sectors like in Agriculture nor did their studies show that the same factors could affect adoption in Kenya. Rogers, (1995) in addition states that five elements that affect adoption did not indicate that the elements could help in analyzing extent of adoption in any industry or environment.

1.1.3 Cereal farmers in Kenya

According to Paul Lunde (1992) agriculture is the backbone of Kenya's economy, well managed agriculture can be the single source that will spearhead the economy and alleviate poverty among the 80 percent of Kenya's population dependent on it. Turbo as an agricultural zone covers 1088 square km. at the time of the 2009 census current Turbo sub county area had a population of 358,332 persons. Eldoret is Kenya's 4th largest town. It houses the headquarters of Eldoret west District as well as Eldoret east and Eldoret North. Eldoret west has few tarmac roads leading into a major- market Eldoret. The road from Soi Division headquarters to Eldoret is good with a few potholed sections. Turbo the other Division lies on the main tarmac highway joining Eldoret and Kitale that is in perfect condition. However feeder roads from the interior where the bulk of the farmers live are very

dusty in the dry season and trouble during dry seasons. According to Dennis Limo, a farmer in one of the location, the roads are a nightmare when it drizzles and impassable when it rains heavily or for a long time.

The Ministry of Agriculture (2009) categorized farm holdings in the sub-county into three groups according to average farm sizes, as shown in Table 1.1

Table 1.1: Farm sizes

Area farm size	Category
1-20 ha	Small scale farms
21-40 ha	Medium scale farms
41 ha and over	Large scale farms

Source: Researcher 2013

Eldoret County receives an annual average rainfall ranging from 900mm to 1200mm. The main rainy seasons start in late March or early April and peaks in July/August. The wettest months are April, May and August. The average temperature is 18 degrees centigrade. Farming is the main stay of Eldoret East and West District that form Eldoret Sub County. The county is one of the high agricultural potential counties in Kenya and is highly referred to as part of the grain basket of the country. It produces cereals in large quantities. People of this county know very little outside the main agricultural activities of livestock, wheat and cereals.

According to Bates (1989) a government based on the support of export crop products emphasized investment and the accumulation of economic wealthy whereas a government based on the support of food grain producers emphasized the redistribution of wealth and ever since 1978, there has been a remarkable increase of cereals production as the administration increase emphasis an cereals, many other business sprung that supported farmers and farming activities like sales of farm inputs, transportation, storage and processing. There are some farmers support structures like Kenya Farmers Association (KFA), Agricultural Finance Association (AFA), Kenya Planters Cooperative Union (KPCU), Kenya Grain Growers Cooperative Union (KGGCU). All these support structures supported the modernization in storage of the cereals that is produced in bulk in these regions but eventually went under due to embezzlement, mismanagement and political interference. It is further reported that the various storage facilities that are traditional are inadequate to

handle bulk storage and hence it will be of interest to investigate the various factors that influence the adoption and establishment of modern warehousing facilities in major cereals producing areas in Kenya.

1.2 Research problem

A study by the ministry of Agriculture et al (2009) on the effect of warehousing on farmers suggest that warehousing of cereals is one of the most devastating issues in the world and the cereals farmers in Rift Valley particularly the cereals production zones like Turbo east and west sub counties are mostly affected. Although the Kenya government has realized the magnitude of the storage problems among the farmers and has established some few warehousing facilities in these zones. It's not clear why its usage and establishment in this region is slow. Some of the enablers to warehousing are; achieve economies in production, maintain a dependable source of supply, meet the fluctuations in demand due to seasonality and competition and support just-in-time programs of suppliers and customers Bhat et al (2011). With the rapidly changing business environment affecting challenges and opportunities to organizations, observing organization value is of utmost importance and imperative for organizational sustainability. For this reason the number of organizations preferring to adopt and establish warehousing facilities is on the increase for the purpose of increasing the customer satisfaction and consequently increases the competitive advantage for the department. Lewis et al, (2004).

This is very a serious problem considering that introduction of modern cereals storage facilities in Turbo is important in controlling further loss and destruction of the crop by weevils and other pests being a perishable commodity. Moreover the factors that influence the adoption of using these modern warehousing facilities in the cereals growing zones have not been studied. The current study is therefore an attempt to fill the gap with a view to improving the usage of warehouses in Turbo cereals growing zones. There is therefore a need to develop a suitable surveillance and control for systems for cereals loss and destruction in order to keep this menace below economic injury levels.

This raised the question, to what extent have farmers in Turbo sub County adopted the usage of modern warehousing facilities and what are the factors influencing the usage?

1.3 Research objective

The overall objective is to determine the factors influencing the establishment and adoption of warehousing facilities in Turbo sub County. The study is guided by two specific objectives: which are

i. To determine the extent of usage of modern warehousing facilities in Turbo sub County by farmers.
ii. To determine the factors that affect both small scale and large scale farmers adopting modern warehousing facilities.

1.4 Value of the study

In Kenya most cereal famers have shown dismal performance in terms of storing their cereals with some on the verge of giving up. This trend often reverse when practiced with some tuning into very productive farmers. This study therefore generates information that would be useful for the small scale and large scale farmers and generate a leaf of knowledge from farmers who have been using modern warehousing facilities that would be of consequences to the farmers who are non - members of the facilities.

The study intends to establish objective inferences that are devoid of haphazard and subjective personal judgements and experiences. The findings and recommendations are therefore useful to small scale farmers and large scale farmers and the warehousing managers. It would also add to the stock of ideas and concepts of former researchers and scholars, a combination which may lead to better methods, regulations and policies in improving results to farmers without too much wastage.

This research seeks to study the realities regarding the warehousing of cereals and factors influencing its adoption. As a result of the clear objectives, cereals storage is a major issue in Eldoret Sub County. This research is useful in adding insight into the peculiarities that influence the usage of modern warehousing facilities in. The study is seeking to point out if there is any trend in farmer's reactions towards the adoption of modern warehousing facilities. This study will help farmers realize the best way to ensure that modernization in cereals storage is quickly accepted by farmers. The learning institutions and researchers will also have a benchmark from which to base their future studies from thereby helping Kenyan scholars to participate more on the global platform. Given that Agriculture is the backbone of our economy the study is important in that the government will benefit through increased revenue. Finally the research should be beneficial to the researchers in the whole globe who may be interested in improving storage and organization value.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter covers literature review on factors influencing the adoption and establishment of modern warehousing facilities. The chapter reviews literature from the past studies, although several researchers have put a lot of effort to investigate the factors influencing modernization in cereals storage, very few have gone further to study the factors that influence the adoption and establishment of modern warehousing facilities for cereals. The researchers seek to review the various models that affect the acceptance of modern warehousing facilities. These are summarized using a conceptual framework.

2.2 Theory underpinning the study

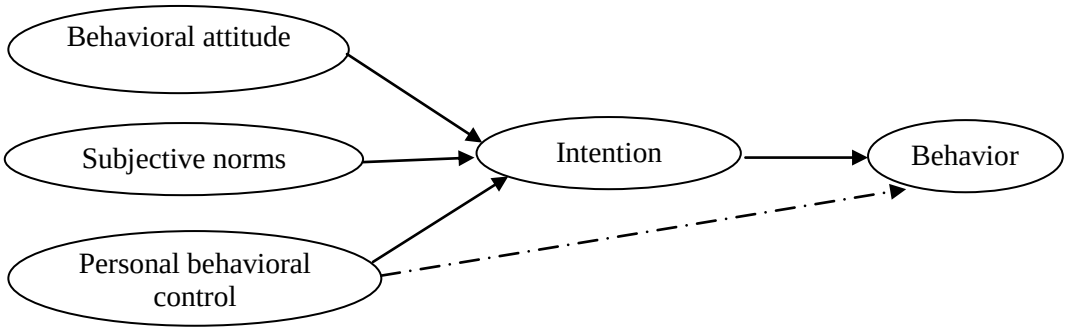
The theories that form the basis for this study include innovation decision process theory Rogers (1998) and the theory of planned behavior .Most theories and models use social psychology framework to study believes, knowledge, thoughts, behavior and perception of people .A high number of models and theories have arisen which aim to uncover the factors that will influence the adoption of modernization in doing things.

The innovation decision theory is one of the adoption diffusion theories presented by Everett Rogers (1995). Diffusion of innovation is a theory of how, why, and at what rate new ideas and technology spreads through culture, operating at individual and firm level. The theory sees innovation as being communicated through certain channels over time and within a particular social system Rogers (1995). Individuals are seen as possessing different degrees of willingness to adopt innovations, and thus, it is generally observed that the portion of the population adopting an innovation is approximately normally distributed over time Rogers (1995). Rogers (2003) Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. The more compatible the technology will be to users, the less a change of behavior is required, therefore allowing for faster adoption. Treatability is the extent that the innovation can be tested and experimented before its inclusion. The complexity (its ease of use) of technology will also impact on adoption. If the use of technology requires considerable learning, it is less likely that the users will preserve with it and observability is where the innovation use and effects must be visible by others.

Theory of planned behavior was first forwarded by Ajzen (1995). According to the theory, human behavior is guided by three kinds of considerations, beliefs about the likely outcome

of the behavior and the evaluations of these outcomes (behavior beliefs), beliefs about the normative expectation of others and motivation to comply with these expectations (normal beliefs), and beliefs about the process of factors that may facilitate or impede performance of the behavior and the perceived powers of these factors (control beliefs). In their respective aggregates, behavioral beliefs produce a favorable or unfavorable attitude towards the behavior; normative beliefs result in perceived social pressure or subjective norm; and control beliefs give rice to perceived behavioral control. In combinations, attitude towards the behavior; subjective norm, and perception of behavior control lead to the formation of a behavioral intention. As a general rule, the more favorable the attitude and subjective norm, and greater the perceived control, the stronger should be the person's intention to perform the behavior in question. Finally, given a sufficient degree of actual control over the behavior, people are expected to carry out their intentions when the opportunity arises. Intention is thus assumed to be the immediate antecedent of behavior. However, because many behaviors pose difficulties of execution that may limit volitional control. It is useful to consider perceived behavioral control in addition to intention. To the extent that perceived behavioral control is veridical, it can serve as a proxy for actual control and contribute to the prediction of the behavior in question. The following figure is a schematic representation of the theory since Wicker's (1969) review of research examining the relationship between attitudes and behavior, and his conclusion that attitude probably do not predict behavior; social psychologists have sought to improve the predictive power of attitudes. If the farmer felt in control of use of the modern warehousing facilities, such that they would not be at the mercy of another party or the government, they would be willing to use it.

Figure 2.1: Shows the behavior, intention and attitudes of farmers .

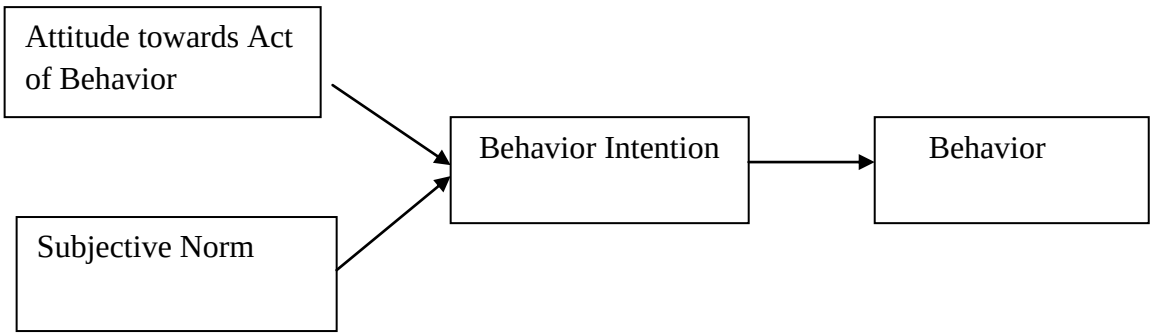


Source: TBT Theory adopted from Ajzen and Fishbein (1980) model.

According to Ajzen and Fishbein (1980) theory of reasoned action suggest that a person's behavior is determined by his/her intention to perform the behavior and that this intention is,

in turn, a function of his/her subjective norm. The best predictor of behavior is mention. This intention is determined by three things, their attitude toward the specific behavior, their subjective norms and their perceived behavioral control. The theory of planned behavior holds that any specific in question can be expected to predict that behavior. In this case if the farmer thinks of the usage of warehousing as being convenient to use not requiring difficult and expensive to adopt requirements, possibly not interfering with their routine way of life listed in the model then he would easily adopt its usage.

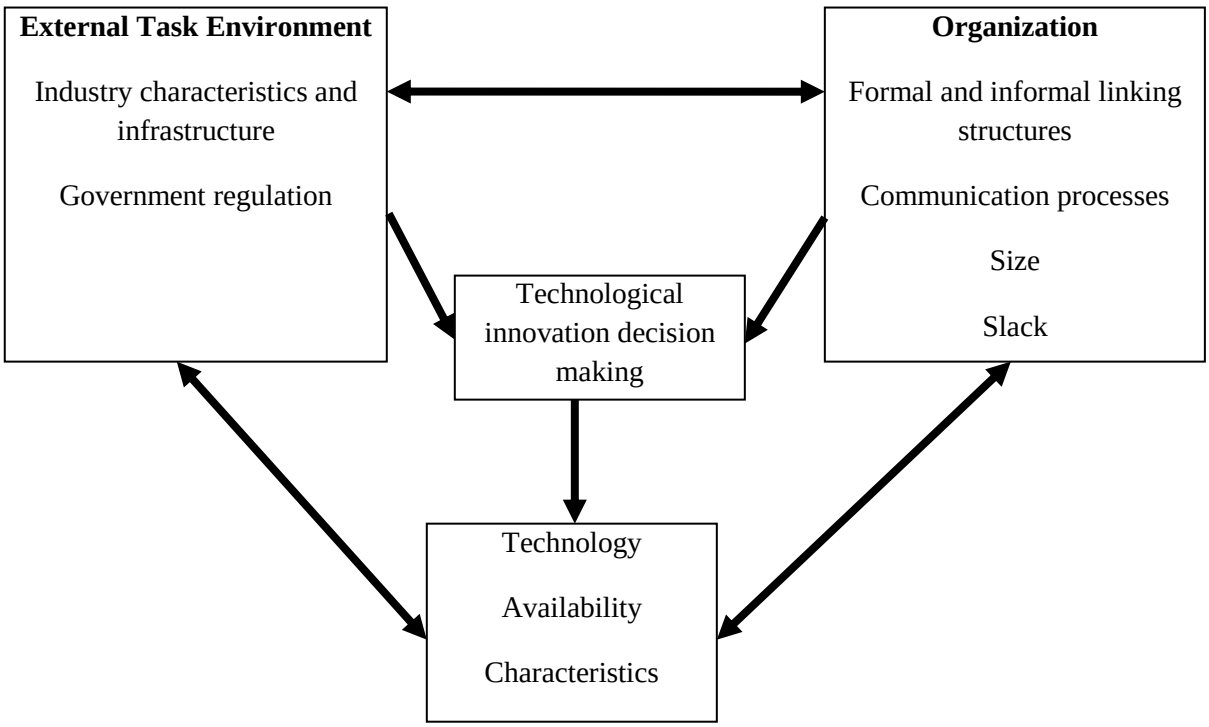
Figure 2.2: Behaviour, intention and Attitudes of Persons



Source: TRA theory adopted from Ajzen and Fishbein (1980) model

There is also the technological environment organizational model by Tornatzky and Fleischer (1990) model framework which had internal and external factors that affect adoption of an innovation, in their analysis they conclude that diffusion of an innovation is influenced by three factors: Technology, Organizational and Environmental factors that the TOE framework identifies these factors that influence the process by which it adopts, implements and uses technological innovations. Studies by Tornatzky and Fleischer (1990); Rogers Thond (1999), Zulu Et al (2005) conclude that technological factors include both the existing such as traditional storage methods and technology in use and new technologies relevant to the firm; organizational factors as descriptive measures about the organizational such as scope, size and the amount of slack resources available internally and environmental factors as the area in which a firm conducts its business – its industry, competitors and dealings with the government. In this case if the farmers who frequently use the warehouse develop positive attitude, they would be more willing to adopt it than of they were suspicious of it or of the service providers.

Figure 2.2: Shows technological environment.



Source: TOE adopted from Tornatzsky and Fleischer, 1990

2.3 History and approaches of warehousing

History of warehousing is still relatively unexplored. Cereal storage has shifted from the traditional methods to the modern ware housing systems. The traditional storage practices encompassed the use of calabashes, guards, earthen ware and pots and storage baskets also known as cribs. All these traditional storage methods were not very efficient as they were prone to weevils and rotting of the grain which was that to the farmers. Some farmers also used the ashes as chemicals before storing all grains; the ash was sprayed on the grain before putting into other containers such as guards. These were meant to protect the grains from being attacked by the weevils. These traditional methods had other disadvantages in that some external products like rats could easily find their way in and cause destruction. The methods also exposed the grains to pilferage causing economic loss. Fishbein (1980)

Currently there are temporary storage methods that are beneficial especially associated with the drying of the crop and are primarily intended to serve this purpose. They assume the function of storage only if the grain is kept in place beyond the drying period. There is the Aerial storage. In this method; cereals cob, sorghum or millet particles sometimes tied in bundles which are then suspended from tree branches, posts or tight lines, in or inside the

house. The precarious method of storage is not suitable for very small or large quantities and does not provide protection against the weather especially if outside, insects, rodents or thieves.

There is also the storage ground, or on drying floors. The method can only be provisional since the grain is exposed to all pests, including domestic animals and the weather usually it is resorted to only if the producer is cancelled to attend to some other task, or lacks means for transporting the cereals grains to the warehouse for safe storage.

The other method is the open timber platforms which consists essentially of the number relatively straight poles laid horizontally on the series of upright posts. If the platform is constructed inside a building it may be raised just 35-40cm above the ground level to facilitate clearing and inspiration, platforms in the open may be raised at least 1 meter above ground level. They are usually rectangular in shape, but circular or polygonal platforms. The grain is stored on platforms in heaps, in woven baskets or in bags. In some of the humid places fire may be lit under elevated platforms, to dry produce and deter insects or other pests.

2.4 Nature and importance of warehousing

The warehousing function is concerned with physical handling of raw materials and component parts until they are used in production process. The warehouse is a point in the logistics system where a firm stores or holds raw materials, semi finished goods or finished goods for saying period of time. Holding goods in a warehouse causes storage or interruption to flow of goods which interim adds costs to the products.

Ideally if the demand for firm's products were known, for certain and products could be produced and supplied instantly to meet the demand, no inventories need to be held and storage would not be necessary. But it is impractical and non-economical to operate a firm without having any inventory since demand cannot be accurately predicted. Therefore many firms use inventories to improve supply and demand coordination and to keep the overall costs at the minimum possible level. Maintaining inventories gives rise to the need for warehousing and the need for material handling as well as logistics management Bhat (2011) thus storage becomes an economic convenience rather than an economic necessity.

In a micro-economy sense, warehousing performing a very important function. It creates time utility for raw materials, supplies and finished goods .By locating the finished goods,

warehouse nearer to the market, a firm can serve its customers with shorter lead times. By warehousing a firm or a farmer can make its goods available when and where customers demand them. Warehousing provides both time utility and place utility thereby enables the firm to use customer service as a dynamic value adding competitive tool.

Storage warehouse are also furnished with many security features such as surveillance camera as well as burglar alarm. Some even employ security guards to secure the whole area of the facility .The majority of the storage warehouse are made up of metal building. All of the building's parts like beams, frames, walls, roofs are from high quality. With these materials, the structure is more flexible and can be modified easily in less time compared to the warehouse made of wood or concrete.

Many storage warehouses are centrally located in areas adjacent to key destinations and where transportation is accessible Bhatt (2007). Warehouses owned by big businesses are often large enough to accommodate a good number of consumers in the country of operation. This allows them to easily distribute the goods without having to ship from to country. Also, the development of internet has had a great influence on the system of warehousing .Inter based stores do not need any physical point of selling only require storage warehouse to gather all needed goods for the consumer.

2.5 Reasons for warehousing of cereals

There are four basic reasons for storage or warehousing of cereals which include reducing transportation and production costs. The warehousing and materials handling costs are justified because they can be traded off with transportation production and purchasing costs. For example, by warehousing cereals, the production cost can be lowered through economical production and sequencing. Further, warehousing inventories can result in lower transportation costs through the shipment of larger, more economical quantities. The objective should be to use just enough warehousing so as to realize a good, economical balance among warehousing, production and transportation.

Warehousing of cereals plays a major role in coordinating supply with demand, especially in firms with highly seasonal production with reasonably stable demand, on the other hand, firms producing products that have a seasonal and uncertain demand produce at a constant level throughout the year in order to minimize production costs by better utilization of the available capacity and build inventories needed to meet the demand during short selling

seasons. Therefore, whenever it becomes too expensive to precisely balance supply and demand, warehousing becomes necessary. Also for material and products which experience high degree of price fluctuations, a firm may have to purchase in bulk at times to take advantage of low prices thereby creating inventories that need warehousing.

It assists in the marketing and distribution of cereals. For distribution to be successful the products should be readily available to be delivered to customers on demand .By warehousing a product close to the customers, delivery time can be reduced or off the shelf supply can be achieved thereby improving customer service .The faster on time delivery can help increase sale of cereals.

Bhat (2011) says that it is important that the products be readily available to be delivered to customers on demand. By warehousing a product close to the customers, delivery time can be reduced or off-the shelf supply can be achieved thereby improving customer's services. The faster, on time delivery can help increase sales.

For some products such as cheese, wines and liquors, the manufacturing process consists of phase where the products most necessarily be warehoused for aging. For certain products which are exported, it's necessary to store them in "banded warehouses" until the time of sale.

2.6 Warehousing Philosophy

Warehousing is the integral part of the logistical operation solution which is concerned with the physical handling of raw material and components parts until they are used in the production and achieving economies in production Bhatt (2007). It also helps in achieving the desired level of customer service at the least total logistics cost. In addition, warehousing of cereals provide temporary storage of material to be disposed or recycled (packaged materials) in the reversal logistics chain.

A distribution warehousing is a building and a place where items for distributions are stored. It serves as storage for product from the manufacturer to the distributor before the cereals are distributed to the retails customer. For instance, after the harvesting farmers would want to distribute it to customers from all over the world and so to do this they are going to distribute these goods or items to the distributor on a certain area. The zones have massive amount of cereals to be distributed, the distributor requires this distribution warehousing where they can easily store these goods before distributing to retail stores. Most distributions warehouses that

are used by farmers even have warehouse storage system to make storing cereals, sorghum and wheat product safe and more convenient.

There are quite a number of benefits of having a distribution warehouse of cereal which include saving time. A distribution warehouse can really save distributors a lot of time when it comes to distributing all the cereals. This is because they no longer have to rummage through the items just to deliver them to various retails stores. It can save workers a lot of time and effort trying to distribute the products or in managing their cereals.

A distribution warehouse the best solutions to protect the goods or the products that distributers are trying to distribute to retail out lets. In a distributions warehouse, all goods are kept in good conditions and retain their qualities. This is because a distribution warehouse is built to achieve these things. They are usually built with the right temperature that can help distributors achieve their purpose in terms of preserving the quality and the condition of the product. This way, they can save a lot of money as they are going to prevent the spoiled and damaged cereals.

Aside from the technical benefits you are likely to get with a distributions warehouse, you can also benefit a lot from the peace of mind that it's going to give you. Since your good and product are well protected, organized and safe as well as since the workers won't have to exert much effort and time, you will have the peace of mind that your business will progress.

CHAPTER THREE: RESEARCH METHODOLOGY

3. 1 Introduction

This chapter discusses the methodology procedure used in data collection and analysis discussed in details in research design, study areas unit of analysis, sampling procedure and sample size. Finally data collection and data analysis technique are discussed.

3.2 Research design

The study used descriptive survey design. Descriptive survey is co-method of collecting information by interview and administering a questionnaire to a sample of individual (Orodho, 2003). The major purpose of descriptive research is the description of the state of affairs as it exists and then repairing the findings.

Kerlinger, (1995) points out that descriptive study is not only restricted to fact findings, but may also often result into formulation of important principles of knowledge and solution to significant problems Kerlinger, (1995) it can be used when collecting information about peoples attitude, opinion, habit or any of the variety of education, economic or social issues (Orodho and kombo, 2002) The study analyses information about the extent to which the cereals storage facilities were available to farmers and how frequently are the storage facilities used by the farmers in these cereals growing zones in the Rift valley and the contributions of the agriculture department especially the ministry of agriculture towards the adoption of cereals storage facilities along the growing zones.

3.3 Study population

Ary et al. (1972) define population as consisting of all the subjects you want to study and a sampling as the process of selecting a group of subjects for a subject in such a way that the individuals represent a larger group from which they are selected. This representative portion of a population is called a sample. Target population is the population to which the researcher wants to generalize the results on Manoj (2003). The study was carried out in Eldoret sub County of Uasin Gishu. The study population for this research was all domestic and small scale farmers. The Sub County was chosen based on the prevalence of the cereals milling companies especially when it comes to storage and use of modern cereals storage facilities. These warehousing facilities are highly expensive to establish. In addition, the presence of many organizations educating people on the species of cereals that can do well and can withstand easy destruction when stored is a clear indication that this menace is highly prevalent.

The unit of analysis was an individual farmer in Turbo region of Uasin Gishu County. The study population for this research will include all domestic and small scale famers served by both public and private warehousing facilities. The study targets a total population of 462 both small scale and large scale farmers within Turbo Sub Counties of Uasin Gishu.

3.4 Sampling procedure

The study employs purposive sampling technique. In this sampling method, the researcher purposely targets a group of people believed to be reliable for the study Kombo and Trome (2006). The farmer were purposely selected because they are charged with the responsibility of growing and handling cereals harvested from their farms and they have first – hand information about types and species of cereals and cereals milling companies. At least one cereals milling company, four farmers will be sampled. The questions are to be based on a sample size of 384 respondents. The sampling was done using the Cochran's sample size formula.

3.5 Data Collection Instruments and procedures

Primary data was collected using structured and open ended questionnaire. Informal interviews was also used to capture in depth information. In the structured questionnaire the questions; the warding and sequence were fixed and identical for all respondents. This made it possible for comparison to be made between the sets of data. After each question respondents were given a chance to freely comment on the reason why they chose a particular answer so as to elaborate and give information on the answer chosen. The study used open ended questions to supplement information from structured questionnaire which at times conceal information and prevent possibilities of gaining insight into the research problem. This was due to the fact that the respondents were compelled to answer questions according to the use and adoption of modern warehousing facilities for storing cereals, availabilities and the frequency of using these facilities in the cereals growing zone and the role of the ministry of Agriculture towards the adoption of these modern warehousing facilities. The data was collected by the researcher himself with the assistance of the warehousing employees as well who gave out some questionnaires to farmers that they are accessible to.

3.6 Data Analysis

The data collected was processed and analyzed to facilitate answering the research objectives and questions. Both the quantitative and qualitative data analysis methods were used in handling information from open ended questions after which the interpretation of the findings

was used in the report writing. Quantitative data was edited, coded and entered to the Statistical Package for Social Science (SPSS) version is for withdraws and cleaned for analysis. SPSS was employed in descriptive and inferential statistical analysis.

Descriptive analysis including frequencies was used to summarize and organize data. Descriptive statistics was used to analyze the level of and proportion of farmers to be trained to use the modern warehousing facilities on the cereals growing zones. Specifically it was used to find the percentage of the respondents who had been trained on using modern warehousing facilities, those who were willing to be trained and those who had been trained on using modern warehousing facilities. Those who were willing to train and those who thought that adoption of modern warehousing was important. The respondent's opinion on the factors affecting the adoption of modern preservatives for farmers and cereals milling companies were also to be summarized and analyzed using the descriptive statistics.

The role of the Ministry of Agriculture in the adoption of modern warehousing for cereals was analyzed by companying what they were expected to do as stated in the Ministry of Agriculture policy; with the activities reported by the respondents to had been taking place in the zones, these activities would include ensuring that modernization in preservation of cereals is encouraged and facilities were sourced.

The inferential statistics was tested using the Chi square. Moreover Chi square was used to compare the frequency of case found in one variable. It was preferred when dealing with variable that would had been categorized to find whether the variables were related. After qualitative and quantitative data analysis, the results were synchronized, interpreted and discussed to answer the research questions and address the objectives of the study.

CHAPTER FOUR: DATA ANALYSIS

4.1 Introduction

This chapter presents the research results and discussions of the same. The chapter discusses further the research findings. The chapter begins with the presentation of the results on the general satisfaction and dissatisfaction of both the small scale and large scale farmers with the warehousing facilities, the extent to which they are used by the farmers, the availability of the modern warehouses to farmers. It then embarks on discussion of the results. The discussion focuses on the objectives of the study which include the extent of the usage of modern warehousing facilities in Turbo sub counties and the factors that affect both small scale and large scale farmers adopting modern warehousing facilities in Turbo.

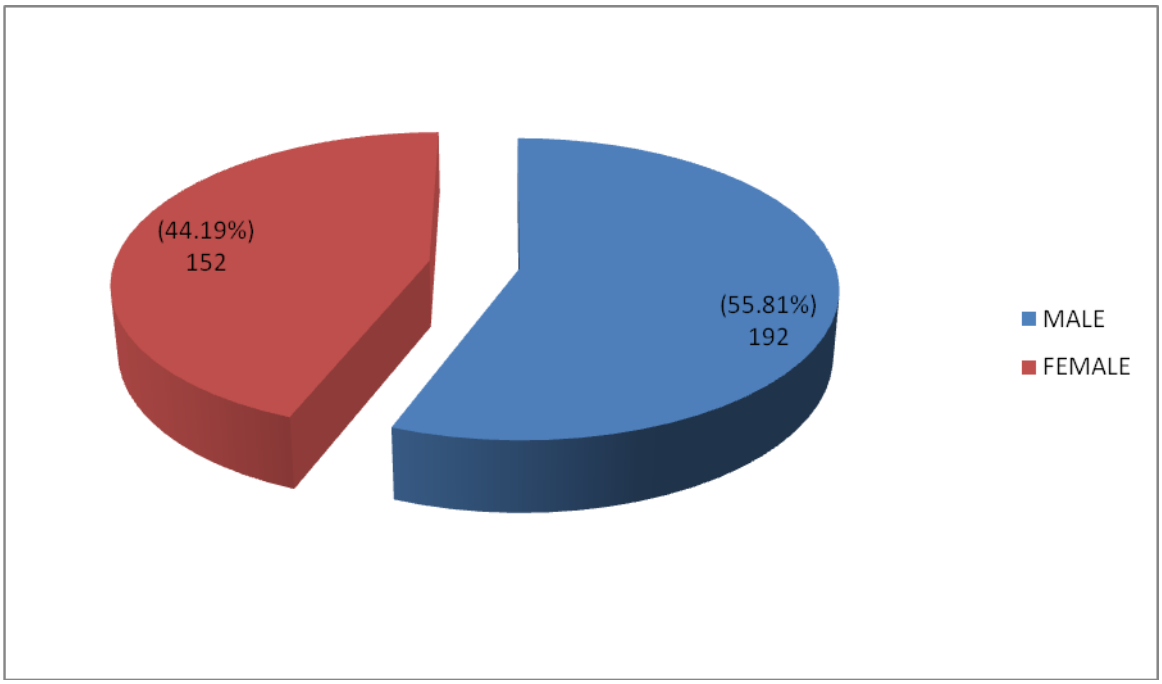
4.2 Results

This section presents the characteristics of the modern warehouses and the farmers who were respondents, their age, gender etc. such a profile is important in providing the basis for clear understanding of the circumstances under which the respondents were operating from. The research went further to explore the satisfaction of the customers that had been using at least a modern warehouse and presented the findings as shown in figure 4.6 below.

4.3 Demographic characteristics of respondents

This section present the demographic characteristics of the respondents involved in the study. The researcher chose to study the gender, the age of the respondents and the level of education of the respondents. The researcher focused on the demographic characteristics because of their importance in explaining the respondents' ability to adopt the usage of modern warehousing facilities. Figure 4.1 shows the gender distribution of the respondents

Figure 4.1: Gender of respondents

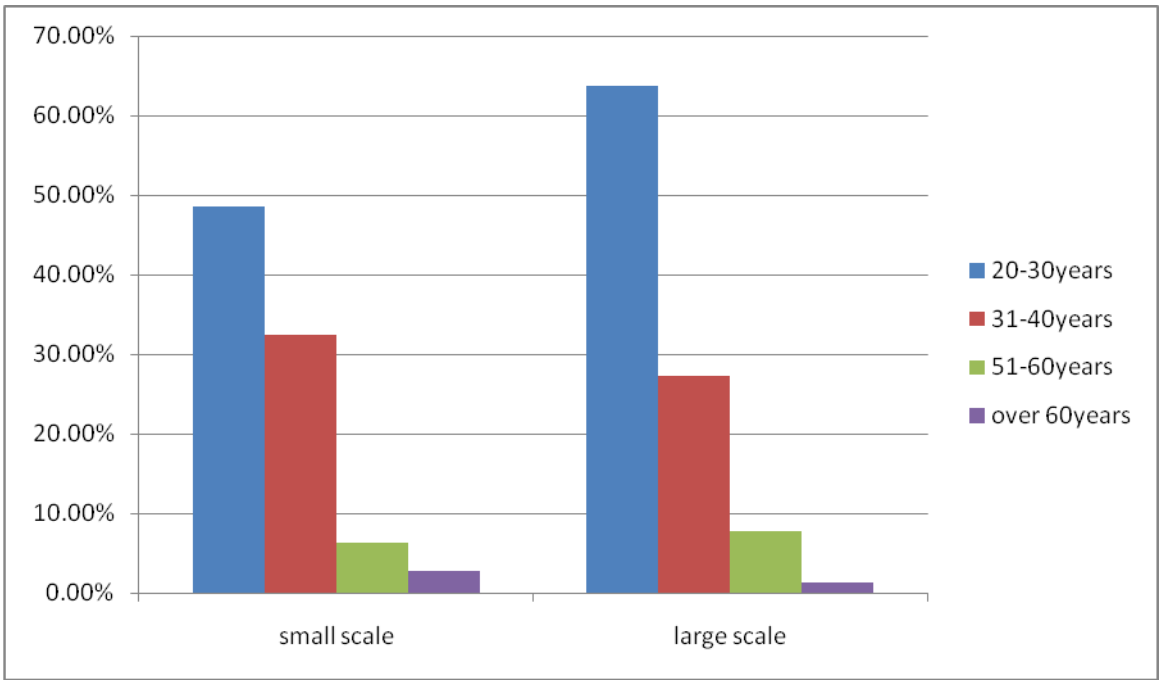


Source: Researcher, 2013

From the findings presented in figure 4.1, 192 (55.81) respondents were male while the other 152 (44.191) were female. These results show that the study involved the views of both the male and female farmers and was therefore not biased on the views of one gender.

The researcher also explored the age distribution of the respondents and presented the findings as shown in Figure 4.2

Figure 4.2: Age of respondents

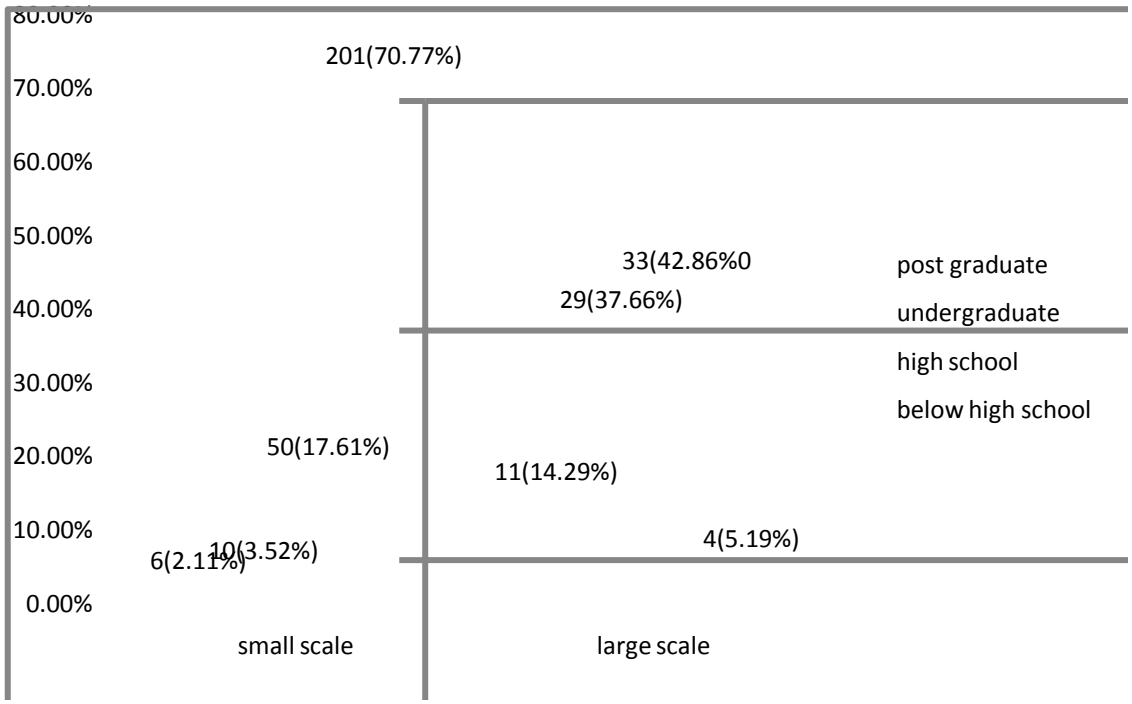


Source: Researcher, 2013

From the findings presented in Figure 4.2, out of the 284 small scale farmers who responded to the study. 136 (47.88%) who responded to the study were aged between 20-30 years, 94(30.10%) were aged between 31 and 40 years, 28 (9.86) were aged between 41 and 50 years, 18 (6.34%) were aged between 51 and 60 years and lastly 8 (2.82%) were over 60 years of age. In the category of large scale farmers 20 (25.98%) between 31 and 40 years, 18 (23.38%) were aged between 41 and 50 years and 1 (1.3%) was in the age bracket of 51 and 60 years.

A person's level of education would be important in knowing the level of understanding of a person's and consequently the person's ability to understand and adapt a new system such as the modern warehousing facilities for farmers. The researcher also explored the level of education of the respondents and presented the findings as shown in Figure 4.3.

Figure 4.3: Level of education

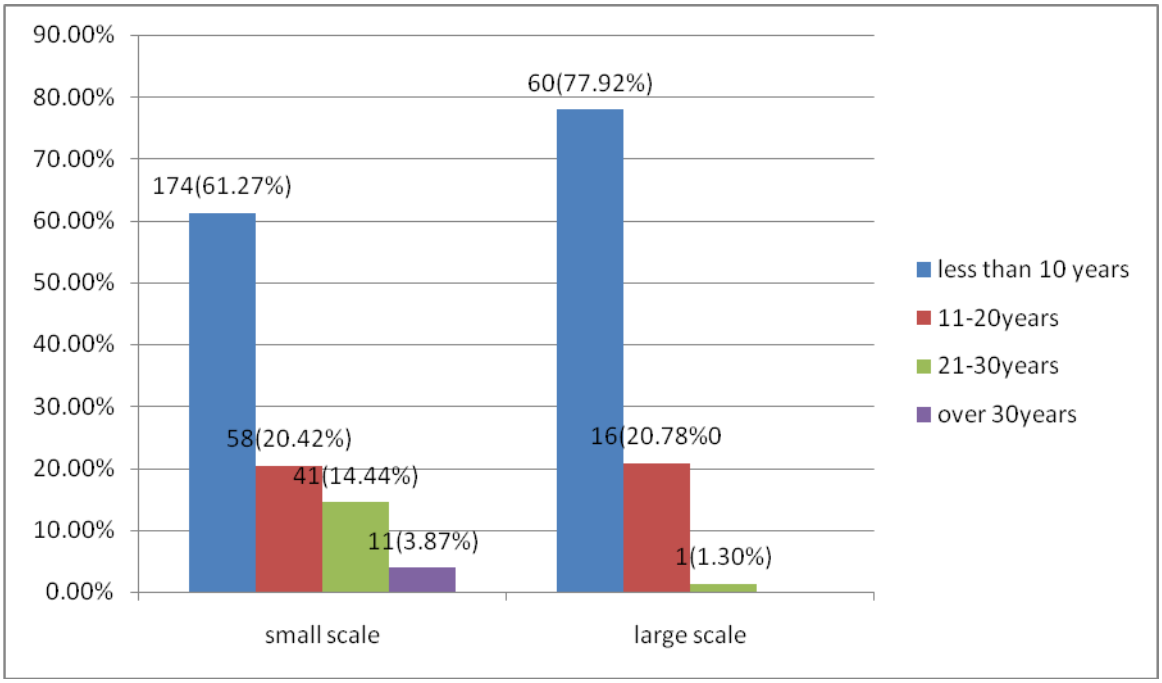


Source: Researcher, 2013

From the figure 4.3, among the 284 small scale farmers, 6 (2.11%) had postgraduate degree qualifications, 10 (3.52%) had undergraduate degree qualifications, 50 (17.61%) had high school level of education and 201 (70.77%) had not gone beyond high school wile 17 (5.99%) had not attained education at all. In the case of large scale farmers, 11(14.29%) had post graduate qualifications, 29(37.66%) had undergraduate degree level of education, 33 (42.86%) had attained a high schools certificate while 4 (5.19%) had levels of education that were below high school. From these findings most respondents had some formal education meaning they could read and understand. This means that they could easily understand the benefit of warehousing and adopt it easily.

The study went further and explored the years that the respondents had been warehousing and presented the findings as shown in Figure 4.4 below.

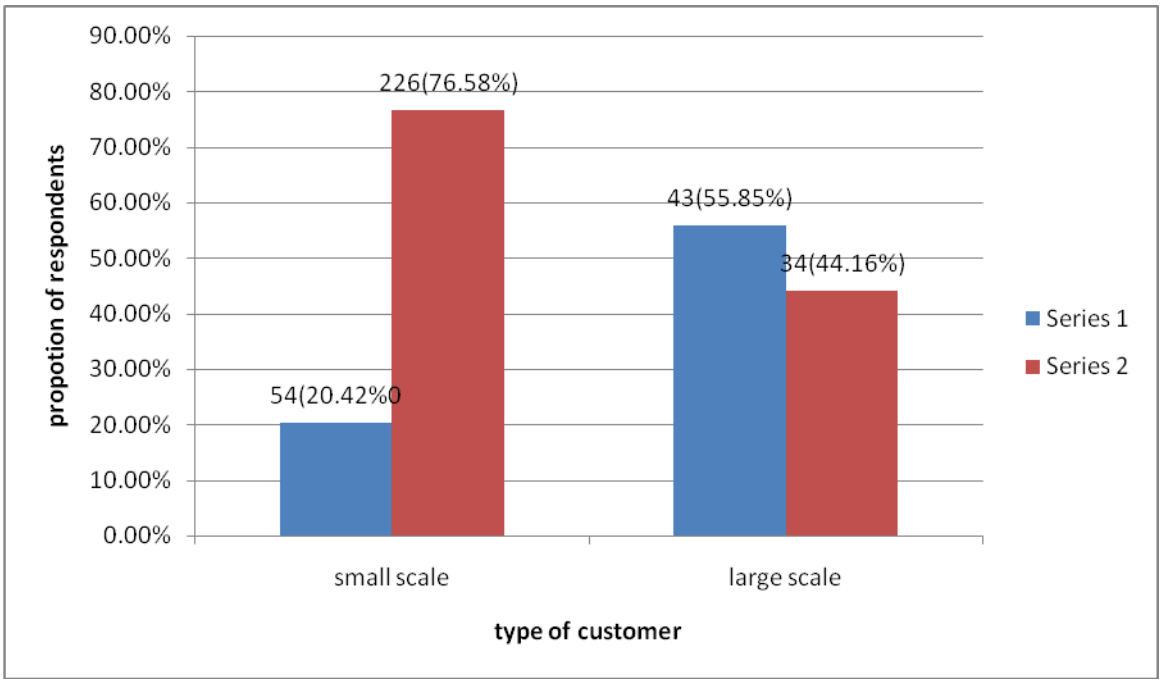
Figure 4.4: Number of years as customer



Source: Researcher, 2013

The study found that most respondents who were small scale farmers had been warehouse customers for less than 10 years. In the category of respondents who were small scale farmers 174 (61.27%) had been warehouse customers between 11 and 20 years, 41 (14.44%) respondents had been warehouse customers for a period of between 21 and 30 years and lastly 11 (3.87%) had been warehouse customers for a period greater than 30 years. In the category of respondents Who were large farmers, 60 (77.927%) had been warehouse customers for less than 10 years, 16(20.78%) had been customers of warehouse for a period ranging between 11 and 20 years and lastly 1(1.30%) warehouse customer had been a customer for a period ranging between 21 and 30 years, from these long enough to give reliable responses for the study.

Figure 4.5: Adoption of usage of modern warehouses



Source: Researcher, 2013

From Figure 4.5, 226 (79.58%) small scale farmers had adopted atleast one of the modern type of warehouses while 58(20.42%) had never used any of the modern warehouses. In the case of the large scale cereal farmers 43(55.84%) had adopted none of the two type of modern warehouses while 35(444.16%) had adopted at least one of them. These findings bring forth an interesting fact that there is a higher adoption of the modern warehouses usage among the small scale cereal farmers than among the large scale cereals farmers. This is possibly because of the fact that most large scale cereals farmers usually own their own milling factories and therefore they often prefer to take their firm produce directly to the millings. On the other hand most small scale cereal farmers are located far from the milling factories and for this reason would prefer to take their cereals to the warehouses due to its convenience as it doesn't require one to transport direct to the mills.

The researcher went further an examined the opinion of the respondents on the availability of the modern warehouses. Beliefs that the systems are available can be a printer to the ability of the cereal farmers adopting the usage while the opinion that the warehouses are poorly available to customers can be an indicator to low adoption of its usage. The researcher asked the respondents the extent to which the modern warehouses were available to them.

4.4 The extent of adoption of usage of modern warehouse among the farmers.

The first objective of the study investigated the extent of adoption of the modern warehouse usage among farmers, the researcher examined the opinion of the respondents on the availability of modern warehousing facilities, beliefs that the systems are available can be a pointer to the ability of the customers adopting the usage of the facilities while the opinion that the systems are poorly available to customers(farmers) can be an indicator to low adoption of usage of modern warehousing facilities .The researcher asked the respondents the extent to which the modern warehouse were available to them. The respondents were to respond as very low, medium, high or very high, very low a score of 1.

Low was given a score of 2, medium had a score of 3,high had a score of 4 and very high had a score of 5.The scores were summed up and divided by the total number of respondents to give a mean score less than 1.5 meant that the respondents were of the opinions that there were every low availability of the warehouse facilities, a mean score ranging between 1.5 and 2.5 means that the availability of the modern warehouse was medium , am mean score ranging between 3.5 and 4.5 meant that the respondent were of hype opinion that the availability of the modern warehouse facilities was high and lastly a mean score greater than 4.5 meant that the availability of the modern warehouse facilities was very high, Table 4.2 shows the results of the findings.

Table 4.2: Availability of modern warehouse facilities

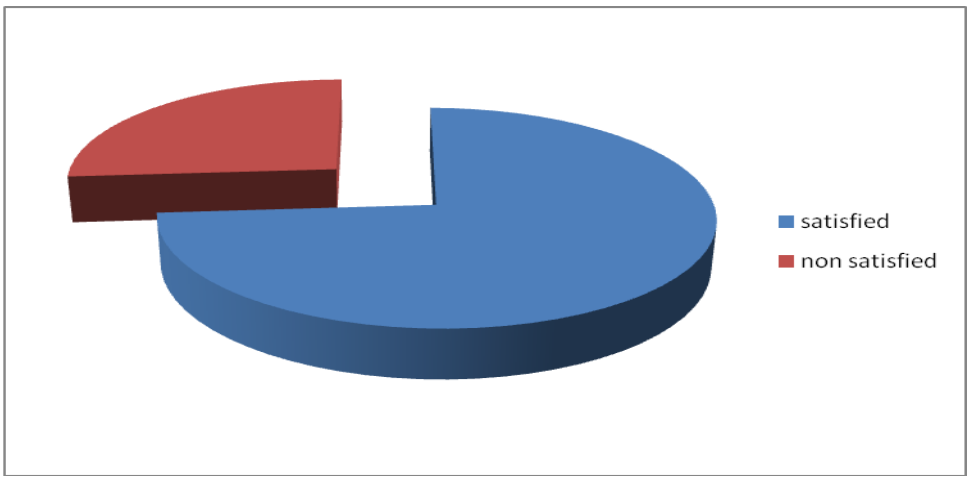
Type of users	Very low		low	medium	high	Very high	Mean score
Small scale farmers	Freq	86	21	91	45	40	2.76
	%	30.39	7.42	32.16	15.9	14.13	2.07
Large scale farmers	freq	36	21	8	4	9	
	%	46.75	27.27	9.09	5.19	11.69	
Total sample	freq	122	42	99	49	49	
	%	33.8	11.63	27.42	13.57		

Source: Researcher, 2013

Most small scale farmers were of the Opinion that the modern warehouse facilities were available to a medium extent .A total of 91 (32.161%) small scale farmers in the study said that the modern warehousing facilities were available to a medium extent for the respond of small scale farmers was 2.76 this means that an average small scale farmers who responded belief that the modern warehousing were available to medium extent.

In the case of large scale farmers, most respondents were of the opinion that the modern warehousing facilities were available to every low extent. Majority of the large scale farmer, totaling to 36 (46.75%) Large scale farmers in the study said that the modern ware housing facilities were available to a very low extent. The mean score for the respondent of average the large scale farmers in the study believed that the modern warehousing facilities were available to also extent. For the joint sample most respondent believed that the modern warehousing facilities were available to a very low extent. Totaling of 122 (33.8%) respondent in the study said that the modern warehousing facilities were available to a low extent. The mean score for the availability of modern warehousing was 2.614. This means that on average the respondent believed that the modern warehousing facilities were available to a medium extent. This could possibly give the large explanation as to why there was a higher adoption of the usage of modern warehousing facilities among the small scale farmers than it was the large scale farmers as presented in Figure 4.6.

Figure 4.6: Satisfaction with the modern warehousing system



Source: Researcher, 2013

The researcher found that most of the respondents that had been using modern warehouses were satisfied with it. Out of the 260 respondents that had been using modern warehouse, 192 (73.85) were satisfied with the system and 68(26.15) not were satisfied with the system. The researcher explored the reason that led to dissatisfaction and presented the findings in Table 4.9

Table 4.3: Reason for satisfaction with the modern warehouse.

Reason	Frequency	Percentage
Convenient to use because it saves time, materials and space	155	84.70
Satisfied because the transportation is convenient and efficient	10	5.46
Satisfied because it easers consolidation	7	3.83
Satisfied because it is economical	5	2.73
It is very reliable	4	2.19
It is very affordable	2	1.09

Source: Researcher, 2013

It emerged that the main reason why the warehousing customers were satisfied with the warehousing usage was because it saved time and materials/ space. Unlike the traditional method of staring cereals where the cereals were explored to weevils and look a lot of time arranging manually, modern warehousing was convenient because there was not time wasted because most of the loading and offloading was done by the machines such as the cranes. A total of 155 (84.70%) respondents preferred the warehousing because of the above reason. The other reason why the respondents preferred this method was because the transportation is efficient and convenient. A total of 10 (5.46%) respondents said that the process is efficient and convenient and for this reason they were satisfied with the modern system. It was also reported by 7 (3.83%) respondents, who stored their cereals in the modern warehouses that they preferred it because it eases consolidation of the farming produce making it convenient to use the system. A total of 5 (2.73%) respondents said that the system was quite economical leading to customer satisfaction. A total of 4 (2.19) respondents said that the system was more reliable leading to customer satisfaction. Thus respondents retorted that the system was very affordable contributing to their satisfaction with the system.

The researcher also looked into the reasons as to why dissatisfied respondents were actually dissatisfied with the modern warehousing systems and presented the findings in Table 4.10

Table 4.4: Reason for dissatisfaction with the modern warehousing

Reason	Frequency	Percentage
Not satisfied because if you store your cereals it is affected by pilferage and you may not get what you stored exactly.	32	52.45
Not satisfied because there is very little education of the benefits of modern warehousing provided by the Ministry of Agriculture.	11	16.03
At times it is very expensive to keep on storing in modern warehousing facilities	9	14.75
Some as the weighing machines are not accurate.	4	6.56
Not satisfied with the education level of the employees in modern warehouses	3	4.92
Network failure leads to delays in transaction	2	3.27

Source: Researcher, 2013

The main reason why the users of warehouses were dissatisfied with the warehousing services was that if you store cereals it is affected by pilferage and you may not get what you stored exactly. This was a view shared by a total of 32 (52.45%) respondents. A total of 11 (16.03%) respondents said that they were dissatisfied with the warehousing services because there is very little education about the benefits of modern warehousing. Views of 9 (14.75%) respondents bore the finding that it is very expensive to keep on storing in modern warehouses and this led them being dissatisfied with the warehousing services. A total of 4 (6.56%) respondents said that some of the weighing machines in the warehouses are not accurate fueling dissatisfaction with the system. Three respondents (4.92%) said that they were not satisfied with the educational levels of warehousing employees while two respondents (3.27%) said that network failure sometimes lead to delays in initiating transactions hence causing dissatisfaction.

4.5 Factors that affect the warehousing customers adopting the usage of modern warehouses

The second objective of the study examined the factors that affect warehousing customers adopting the usage of modern warehouses. The researcher examined several factors for their possible factors were amount of annual usage, extent of usage, ease of usage, among others. The researcher explored these factors using cross tabulations with adoption of the usage of warehouses. Table 4.5 shows the effect of average annual adoption of the usage of modern warehousing.

Table 4.5: The effect of yearly bill of adoption of modern warehousing

Average annual bill	**Adoption of warehousing usage**				**Total**	
	Not adopted		**Adopted**			
	Freq	**%**	**Freq**	**%**	**Freq**	**%**
Less than 2000shs	82	81.19	147	56.54	229	63.43
Between 2000-5000shs	14	13.86	62	23.85	76	21.05
5000shs-10,000sh	5	4.95	22	8.46	27	7.48
Over 10,000shs	0	0	29	11.15	29	8.03
Total	**101**	**100**	**260**	**100**	**361**	**100**

Source: Researcher, 2013

From Table 4.11, among the 101 respondents that had not adopted the usage of modern warehouses, 82 (81.19%) had an average yearly bill of an amount less than 2000 shillings, 14 (13.86%) respondents had a yearly bill ranging between 2000 and 5000 shillings and 5 (4.95%) had an average yearly bill ranging between 5000 and 10000 shillings. Among the 260 respondents that had adopted the usage of modern warehouses 147 (56.54%) had an average annual bill less than 2000 shillings a year, 62 (23.85%) respondents had an average annual ranging between 2000 and 5000 shillings, 22 (8.46%) had an average annual bill ranging between 5000 and 10000 shillings and lastly 29 (11.15%) had an average annual bill of over 10,000 shillings. This results show that higher amount of average annual bill was associated with adoption of modern warehousing facilities. It is also evident that there were a higher proportion of respondents that had the lowest average annual bill of less than 2000 compared to those who had adopted the modern warehouse usage.

Table 4.6: The effect of experience in using other storage methods for cereals

My experience in using other storage methods	Not adopted Frequency	%	Adopted Frequency	%	Total Frequency	%
Disagree	27	26.73	62		23.85	24.65
Undecided	41	40.59	21		8.08	17.17
Agree	33	32.67	177		68.08	58.17
Total	**101**	**100**	**260**		**100**	**100**

Source: Researcher, 2013

From table 4.12 among the 101 respondents that had not adopted any modern warehousing usage 27 (26.73%) respondents disagreed that their experience in using other storage methods was easier and convenient, 41 (40.59%) respondents were undecided on whether their experience in using other storage methods was convenient and lastly 33 (32.67%) respondents agreed that their experience in other storage methods was easier. Among the 260 respondents that had adopted the usage of modern warehouses 62 (23.85%) respondents disagreed that that their experience in using other storage methods was easier, 21 (8.8%) respondents were undecided on whether their experience in using other storage methods was easier and lastly 177 (80%) respondents agreed that their experience in using other storage methods was easier. These findings are an indication that experience in using other storage method was associated with adoption of modern warehousing facilities and vice versa.

The researcher further examined the attitude of the respondents towards the usage of modern warehousing facilities towards the usage of modern warehousing facilities on adoption. The attitude was captured using the opinion of the respondents on whether the modern warehousing was a good idea.

Table 4.7: Shows the cross tabulation between attitude and adoption of the modern warehouses

Using warehousing is a good idea	Not adopted the usage		Adopted the usage		Total	
	Freq	%	Freq	%	Freq	%
Disagree	10	9.90	32	12.31	42	11.61
Undecided	40	39.60	11	4.23	51	14.17
Agree	50	49.50	217	83.46	267	74.11
Total	**100**	**100**	**260**	**100**	**360**	**100**

Source: Researcher, 2013

From Table 4.13 among the 100 respondents that had not adopted usage of warehouses, 10 (9.9.%) respondents disagreed that using the warehouse was a good idea, 40 (39.60%) respondents were undecided on whether using warehouses was a good and lastly 50 (49.50%) respondents agreed using warehouse was a good idea. Among the 260 respondents that had said warehousing was a good idea, 11 (4.23%) respondents disagreed that warehousing was a good 217 (83.46%) respondents agreed that warehousing was a good idea. From the findings of the warehousing adoption was associated more with a customer believing that using warehouses was a good idea.

The researcher also explored the effects of the customers perception on the usefulness of the warehouses was captured using a question asking the respondents to state whether they agreed that warehousing system improved their performance in their operations. Table 4.14 shows the cross tabulations between perceived usefulness of the warehousing usage and adoption by the customers.

Table 4.8: The effect of the perceived usefulness of the warehouses

Using modern warehouses	Not adopted		Adopted		Total	
Improves performance	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
Disagree	12	11.88	30	11.54	42	11.63
Undecided	62	61.39	29	11.15	90	24.93
Agree	27	26.73	201	77.70	229	63.43
Total	**101**	**100**	**260**	**100**	**361**	**100**

Source: Researcher, 2013

From Table 4.14, among the 101 respondents that had not adopted usage of modern warehousing systems 12 (11.88%) respondents disagreed that using modern warehouse improves their performance, 62 (61.39%) respondents were undecided on whether using modern warehouses improved their performance and lastly 27 (26.73%) respondents agreed that using modern warehouses improved their performances. Among the 260 respondents that had adopted the modern warehousing, 30 (11.54%) respondents disagreed that using modern warehousing facilities improved their performance 29 (11.15%) respondents were undecided on whether using modern warehouse improved their performance and lastly 201 (77.70%) respondents agreed that using modern warehouses improved their performance, from these findings it is clear that belief by the farmers that modern warehousing improve their performance was associated more with adoption of the modern storage system.

4.6 The effect of age of the adoption of the usage of modern warehouses

The adoption of modern warehouses was captured using the extent to which the respondents adopted the particular warehousing facility namely; the private warehouses, the public warehouses and bonded warehouses. The respondents responded that they adopted these facilities as either to very large extent, to a large extent, to a small extent to a very extent or not at all. The responses were scored as follows, not at all was given a score of 1, very small extent was given a score of 2, small extent was given a score of 3, large extent was given a score of 4 and very large was given a score of 5. For each respondent their score responses were summed up to give available representing the level of adoption of modern warehousing facilities, this variable ranged between 6 and 30. The value 6 meant that the particular respondents had the least level of adoption of modern warehousing particular respondents had the highest level of adoption of the modern warehousing facilities, if the respondents had adopted the modern warehousing system to the highest extend.

The researcher examined the level of adoption of modern warehousing as categorized by age and level of education.

The Table 4.9 shows the results of the findings.

Table 4.9: The effect of age on adoption of modern warehousing

Age	No of respondents	Average level of adoption of modern warehousing usage	Standard deviation
20-30	177	12.186	6.503
31-40	110	14.272	6.423
41-50	33	16.396	7.008
51-60	17	14.117	5.786
Over 60	8	11.000	2.828

Source: Researcher, 2013

From table 4.9 average level of adoption of modern warehousing usage was lowest for the respondents aged above 60 years, with an average level of adoption of 11.000. This was possible due to their slowness to embrace new and modern technology as result of their age. The age bracket between 20 and 30 years was the second least in adoption warehousing usage with the adoption level of 14.272. This was possibly due to the fact that this age bracket is energetic and can do great family and hence able to make good harvest. Adoption of the modern warehousing usage increases in the age bracket in the range between 31 and 40 years, to a level of 14.272. Adoption further goes higher to 16.393 in the age category of 41 and 50 years. This increase is observed possibly because of the fact that this age group is usually occupationally very busy and is more likely to adopt modern warehousing usage so as to safe their harvest. Adoption of modern warehousing may also be higher in these age bracket because this age bracket is informed and can easily embrace new technology. Adoption of modern warehousing however goes down in the age bracket between 51 and 60 years. The standards deviation for the age average level of adoption for the different age brackets was relatively small values meaning that the mean score explains a higher proportion of the data.

The study also explored the influence of level of education usage of modern warehousing and presented the findings in the Table 4.10

Table 4.10: Effect of education on usage of modern warehousing

Level of education	Number of respondents	Average level of adoption of modern warehouse usage	Standard deviation
Post graduate degree	42	14.166	6.41
Undergraduate degree	159	14.93	6.488
High school	129	12.29	6.488
Below high school	15	8.06	5.188

Source: Researcher, 2013

From Table 4.10 average level of usage of modern warehouses was lowest for the respondent who has an education level below high school. However, it is noteworthy that the respondents in this category were also very few, with an average level of adoption of 8.06. This was possibly due to slowness to embrace new development as a result of their lack of exposure. The respondents with undergraduate degrees, who were also the majority, had the highest level of usage at 14.93.

From this, it is evident that warehousing owners need to intensify awareness and encouragement of the farmers who are their customers with less exposure for them to adopt the usage of modern warehouse.

Table 4.11: Correlation between factors influencing modern warehouse usage and its adoption

Variable	Correlation coefficient with the adoption of the usage of the modern warehouse	P. value
Age	0.207	.000
Level of education	0.239	.000
Issues related to modern warehouse usage are evident	0.152	.005
My experience with modern warehouse usage	0.230	.000
Using modern warehouse is a good idea	0.302	.000
Using modern warehouse improves performance	0.387	.000
The decision to support modern warehouse is to improve customer service	0.441	.000

Source: Researcher, 2013

All the variables were positively correlated with the level of the adoption of the warehouse usage. From the positive correlation, it implies that there was a positive relationship between the variables and the level of adoption of the warehouse usage. The P value significance were values less than 0.05 meaning that it was not due to chance that these positive correlation existed but the relationship was indeed statistically significant at 5% level of significance.

CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introductions

This chapter presents a summary of the research findings and gives the conclusions of the research findings. This chapter further gives recommendation based on the research findings and lastly it gives suggestion for further study.

5.2 Summary

This section presents a summary of the research findings as captured from the analysis of the objectives.

The first objective of the study investigated the extent of the adoption of the usage of modern warehouses by the cereal farmers. There are two types of modern warehouses available to cereal farmers in Turbo East and Turbo West. They include the public warehouses and private warehouses. From these findings 226 (76.58%) small scale cereal farmers had adopted atleast one of the services of the warehouses while 58 (20.42%) had never used any of the warehouses found in Turbo sub counties. In the case of the large scale cereal farmers in Turbo, 43 (55.84%) had adopted none of the two types of warehouses while 34 (44.61%) had adopted at least one of them.

The second objectives of the study investigate the factors that affect the small scale and large scale farmers adopting the usage of modern warehousing facilities. The study found that the factors were previous experience in using the other storage methods, positive attitude towards the modern warehouse usage and the cereals farmers towards the modern warehouse is more efficient and convenient and it improves performance.

5.3 Conclusion

The purpose of the study was to investigate the factors that influence the usage of modern warehousing facilities by the cereal farmers in Turbo East and West sub counties. The study found that (79.58%) small scale farmers had adopted atleast the usage of one of the modern type of warehouse. In the case of the large scale cereal farmers (55.84%) had adopted none of the types of modern warehouses while (44.16%) had adopted atleast one of them.

5.4 Limitation of the study

The study was limited by adequacy of financial and human resources. The researcher had limited resources which made her involve a few assistants for the study. This was however

taken care of by having the assistants working extra to compensate for the little financial resources.

The other limitation was with respect to time. The researcher had very limited time to collect date arising to the fact that the researcher works in organization that work seven days a week. The researcher therefore had to involve the assistance of the warehousing management to help in identify same of the respondents.

The other limitation was with respect to administration and collection of the questionnaire. Some of the respondents were unable to fill in the questionnaire in time thus prompting more visits.

Due to this study was unable to get all the respondents. However the study was able to get more than 75% respondents which Cooper and Schindler (2000) state as the threshold for nay social research to continue.

The other limitation was that most farmers in Turbo were illiterate and this made it impossible to communicate in the official or national languages some could not even unite properly prompting the researcher to seek for interpretation from a person who could easily understand.

5.5 Recommendations

The study recommended that the management of modern warehousing facilities should ensure that the high bills charged should be reduced so that small scale farmers can get opportunity to store their cereals in the warehouses.

The study recommends that there should be initiatives to build more modern warehousing facilities in Turbo which are close to the cereal farmers. This will see to it that majority of these cereal farmers are encourage to store their produce in the stores. The facilities should also be spacious and large enough to accommodate bulky produce.

The study recommends that the public warehouses should offer incentives for adoption of the usage of the modern warehouses so as to encourage farmers to adopt the usage of the facilities. Such incentives can be in the farm of the earning points for promotions depending on the frequency and volume of your cereals, discounts on the bills or allocation of free space for temporary storage of the farm produce for farmers who consistently use the warehouses. There should also be the loans offered to the cereal farmers so as to encourage them.

The government is also a major player in fight against poverty through its various arms. These arms of government include the ministry of Education, the ministry of Agriculture and parliament. These various arms have different functions in relations to the fights against poverty eradication and it is impossible to successfully establish modern warehousing facilities without their support. It is necessary to conduct a study to establish the role and capacity of the different arms of the government in resolving warehousing related problems to determine whether these roles supplement each other.

5.6 Suggestions for further study

The study suggests that the same study should be conducted in future to assess whether there is improvement in the adoption of the usage of the modern warehouses among the cereal farmers in Turbo East and West. The study also suggest that a similar study needs to be done in different agricultural regions that produce other farm crops such as sugar cane, coffee etc. so as to compare the extent of the adoption of the usage of modern warehousing facilities in different area in Kenya and whether the factors influencing the adoption in those areas are similar or divergent.

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APPENDICES

APPENDIX 1: ACRONYMS AND ABBREVIATIONS

AFC – Agricultural Finance Association

KCC – Kenya Co-operative Creameries

KFA – Kenya Farmers Association

KGGCU – Kenya Grain Growers Co-operative Union

KPCU – Kenya Planters Co-operative Union

NGO – Non-Government Organization

SPSS – Scientific Packages of Social Sciences

APPENDIX 2: RESEARCH WORK PLAN

ACTIVITY	DATE
Sharpening focus on stays and research design	May 2013
Review of related literature	May 2013
	June 2013
First proposal draft	June 2013
Review of proposal 2nd draft	July 2013
Final draft and submission to department and school	August 2013
Proposal defence	September 2013
Field work	October 2013
Data analysis	October 2013
Thesis writing and typing	October 2013
Submission of thesis for examination	October 2013
Correction and submission of final project	October 2013

APPENDIX 3: BUDGET ESTIMATES

ACTIVITY	QUANTITY	UNIT COST (KSHS)	TOTAL COST (KSHS)
Researchers travel			
Allowance	30days	100	3000
Subsistence			
Allowance	30days	1000	30000
Accommodation	15days	700	10500
Stationery			
Field note books	5	60	300
Documents holder	3	50	150
Foolscap	3reams	400	1,200
Typing papers	2reams	400	800
Tape recorder	1	2000	2000
Empty tapes	5	100	500
Ball pens	20	20	400
Secretarial work			
Typing proposal	l50 pages	50	2500
Photocopying Proposal	250 pages	2	500
Typing thesis	100pages	40	4,000
Reprographic Services			
Photocopying thesis	400pages	5	2,000
Binding thesis	4copies	100	400
Data processing			4000
Sub-total			62250
Contingency (About 10% of the total Cost)			6225
GRAND TOTAL			**68475**

APPENDIX 4: QUESTIONNAIRE

This survey is designed to understand warehousing to customers (farmers), their experience and expectations of the services and the benefits.

Please give appropriate responses in the questionnaire in relation to your use of warehousing.

Section A (1) Demographics personal background information on the respondents as user of E-forum services.

1. Please specify your gender
   Male [ ] Female [ ]
2. What is your age bracket?
   20 – 30 [ ] 31 – 40 [ ]41 – 50 [ ] 51 – 60 [ ] over 60 [ ]
3. Education: State your highest level of education.
   Post Graduate Degree [ ] Undergraduate degree [ ] High school [ ] Below High school [ ]

Section A (2) Demographics- Warehousing customers

In this section, you are expected to respond to the following

4. For how long have you been storing farm produce in warehouses?
   0-10 years [ ] 11-20 [ ] 21 -30 [ ] over 30 [ ]
5. Please specify the availability of the warehouses
   Very low [ ] low [ ] medium [ ] high [ ] very high [ ]
6. Please state which customer you are
   Domestic customer [ ] Commercial Customer [ ] Large power customer [ ]
7. How much is your annual average storage?
8. 500 -1000kg[ ] 1000kg – 5000kg [ ] 5000kg – 10000kg[ ]
9. Please state your warehouse accessibility?
   Close to farmers [ ] far from farmers [ ] very far from farmers [ ]
10. State the farmers attitude towards usage of warehouses
    Very poor [ ] Poor [ ] Good [ ] Very Good [ ]

SECTION B

The following statements relate to the factors affecting adoption of warehousing system. Please tick in the appropriate boxes to indicate the extent to which you agree with each statement as having influenced you adoption of warehousing.

Statement	**Strongly Agree**	**Agree**	**Undecided**	**Disagree**	**Strongly Disagree**
Awareness					
Issues related to warehousing are easily evident					
Previous experience					
Experience other warehousing system services are easier					
Attitude					
Using warehousing is good idea					
Perceived usefulness					
Why warehousing improves our performance					
Subject norms					
Farmers decision adopt warehousing is to improve customer service.					

THANK YOU FOR YOUR PARTICIPATION