

**STRATEGIES USED BY LARGE SCALE GRAIN GROWERS TO
ENHANCE PRODUCTIVITY IN SOY SUB-COUNTY, UASIN GISHU
COUNTY, KENYA**

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DECLARATION

This research project is my original work and it has not been submitted for examinations in any learning institution or university.

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D61/8063/2017

This research project has been submitted for examinations with my approval as the University supervisor.

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DEDICATION

I dedicate this project to the Almighty God for His Mercy and strength He has granted me in completing this work. Secondly to my mother Josephine C. Tuyei, siblings Pius and Leonard for their continuous support.

May God Bless You Abundantly

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ABSTRACT

Agricultural sector over the last decade has played a key role in propelling the economies of countries and providing food to the growing population. Grain growing farming strategies are those unique methods that can be employed to increase the number of bags produced in the fields or in any farming system. Strategies can differ according to the location, and the choices of the farmer. It is reported that about 75% of large-scale farmer's in countries plant grains in their farms compared to 85% small scale farmers who grow mainly fast growing crops. The main objective of the study was to assess strategies used by large scale grain growers to enhance productivity in Soy Sub-County, Uasin Gishu County, Kenya. The specific objectives that aided the broad objectives are: To establish how modernized strategies influence productivity among large scale grain growers in Soy Sub-County, Uasin Gishu County, Kenya, To examine how risk management strategies influence productivity among large scale grain growers in Soy Sub-County, Uasin Gishu County, Kenya, To assess how support strategies influence productivity among large scale grain growers in Soy Sub-County, Uasin Gishu County, Kenya. The study was guided by the diffusion of innovation theory. The systems theory descriptive survey research design to be a method in which detailed information is obtained from a target group using structured questions or forms. The target population of the study was 158 large scale grain growers farmers found in Soy sub-county in Uasin Gishu County. The study employed simple random sampling technique to obtain the sample size of 113 from the target population of 158. Simple random sampling technique provided a simple method in which representatives were chosen from the entire population without any biasness. The research used structured questionnaires to collect data. The coded data was then be analyzed using descriptive statistics with open ended questions analyzed qualitatively. The study found that majority of the grain growers are using modernized strategies in their farms to enhance productivity, use of certified seeds have increased the number of bags produced, and farm mechanization has increased the number of yield per hectare. This study further found that risk management strategies are employed in farms, crop insurance is important in enhancing productivity in the farms. Extension services support have increased more yield per hectare, and credit facilities are important in enhancing productivity in the farms. In general there are certain farming strategies that are employed by large scale farmers that help them enhance productivity in their farms.

ABBREVIATIONS & ACRONYMS

DRMA	Drought Risk Management Authority
FAO	Food
NCPB	National Cereal and produce Board
NCCAPA	National Climate Change Action Plan Authority
SPSS	Statistical Package for Social Sciences

CHAPTER ONE: INTRODUCTION

1.1. Background to the study

Agricultural sector over the last decade has played a key role in propelling the economies of countries and providing food to the growing population. Countries have focused on food security initiatives due to the rapid changes in the environment this is by developing suitable strategies that help to sustain food production. Chamber (1988) states that grain growing is part of those food production policies implemented by countries to manage the increasing population size. Examples of grains that are grown include: maize, beans, wheat, millet, rice, sorghum, and oats. Despite challenges of diminishing land sizes, urbanization and industrialization a number of farmers prefer grain growing due to its storage ability, fewer risks and high demand for its consumption. It is reported that about 75% of large-scale farmer's in countries plant grains in their farms compared to 85% small scale farmers who grow mainly fast-growing crops (Chamber, 1988).

In Africa, according to the Economic survey of 2001 the number of small scale farmers in Kenya growing grains is estimated to be 3.5 million which is about 75% of the total production which leaves 25% of the production done by large scale farmers. This factual figure is brought about with a number of reasons but the main one is land fragmentation due to increasing population growth. Over the years the size of the land that was meant for production process has become smaller in size leaving a small part for grain growing or crop production (Chand, Prasanna & Singh, 2011).

Debertin (2012) argues that in improving the economic welfare of its citizens several countries have propagated the need to use modernized farming technologies, and strategies in grain growing. But this have not been achieved among the farmers who are still stuck or rely heavily on traditional farming systems. This has seen the number of yields diminishing every year, and the most affected are small scale farmers in developing and undeveloped countries. It is encouraging that studies have shown that a significant number of large-scale farmers have embraced suitable farming strategies that have helped to increase productivity and sustain their production over the years. Some of the key strategies dominant among large scale farmers include use of mechanization, use of support initiatives and risk management strategies among others.

1.1.1. Concept of grain growing farming strategies

Chand, Prasanna and Singh (2011) define strategy as a technique, method used to enhance a firm's competitive edge. In crop production or agricultural farming, it refers to the techniques that farmers are using competitively in order to increase their farm yields. Farmers can competitively identify ways in which they can improve their productivity to higher and significant levels, and in addition they can better their current practices by adopting new ways in order to face the dynamic environment. Grain growing farming strategies are those unique methods that can be employed to increase the number of bags produced in the fields or in any farming system. Strategies can differ according to the location, and the choices of the farmer. But one common factor of these strategies is that they will be able to increase the yields in which the farmer was targeting (Farrell, 1957).

Grain growing farming strategies in these studies refer to those methods, and techniques employed by farmers to improve farming systems, and increase productivity in the long run. There are a number of strategies that grain farmers can use to increase productivity in their farms. Based on the problems facing farmers the study did identify three strategies that are common with large scale farmers in which they are employed more frequently. The strategies include the use of modernized farming techniques, adopting risk management techniques, and developing a suitable framework to embrace any kind of support. The study will be seeking to establish the extent to which such strategies can be utilized to increase productivity (Chand, Prasanna & Singh, 2011).

The study used the theory of innovation diffusion and system theory to explain the relationship between grain growing farming strategies and productivity. According to the theory of innovation diffusion farmers can benefit from information or knowledge diffused to them to adopt suitable strategies that contribute to enhanced productivity in their farms. The system theory complements the theory of innovation diffusion by stating that organizations need to obtain information from external sources in order to operate like a system. Sourcing information from external sources enable the organization to make valuable decisions.

1.1.2. Concept of grain growing farming strategies and productivity

Productivity in agriculture throughout in history has been attributed on a number of aspects practiced by the farmer. The worldwide evidence shows that investments in inputs and improved production systems results to more outputs and yields. Productivity as a concept refers to the number of yields or output produced at a given time period and

within a specified size of the farm. The ability of farms to make higher investments, use of improved systems, adopt mechanization, and reduction in costs results to more productivity. Productivity is also seen as improvement of outputs if a farmer compares the previous and current productions or yields (Gorton & Davidova, 2001).

In the current study the concept of grain growing productivity refers to the level of yield or outputs produced at a given period of time and in comparison, to the farm size. Productivity becomes a major component in farming in which farmers set targets to achieve it. Successful farms in grain growing is measured on the basis in which the farmer can produce higher yields using lesser inputs. Directly in grain growing productivity is measured based on the number of bags that can be obtained from the farm. Higher number of bags produced according to grain growing farmers is seen to be the measure of success and higher profits (Gorton & Davidova, 2001).

1.1.3. Grain growing in Kenya

Since independence Kenya has been pursuing the goal of attaining self-sufficiency in major crops especially grain growing. The main focus was to have improved production in commodities like wheat, maize and rice in order to avoid over reliance on imports. In few years of 70's the self-sufficiency goal was achieved in certain grains in which surplus were even sold after meeting domestic consumption. The current situation in the country on the policy of self-sufficiency is that it has lagged behind schedule this is evidenced by some of these grains being imported from other countries in order to secure food security. One notable finding under the self-sufficiency policy is that all the country efforts was

dominantly focusing on maize production leaving behind production of other grain crops (FAO, 2011).

In Kenya, grain production is highly dominated with maize production at 32%, dry beans at 18.7%, millet at 15%, wheat at 13.8%, and sorghum at 5.9%, cowpea 4.8% and rice at 3.1% of the entire production, other grains in total account for 6.7%. The total production of grains is estimated to be 67,340,780 million bags per year. The factual findings show that in Kenya maize and beans is dominating the entire grain production (FAO, 2011).

In Soy sub-county in Uasin Gishu the 2009 census reported that majority of the large-scale farmers about 158 (76%) out of 179 come from the sub-county with more than 50 hectares of land. These farmers are reported to be growing grains more dominantly wheat, beans and maize. Few of these firms grow sorghum or millet or other types of grains. The farmers are motivated with the desire of commercializing their firms in order to capitalize profits. The National Cereal and produce Board (NCPB) reported in 2018 that about 11 million of grain bags of wheat, maize and beans all together originated from soy-sub County. It is from these statistics that the study was justified to conduct using the Soy-sub County.

1.2. Research problem

One of the economic pillars of growth in Kenya is agriculture, it is also a key aspect in poverty reduction and ensuring food security. It is reported that majority of Kenyans are depended on small scale crop production which is not sufficient to meet the ever-increasing population. Grain growing forms part of the Kenyan dietary requirements in alleviating poverty, ensuring that food is available, income in rural areas are improved,

and the economy grows significantly. A number of crops have experienced losses over the last 13 years which has resulted to a decline in Gross domestic products.

One negative response is the Kenya's decision to import a large number of grains from other countries is economic catastrophic in the long run, it worsens by bringing dependency syndrome, increases commodity prices, and slows economic growth. Grain imports have become higher in proportion than what was reported decade ago.

There are several studies that are related to the current study they include; Rutto (2015) did a study on Smallholder farmers to investigate factors that affect marketability of maize produce in Soy Sub County of Uasin Gishu, Kenya. The main finding of the study was that small holder's farmers require support services in order to market their produce. There was a relation between the study by Rutto and current study in identifying the need of support services but the gap of the study was that the author only dwelt on one factor as hindrance to productivity. Kipsang (2014) did a study on operations risk management and wheat farming productivity in Narok North constituency. The study did establish that operation risks have a negative relationship with production of wheat. The study was similar in addressing the effect of risks in wheat production but the gap is that the study only dealt with one type of grains.

Despite several initiatives by large scale farmers to increase production it is reported that grain production is declining each year. Productivity of grains have declined this is according to the National Cereal and produce Board (NCPB) report of 2018 despite several forums and interventions from several bodies. It is from this assertion that the

study will be seeking to establish the answer to the question; Do strategies employed by large scale grain growers enhance productivity?

1.3. Research objectives

The main objective of the study was to assess strategies used by large scale grain growers to enhance productivity in Soy Sub-County, Uasin Gishu County, Kenya.

The specific objectives that aided the broad objectives are:

- i. To establish how modernized strategies influence productivity among large scale grain growers in Soy Sub-County, Uasin Gishu County, Kenya.
- ii. To examine how risk management strategies influence productivity among large scale grain growers in Soy Sub-County, Uasin Gishu County, Kenya.
- iii. To assess how support strategies influence productivity among large scale grain growers in Soy Sub-County, Uasin Gishu County, Kenya.

1.4. Value of the study

The study is forecasted to be of greater benefit to several individuals and institutions this is by contributing to policy making and facilitating operations through practice. Farmers both small and large scale will benefit from the study findings by identifying a number of useful ways in which they can adopt to increase their yields or outputs. The study will be providing findings on ways to manage risks, utilize modernized techniques and adopting relevant support mechanisms which will help grain grower's farmers to change their farming systems and increase their productivity.

Several agencies that are involved with agriculture policy making will also benefit from the study findings. For example, the Government through the Ministry of Agriculture (regional and national) would use the finding to develop strategies that can help productivity of grain growing across the country. Other organizations that provide direct support to the farmers for example seed companies, fertilizer agencies and others can develop their own strategies to suit the farming needs through the study findings.

Scholars, researchers and academicians will be provided with theoretical and empirical findings from the study. Scholars and academicians will find additional knowledge related to risk management, support mechanisms, and mechanization strategies employed in agricultural production. Researchers will benefit from the study through secondary data provided by the study findings, and gaps that they can use to conduct future research.

CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

The section reviewed literature from secondary sources explaining the variables of the study. The part outlined the theoretical and conceptual framework that shows the relationship between the two study variables.

2.2. Theoretical foundation

The section reviewed two theories which are useful in explaining the variables of the study. The two theories are the theory of diffusion of innovation theory and systems theory. Both theories are used to build the theoretical foundation to the research goal to be achieved.

2.2.1. The Diffusion of Innovations Theory

The study was guided by the diffusion of innovation theory which was compounded by Rogers Everett in 2013 a professor in communication. The message behind the theory was on the features that make techniques and technologies related to innovation to be known and implemented in organizations. Strategies related to innovation especially in farming must be known in order for them to be implemented. They require to be communicated to farmers in order for them to adopt new innovative and unique ways to increase productivity. The author states that information can be transmitted using different Medias or channels to the final recipients but whatever that matters is the timing and content transmitted.

The relevancy of the theory is that farmers can obtain information various sources relate to ways of improving farm productivity. The process they obtain information helps them to adopt or embrace them in their daily operations of the farm. But according to the theory the aspect that matters is the ability of the farmers to employ the new knowledge or information and make them to be strategies (Farrell, 1957). The theory is important in the study in trying to explain the extent to which the grain farmers are using information obtained externally in order to make valuable farming decisions to increase productivity. The criticism of the diffusion is that it does not factor the contribution of external sources of information in farm strategic decision making.

2.2.2. Systems theory

The systems theory was used in the current study to compliment the weakness of the systems theory. The system theory was compounded by Ludwig Von Bertalanffy in 1930 a biologist as part of the management theories. The theory states that organizations or any kind of body consists of several parts that are integrated to make a whole. No organization operates alone it is depended on other parts to work effectively and produce the intended goals or objectives. That means that any system consists of parts in which it has borrow resources or inputs from them and share functions mutually for both to co-exist effectively (Chamber, 1988).

The theory was applied in this study to explain the relationship between the large scale grain growing farmers and the external stakeholders or parties. It means that farmers cannot exist without the support coming from external environment. Decisions and advices for farming activities come from external sources or from other stakeholders in

which the farmer is expected to embrace or adopt. The theory will be used to explain the third objective of the study in which grain farmers are expected to use support from external environment like the way a system work in order to make decisions that can be useful in increasing productivity.

2.3. Measurement of variables

The part explains the extent to which the independent and dependent variables of the study was measured. Measurement of variables is important in establishing the framework in which the literature review was to be discussed.

2.3.1. Grain growing strategies

In agricultural farming there are several strategies that grain growing farmers can use to increased productivity. The study focused on three strategies which include: use of modernized farming techniques, availability and use of risk management techniques, and lastly the extent to which the farmers are getting support from external sources. The three will be used to measure grain growing strategies. Modernized farming strategies refers to the extent to which grain farmers are using approved seed varieties in their farms, they have embraced suitable mechanization to replace the traditional methods, they employ suitable farming systems, and are using new technologies in farming (Gorton & Davidova, 2001).

Risk management strategies refer to techniques that farmers are using to cushion against foreseen and unforeseen risks facing their farms. Risk management in grain growing can be measured by establishing the extent to which farmers have risk plans formulated for their plans, farmers have transferred risks to third parties through crop insurance policies,

and the extent to which the farmers have mitigation plans to address the foreseen and unforeseen risks occurring or expected to occur in the farm. Support services in grain farming refer to any form of advice or information that the grain farmer is obtaining from other experts, agencies, firms and government that helps in their operations of the firm. Support services in grain growing farming can be measured on the basis in which farmers are using extension services, getting credit facilities or are accessing expert advisories on farming systems and methods (Chand, Prasanna & Singh, 2011).

2.3.2. Measurement of grain productivity

Based on a number of factors and variations, studies have showed that grain crops have lower profitability making them be classified as low value commodities. In comparison to other crop from horticulture like tomatoes, potatoes, studies have shown that grain profits return per shilling is lower. But is important to note that the startup costs of growing grains is lower that makes more large scale farmers to prefer growing low value grains in addition to this grain productivity in majority of sub Saharan Africa is higher compared to other crops. In the current study productivity in growing of grains in measured in a number of indicators (Farrell, 1957).

The notable measure of productivity of grain producing firms is use of number of numbers of yield produced in the firm. The yields produced for grain production is measured by the number of bags, and profits obtained after selling the yields. All the grains are measured according to the number of bags produced per hectare. There is a standard measure of bags for maize which is estimated to be an average of 60 per hectare, 20 bags for beans per hectare, rice is estimated to be 15 bags per hectare, and 35 for

wheat per hectare. If a farmer produces more than the set standards of bags then the yield was successful and translates to more profitability (Gorton & Davidova, 2001).

2.4. Empirical studies on grain growing farming modernized strategies and productivity

In farming practice and agriculture production adoption of suitable equipment's, tools, methods and inputs is known as mechanization. The use of improved systems in production process is directly linked to the mechanization process adopted. The main goal of using mechanization strategies is to improve crop productivity and reduce the costs of producing the crops. In Africa, grain growing costs is estimated to be 40 to 60% of the final retail price of the output. Reduction of grain related production costs will see the percentage reducing significantly to lower level thus higher profitability. One major strategy employed by large scale grain growing farmers is the use of modernized farming strategies in production process in order to have higher yield and increase productivity at a lower cost. Example of mechanization processes adopted include use of improved equipment's, certified seeds and production systems of growing, maintenance and harvests (Debertin, 2012).

Studies have shown that there is need for grain farmers to use improved equipment's, tools and facilities to improve production. Proper mechanization involves adopting suitable machines to replace the traditional way of crop production. Ali (2002) did a study on the relationship of adopting new technologies and crop production and found that there is positive relationship between two of the variables. The author did identify how mechanization has help farmers in Narok to increase their wheat yields by adopting

new technologies and machines in production. One farmer in the report mentioned that by using the machines the yields increased by 12% compared to the previous yields.

Asefa (2011) on his case study on technical capability of small holders' farmers in Ethiopia farms found that if farmers use approved seeds it reduces risk related to non-production. From the study the author mentions the need to adopt certified seeds in crop production to reduce risks affecting crop maturity and finally production. Some of the farmers in the case study did mention that their farm yields had multiplied once they had started using certified seeds. The finding from the study is a clear indication for grain farms to employ use of certified seeds to increase grain production.

Mose, Mbeche and Ateka (2016) opines the need for farmers to improve grain production farming systems every year. Both authors state that systems involve use of better methods, techniques and practices used in crop production. The study acknowledges that every year the conditions are different for crop production that requires farmers to have flexible systems that can enhance grain farming productions. The study is a clear indication that farmers require to have improved systems that are relevant to the prevailing conditions in order to increase their crop production.

Ogada et.al. (2014) explains the need for soil testing to improve grain growing production in different soil types and conditions. The author clarifies that soil testing is important in identifying plant needs in terms of minerals and nutrients. Farmers are required to use modernized systems of soil testing that will be useful in choosing the required fertilizers to be applied in their farms. This finding by the author shows the need for farmers to adopt soil testing mechanisms to enhance grain productions in their farms.

The nature of grains allows it to be stored for future usage and consumptions. Storage of grains involves the process of drying, treatment, and preservation for later years to come. Asefa (2011) states that the main goal of grain storage is anticipation of future rise in prices. The emergence of 'silo' during colonial time necessitated the current need of grain storage. It is reported that majority of small- and large-scale farmers have small storing units in their homes. Debertin (2012) states that Kenya farmer's research unit estimates that grain growers loose about 20 million tons of produce due to poor storage methods and techniques. Currently some of the large farmers have invested on big go downs, and storage facilities with modern handling facilities this has enabled them to tap more opportunities in the market.

2.5. Empirical studies on strategies on risk management and productivity

Agricultural risks are one of the main contributors that discourage the willingness of potential farmers to engage in crop production or increase investments in agriculture activities. A number of farmers have withdrawn from farming after suffering substantial losses. Risk management then becomes one important component that ensures a farmer is safeguarded from risks, and entice them to undertake activities with higher investments and risk. Studies have shown that higher risks are manifested among small scale farmers compared to the large-scale farmers. But the risks are manageable or self-driven caused by the ability of certain farmers to slowly or unwillingness to adopt risk aversive systems and methods. Farmers with good systems and methods to risk aversion have improved outputs (Gorton & Davidova, 2001).

Risk management strategies begins with the process of identifying the probable risks facing grain growers in their farms. The common risks facing grain growing farmers are classified into three categories. First, there are natural occurring risks like changes in weather patterns, infestation of pests, and outbreak of diseases. Secondly, there are market related risks resulting from changes in pricing of outputs and inputs. Lastly, there are social uncertainty risks like emerging aspects occurring on a daily basis for example wars, and poor policies. Identification of risks becomes a major component for any grain farmer because it directly affects the production process (Farrell, 1957).

Studies have shown that large scale grain farmers are more likely to be cushioned against variability of risks as compared to those practicing small scale farming. Some of the justification of the assertion is on higher investment on risk management techniques and methods. Those with large scale firms have invested a substantial amount of their budget on risk aversion techniques that reduces their risk variability. A study conducted in Western Kenya by Bayene, (2008) found that majority of farmers have resorted to crop diversification in their farms which directly exposes them to more risks affecting the variety of crops.

Nyikal and Kosura (2005) reported that some of the grain farmers are risk averse by preferring activities that provide direct security to cushion them from risks. For example, they decide to adopt well established techniques and methods for crop production thus cushioning them from dangers of failures. Other methods adopted by farmers is to have crop insurance policies and adopting affordable credit policies that has helped to cushion them from risks. The aspect of risk management is not new in Kenya through its various

strategic plans and visions. The national Government of Kenya have a long track in which they have invested heavily on risk mitigation through its development plans. For example, the vision 2030 does recognize the need to strengthen risk management techniques outlined in several programmes and institutions proposed. For example, the Drought Risk Management Authority was instituted in the year 2011 to address response rates in food production related risks. Other agencies that were instituted included the National Climate Change Action Plan Authority and National Hunger Safety Net program to help solve problems related to disasters and climate change in crop production (Debertin, 2012).

2.6. Empirical studies on grain growing farming support strategies and productivity

Support strategies covers a wide range of services in agriculture from expert seeking opinions, market networking, advisory systems, and extension programs. The main goal of having support strategies in agriculture or crop production is to share information and feedback on better methods of growing, maintenance, storage and marketing products. Farmers who have embraced grain growing farming support strategies have been able to improve production and increase productivity significantly. Large scale farmers have been reported to have embraced support strategies from external bodies than their small-scale counterparts due to the main reason of commercialization by increasing targeted profits (Gorton & Davidova, 2001).

Farmers in Brazil have embraced public-private supported extension services as part of their daily running of their farming activities. The extension services have been useful in providing key information related to modern practices for using technology in grain

production. It also builds the capacity of farmers to form their own networks that they can learn from each other. Farmers are exposed to new methods of managing climate and ensuring climate related problems are effectively managed. Grain farmers in Brazil have benefited from public support in which they are able to get proactive information to avert risks and encourage more productions. One of those benefits are like reliable weather forecast, accessibility to credit and seed delivery.

Ogundari, Ojo and Ajibefun (2006) mention the need of grain farmers acquiring favorable and affordable credit facilities to enhance crop production especially cereals. According to the study farmers are able to apply all the required inputs to crop production will highly depends on the availability of capital. In most cases resources are scarce this makes them not to meet all the required inputs for their respectful farmers. Farmers are required to identify suitable credit services agencies that will help support their production process. More farmers can increase their yields or productivity if only they provide the necessary inputs for their farms.

Rosenbaum and Rubin (1983) in a survey report identified the key role of seeking advice from experts during agricultural crop production. The report provides a positive relationship between farmers seeking advisory opinions and increase productivity of their firms. There are several agencies, individuals, input sellers and government officials that can help in providing the necessary information which can be useful to the farmers. Some of the advices can range from: emergence of new varieties, improved methods of operations, risk management techniques, marketing of produce, networking's and

financial literacy. It is important in the current situations that any grain farmer to have positive relationship with key stakeholders that might add value to their farms.

In recent times marketing of produce in agriculture have evolved to meet the current changing needs of the farmers. Gorton and Davidova, (2001) states that there is emergence of technologies in which farmers are able to network and market their produce. Globalization has also taken a hand in opening up new markets, and creation of new opportunities for selling. Over the year's farmers have been challenged on finding markets for their produce. Grain farmers are the most affected for they lack reliable market for their produce. Majority of the grain farmers are highly depended on the Government and millers to buy their produce. Marketing has continued to be the greatest challenge among grain farmers due to limited market accessibility. Large scale farmers are taking advantage of economies of scale where they are able to sell large produce easily due to its marketability. Traders and other buyers prefer to buy large number of produce in one locality at a better price than buying small in retails. But there is need for grain farmers to still better their marketing strategies (Debertin, 2012).

2.7. Summary of literature and knowledge gap

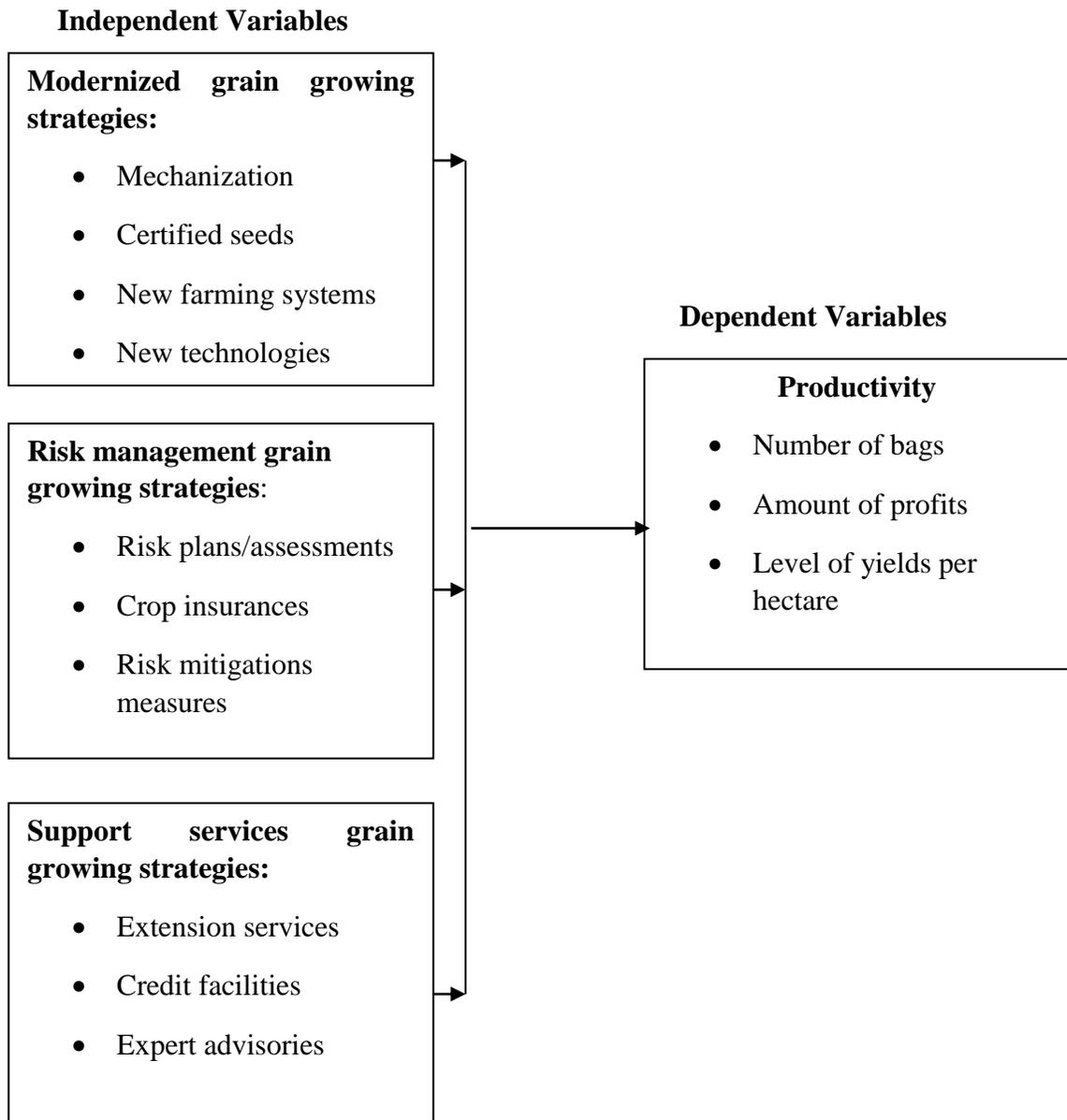
The section was able to review literature from several sources both empirical and theoretical. A number of studies reviewed provided a clear picture of necessity of farmers to apply certain strategies in grain growing production. One study by Rutto (2015) among smallholder's farmers on marketability of maize produce indicates one of the many problems facing farmers in Soy Sub County which need to be addressed in order to increase the required yields. The current study further outlines a broad view to fill the gap

that the study did not fill by providing strategies that grain growers' farmers can use to enhance their productivity. Kipsang (2014) study is related to the study whereas it mentions the extent to which risks affect productivity of wheat crops. One of the objectives of the study is the extent to which farmers are using risk management strategies in their farms. The gap found in the study by Kipsang was that the author focused on the effects of the risks rather than mentioning example of risk management plans adopted by the grain farmers. In summary, majority of the studies reviewed focused generally on other crops no studies directly addressed grain growing farming, and did not link with strategies in which the current study seeking to fulfil as part of the knowledge gap.

2.8. Conceptual framework

The conceptual framework represents a visual representation of the relationship between grain growing strategies and productivity. The grain growing strategies covers variables like: modernized grain growing strategies, risk management strategies and support services strategies. Figure 2.1 shows the conceptual framework for the study.

Figure 2.1. Conceptual framework



Source: Researcher 2019

CHAPTER THREE: RESEARCH METHODOLOGY

3.1. Introduction

This section provided a systematic logical step to be followed during data collection, and justifications of the various steps that will be employed to achieve the study objectives. It begun by providing the study design plan, the key informants of the study, method of obtaining sample size, data collection procedures, and technique to analyze data into valuable information.

3.2. Research design

The study focused at obtaining quantitative data from the various targeted population. To achieve this the study employed descriptive survey research design. Kumar (2019) defines descriptive survey research design to be a method in which detailed information is obtained from a target group using structured questions or forms. The researcher found the method to be relevant because it comprehensively covers the study variables by providing a wide scope for the respondents to answer or provide their opinions towards them.

3.3. Target population

Wahyuni (2012) explains target population to be the main units that are required to provide answers to the goal and objectives of the study. The target population of the study was 158 large scale grain growers farmers found in Soy sub-county in Uasin Gishu County. The number was obtained from the Uasin Gishu County survey reported by the department of Agriculture in 2018. According to the report the classification of the large-

scale farmers was based on the size of the farms which was stated to be 50 hectares and above in which they are growing different types of grains.

3.4. Sample design

Kumar (2019) states that sample design provides a technique in research in which the target groups are converted to become respondents. The author further states that the process of sample design provides a statistical representation in which a sample will be obtained from the target population. The study employed Yamane formula to obtain the required sample size for the study.

The representation of the formula is as follows: n =sample size, N =target population, e =error allocated during sampling ($e=0.05$)

$$n=N / (1+N (e)^2)$$

$$n =158/ (1 +158 (0.05)^2)$$

$$n= 113$$

From the sample determination formula, the study sample size was 113 respondents. The study employed simple random sampling technique to obtain the sample size of 113 from the target population of 113. According to Wahyuni (2012), simple random sampling technique provided a simple method in which representatives were chosen from the entire population without any biasness.

3.5. Data collection

The process of data collection begun by choosing the right instruments to collect data. The research used structured questionnaires to collect data. According to Saunders and Lewis (2012), structured questionnaires provide an easy way of gathering more data within a limited time scope. Structuring of the questionnaire was based on the variables of the study. Farmer's responses will be measured according to the Linkert scale level of measurement. Before commencement of data collection authorization was sought from various institution in which the study was directly involved with. Then that was followed by conducting validity and reliability tests to establish the extent to which the research instruments were to give consistent and accurate results. During piloting of the instruments, a test-retest method was employed then the two set of findings were correlated to become the test for reliability. In addition, the researcher contacted the supervisor in order to verify and scrutinize the nature of questions in order to establish their validity. During data collection the research visited the various farmers in their respective locations. Data collection took three weeks and it was aided by research assistants.

3.6. Data analysis

The process of data collection begun by arranging, organizing, and coding the data into the tool of analysis. The tool of analysis to be employed was Statistical Package for Social Sciences (SPSS) windows 23. The coded data was then be analyzed using descriptive statistics with open ended questions analyzed qualitatively. Saunders and Lewis (2012) define descriptive statistics to be statistical methods that summarize and organize data to obtain valuable presentation. Some of the descriptive statistics used

include; mean, standard deviation, percentages, and frequencies. The study used inferential statistics analysis to outline relationship between the variables. Correlation analysis was used to explain the relationship between grain growing farming and production. The last step of the data analysis procedure was to present and document the findings using frequency tables, statements, and report respectively.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.0. Introduction

The chapter provides the analysis of the key findings found in the questionnaire. The analysis is based on descriptive and inferential statistics. Findings were organized according to the demographics of the respondents, and the objectives of the study which are modernization, risk management and support services. During this study a sample size of 113 farmers were targeted but only 98 of them were found, and presented correctly filled questionnaires. This represented an 87% questionnaire response rate which sufficient to conduct the study this is according to Kumar (2019) who advocates for a response rate of more than 75% for the study to be continued.

4.1. Demographic information of respondents

The respondents were asked to indicate their gender, level of education and age. This information was important for the researcher to understand the extent to which farming activities are conducted based on the features. Findings on demographic is shown as per table 4.1.

Table 4.1: Demographic of the respondents

Question	Class	Frequenc y (n=98	%
Indicate your gender?	Male	76	78
	Female	22	22
Indicate you level of education	Primary & below	12	12
	Secondary	35	36
	Diploma	28	29
	University	22	22
	Post-graduate/above	2	1
Indicate your age category	18-27 years	8	8
	28-37 years	18	15
	38-47 years	37	38
	Above 48 years	35	36

Findings as per table 4.1 showed that 76 (78%) of the farmers were of male gender while 22 (22%) of them were of female gender. This showed that there were more male than female farmers. Findings in table 4.2 further showed that 12 (12%) and 35 (36%) of the farmers had primary level & below, and secondary level of education respectively. While 28 (29%) and 22 (22%) of the farmers had diploma and university level of education respectively. The finding further showed that 2 (1%) had post graduate & above level of education. These findings show that majority of the respondents had basic level of education.

The study further asked the respondents to indicate their age category. This question was important in assessing the frequency of farmers based on their ages. The findings as per Table 4.1 showed 8 (8%) and 18 (15%) had 18-27 years and 28-37 years respectively, while 37 (38%) and 35 (36%) had ages between 38-47 years and above 48 years & above

respectively. The findings from Table 4.1 shows that majority of the farmers were of ages between 38 and 48 years and above.

4.2. Farming information of the respondents

The respondents were asked to state general information related to grain growing. The respondents were asked to state the type of grain they grow in their farms this is important in establishing the dominant grain grown in the region. Findings were summarized as per table 4.2.

Table 4.2: Farming information

Question	Category	Frequency(n=98)	%
Indicate which type of grains you grow in your farm?	Maize	66	67
	Wheat	22	22
	Rice	3	3
	Millet	5	5
	Sorghum	2	2
Have you attended any trainings or workshops on grain growing?	Yes	37	38
	No	61	62
Indicate the category of your total annual yields of the stated grain crops?	0-500 bags	11	11
	501-1000 bags	14	14
	1001-1500 bags	42	43
	1501-2000 bags	23	24
	Above 2001 bags	8	8

Findings as per Table 4.2 showed that 66 (67%) of the farmers grow maize, 22 (22%) of them grow wheat. Other grains grown were rice and millet according to 3 (3%) and 5 (5%) of the farmers respectively. The study established that 2 (2%) of the respondents are growing sorghum in their farms. The established that maize and sorghum is the dominant grain that is grown by the farmers.

The findings as per Table 4.2 on the question that was asked to the respondents whether they had attended any form of trainings or workshops on grain farming were: 37 (38%) of the farmers stated that they have attended trainings or workshops while 61 (62%) stated that they have never attended any form of trainings. This findings in Table 4.2 shows that majority of the farmers have never attended any form of training or workshops.

The study further established as illustrated in Table 4.2 that 11 (11%) and 14 (14%) of the farmers produce yields between 0-500 bags and 501-1000 bags yearly respectively. Other 42 (43%) and 23 (24%) of the farmers produce 1001-1500 bags and 1501-2000 bags of yield yearly. A small number of farmers 8 (8%) produce grain yields that is above 2001 bags. This findings in Table 4.2 clearly shows that majority of the farmers are large scale grain growers producing yields between 1000 to 2000 bags annually.

4.4. Grain growing farming modernized strategies and productivity

The study sought to establish the extent to which farmers are applying the grain growing modernized strategies in their farms. In addition, the study sought responses how these strategies have contributed to improved yields in their farms.

4.4.1. Application of grain growing modernized strategies

Respondents were asked to state whether they employ grain growing modernized strategies in their farms. Findings to the questions were analyzed qualitatively and reported as follows: 77(79%) of the farmers agreed to be using modernized technologies, while 21 (21%) of the farmers stated that they are not using modernized technologies.

Those farmers who are using modernized technologies provided some examples of the strategies for example; using improved machinery and equipment, modernized weed treatments, certified seeds, and scientific methods of planting. These findings show that majority of the grain growers are using modernized strategies in their farms to enhance productivity.

4.4.2. Relations on grain growing farming modernized strategies and productivity

The respondents were provided with statements that indicate the influence of grain growing farming modernized strategies have on productivity. The findings of the analysis were presented as per table 4.3.

Table 4.3: Grain growing farming modernized strategies and productivity

Statements	5	4	3	2	1	Mean	SD
Farm mechanization has increased the number of yield per hectare.	33(34%)	34(35%)	2(6%)	16(16%)	13(13%)	3.591	0.764
Use of certified seeds have increased the number of bags produced.	46(47%)	33(34%)	1(1%)	7(7%)	6(6%)	3.876	0.654
Adoption of new farming systems have increased profitability in the farm.	38(39%)	43(44%)	2(6%)	8(8%)	7(7%)	3.945	0.544
Use of modernized techniques in the farm increases productivity.	51 (52%)	32 (33%)	3(3%)	6 (6%)	6 (6%)	3.975	0.654

Key: 1=never, 2=rarely, 3=occasionally, 4=moderate amount, 5=A great deal

Findings in Table 4.3 shows that 33 (34%) and 34 (35%) respondents in a great deal and moderate amount agreed that farm mechanization has increased the number of yields per hectare, and 2 (6%) of the respondents stated that it does occasionally. The study further found that 16 (16%) and 13 (13%) of the respondents stated that farm mechanization has never or rarely increased the number of yields per hectare respectively. The study found that respondents with a mean of 3.591 (SD=0.764) stated that occasionally farm mechanization has increased the number of yields per hectare.

The study found as per Table 4.3 that 46 (47%) and 33 (47%) in a greater deal and moderate amount respectively agreed that use of certified seeds have increased the number of bags produced. While 7 (7%) and 6 (6%) of the respondent's state that certified seeds have rarely or never increased the number of bags produced respectively. Only 1(1%) of the respondents stated it does occasionally. The study further found that respondents with a mean of 3.876 (SD =0.654) in a moderate amount agreed that use of certified seeds have increased the number of bags produced.

The study further illustrated as per Table 4.3 that 38 (39%) and 43 (44%) in a great deal and in a moderate amount agreed that adoption of new farming systems have increased profitability in the farm. The study further established that 8(8%) and 7(7%) stated that adoption of new farming systems has rarely or never increased profitability in the farm. Only a few numbers of respondents 2(6%) stated that it occasionally does so. The study other findings were that respondents with a mean of 3.945 (SD=0.544) in a moderate amount agreed that adoption of new farming systems have increased profitability in the farm.

Finally, as per summarized findings as per Table 4.3 showed that 51 (52%) and 32 (33%) stated in a great deal and moderate amount agreed that use of modernized techniques in the farm increases productivity. The study further found that 6 (6%) and 6 (6%) of the respondents stated that use of modernized techniques has rarely and never increased productivity in the farm respectively, only 3(3%) stated that it does occasionally. The study based on respondents with a mean of 3.975 (SD=0.654) agreed in a moderate amount that use of modernized techniques in the farm increases productivity.

4.4.3. Challenges of employing farming modernization

The respondents were asked to state some of the challenges they are faced when employing modernization in their farm. The findings of the open question were then analyzed and presented qualitatively as follows: majority of the farmers stated that they lack relevant and timely information regarding farming systems in which they cannot make appropriate decisions in their farms. Another challenge mentioned is that modernized equipment are too expensive or costly that they cannot afford to buy, hire or purchase. A number of farmers stated that they lack required skills to employ some of the modernized farming systems.

4.5. Strategies on risk management and productivity

The second specific objective was to establish the extent to which strategies on risk management influence productivity. The information on the applicability of risk management strategies, risk association with productivity, and challenges faced in addressing risk management in their farms was assessed and analyzed in this section.

4.5.1. Applicability of strategies on risk management

The grain farmers were asked qualitatively whether they are applying risk management strategies in their farms. Findings to the question was presented as follows: 67% of the respondents agreed to be using risk management strategies in their farms, while 33% stated that they do not understand, and are not applying any risk management strategies. For those who agreed to be employing the risk management strategies they provided examples like; forecasting of planting seasons, calculation of germination seed rates, insuring some of the produce, and diversifying grain varieties in their farms. This finding shows that risk management strategies are employed in farms.

4.5.2. Strategies on risk management and productivity

The study sought to finding from the grain farmers to state their level of agreement that defines the influence in which risk management strategies contribute productivity. These statements were important in explaining the extent to which strategies on risk management contributes to productivity. Findings to the responses were summarized according to Table 4.4.

Table 4.4: Strategies on risk management and productivity

Statements	5	4	3	2	1	Mean	SD
Risk plan have helped to increase yields per hectare	23(23%)	24(24%)	8(8%)	19(19%)	24(24%)	3.464	0.532
Crop insurances have enhanced productivity in the farm	38(39%)	29(30%)	11(11%)	17(17%)	20(20%)	3.765	0.564
Risk mitigation initiatives have improved productivity levels in the farm	27(28%)	34(34%)	5(5%)	18(18%)	14(14%)	3.742	0.672
Risk management is useful in enhancing productivity	48(49%)	35 (36%)	7(7%)	5 (5%)	3 (3%)	4.022	0.642

Key: 1=never, 2=rarely, 3=occasionally, 4=moderate amount, 5=A great deal

n=296

The study in Table 4.4 established that respondents with 23 (23%) and 24 (24%) did in a great deal and in a moderately amount agree respectively that risk plan have helped to increase yields per hectare, while 8 (8%) and 19 (19%) did mention rare and never that it does so. Only 24 (24%) of the respondents stated it does occasionally. The mean average of the equation was 3.464 (SD=0.532). Which means the respondents did not agree that risk plan have helped to increase yields per hectare.

The study established that respondents 38(39%) and 29(30%) did state in a great deal and moderate amount respectively that crop insurances have enhanced productivity in the farm, while 11(11%) and 17(17%) of the respondents stated that it is in a rare and it has

never enhanced productivity. About 20(20%) stated that it does occasionally. The study further established that respondents with a mean of 3.765 (SD=0.564) in a moderate amount agreed that crop insurances have enhanced productivity in the farm. These findings show that crop insurance is important in enhancing productivity in the farms.

The study found that 27(28%) and 34(34%) stated that in a great deal and moderate amount risk mitigation initiatives have improved productivity levels in the farm, while 5(5%) and 18(18%) stated that it has rarely and it has never respectively improved productivity. About 14(14%) of the respondents stated that it does so occasionally. The study found that respondents with a mean of 3.742 (SD=0.672) stated that in moderate amount risk mitigation initiatives have improved productivity levels in the farm. The findings show that risk mitigation have improved productivity in the farms. The study further established that 48(49%) and 35 (36%) stated that in a great deal and moderate amount respectively the risk management is useful in enhancing productivity, while 7(7%) and 5 (5%) of the respondents stated that it has rarely or never done so respectively. About 3 (3%) of the respondents stated that it does so occasionally. Finally, respondents with a mean of 4.022 (SD=0.642) in a moderate amount agreed that risk management is useful in enhancing productivity. These finding shows that risk management strategies are important in enhancing productivity in the farms.

4.5.3. Challenges in implementing risk management strategies

The respondents were asked qualitatively to mention risks they encounter in implementing risk management strategies in their farms. Some of the responses were: they lack the necessary knowledge and skills to carry out risk management strategies, the weather and environment is dynamic and influences forecasting of risks negatively, and it takes more capital when conducting such initiatives.

4.6. Grain growing farming support strategies and productivity

The third objective of the study was to establish the extent to which grain growing farming support strategies influence productivity in the farms. The respondents were asked to state whether they are able to get the farming support strategies and the extent to which they are helpful in productivity in their farms.

4.6.1. Accessibility to farming support

The respondents were asked on whether they access any form of farming support in their farms. The responses to the question was analyzed qualitatively as follows: 56% of the respondents agreed that they are accessed to the farming support in their farms, while 44% of the respondents stated that they are accessed to the farming support. For those who agreed that they get support they gave some of the examples of the support received like: trainings, extension services, advisory and free clinics from well-established farms.

4.6.2. Grain growing farming support strategies and productivity

The study sought to find from the respondents the extent to which they are on grain growing support strategies influence on productivity. It was important in knowing the extent to which farming support strategies influence productivity. Findings of the question was presented in table 4.5.

Table 4.5: Grain growing farming support strategies and productivity

Statements	5	4	3	2	1	Mean	SD
Extension services support have increased more yield per hectare	48(49%)	35 (36%)	7(7%)	5 (5%)	3 (3%)	4.222	0.732
Credit facilities received have enhanced productivity in the farm	48(49%)	34(35%)	6(11%)	15(16%)	12(11%)	3.851	0.674
Expert advice have helped to increase the number of bags produced	27(28%)	34(34%)	5(5%)	18(18%)	14(14%)	3.742	0.592
Support services is important component in enhancing productivity	38(39%)	45 (46%)	4(4%)	8 (8%)	3 (3%)	4.148	0.841

Key: 1=never, 2=rarely, 3=occasionally, 4=moderate amount, 5=A great deal

n=296

Findings in table 4.5 shows that 48(49%) and 35 (36%) respondents in a great deal and moderate amount agreed that extension services support have increased more yield per hectare, and 7(7%) of the respondents stated that it does occasionally. The study further

found that 15(16%) and 12(11%) of the respondents stated that extension services support has rarely and never increased more yield per hectare respectively. The study found that respondents with a mean of 4.222 (SD=0.732) stated that in a moderate amount extension services support have increased more yield per hectare. This shows that Extension services support have increased more yield per hectare.

The study found as per table 4.5 that 48(49%) and 34(35%) in a greater deal and moderate amount respectively agreed that Credit facilities received have enhanced productivity in the farm. While 7(7%) and 6(6%) of the respondents' state that Credit facilities received have rarely or never increased productivity in the farm respectively. Only 6(11%) of the respondents stated it does occasionally. The study further found that respondents with a mean of 3.851 (SD=0.674) in a moderate amount agreed that Credit facilities received have enhanced productivity in the farm. The study denotes that credit facilities are important in enhancing productivity in the farms.

The study further illustrated as per table 4.5 that 27(28%) and 34(34%) in a great deal and in a moderate amount agreed that expert advice have helped to increase the number of bags produced. The study further established that 18(18%) and 14(14%) stated that expert advice has rarely or never increased increase the number of bags produced. Only a few numbers of respondents 5(5%) stated that it occasionally does so. The study other findings were that respondents with a mean of 3.742(SD=0.592) in a moderate amount agreed that expert advice have helped to increase the number of bags produced. This shows that expert advices are important in enhancing the number of bags being produced.

Finally, as per summarized findings as per table 4.5 showed that 38(39%) and 45 (46%) stated in a great deal and moderate amount agreed support services is important component in enhancing productivity. The study further found that 8 (8%) and 3 (3%) of the respondents stated that support services has rarely and never enhanced productivity in the farm respectively, only 4(4%) stated that it does occasionally. The study based on respondents with a mean of 4.148 (SD=0.841) agreed in a moderate amount that support services is important component in enhancing productivity.

4.7. Challenges accessing farming supports

There are several challenges that respondents face when accessing farming supports in their farms. According to them some of the challenges included the following which were illustrated qualitatively: no experts visiting their farms, lack of government support and changes in the environment have significantly influenced their decision-making process. They stated that the government need to give priority to ensure that these challenges are taken care off or addressed effectively by the concerned persons.

4.7. Inferential statistics

Inferential statistics was used to analyze relationship between the study two key variables. Person moment correlation was used to provide analysis between the variables with a scale of 1=no correlation and above 0.65 correlated.

Table 4.6: Correlation analysis of modernized farming practices and productivity

		Modernized farming practices	Number of yields
Modernized farming practices	Pearson Correlation	1	.687*
	Sig. (2-tailed)		.015
	N	98	98
Number of yields	Pearson Correlation	.687*	1
	Sig. (2-tailed)	.015	
	N	98	98

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.6 shows the P value =0.015 of correlation which shows a close relationship between modernized farming practices and productivity.

Table 4.7: Correlations between risk management strategies and productivity

		Risk management strategies	Number of yield produced
Number of yields produced	Pearson Correlation	1	0.743*
	Sig. (2-tailed)		.579
	N	98	98
Risk management strategies	Pearson Correlation	0.743*	1
	Sig. (2-tailed)	.579	
	N	98	98

Table 4.7 shows a correlation p-value=0.579 which shows a close relationship between risk management strategies and number of yields produced.

Table 4.8. Correlations of farming support strategies and productivity

		Farming support strategies	Number of yields produced
Number of yields produced	Pearson Correlation	1	.687*
	Sig. (2-tailed)		.015
	N	98	98
Farming support strategies	Pearson Correlation	.687*	1
	Sig. (2-tailed)	.015	
	N	98	98

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.8 shows a correlation p-value =0.687 that shows a close relationship between the number of yields produced and farming support strategies.

CHAPTER FIVE: SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.0. Overview

The chapter provides a summary of findings that was denoted from chapter four. The summary is the key findings of each research question asked. The section further outlines the conclusion, limitations, recommendations and suggestions for further studies.

5.1. Summary

The study sought to establish the extent to which farmers are applying the grain growing modernized strategies in their farms. Findings showed that respondents in a great deal and moderate amount agreed that farm mechanization has increased the number of yield per hectare. The study found that use of certified seeds have increased the number of bags produced. The study further illustrated that adoption of new farming systems have increased profitability in the farm. Finally, as per summarized findings showed that respondents stated that use of modernized techniques in the farm increases productivity. Majority of the farmers stated that they lack relevant and timely information regarding farming systems in which they cannot make appropriate decisions in their farms. Another challenge mentioned is that modernized equipment are too expensive or costly that they cannot afford to buy, hire or purchase. A number of farmers stated that they lack required skills to employ some of the modernized farming systems. The study shows a positive relationship between grain growing modernized strategies and productivity.

The second specific objective was to establish the extent to which strategies on risk management influence productivity. The findings were 67% of the respondents agreed to be using risk management strategies in their farms. The study established that respondents agree that risk plan have helped to increase yields per hectare. The study established that respondents that crop insurances have enhanced productivity in the farm, and risk mitigation initiatives have improved productivity levels in the farm. Finally, respondents agreed that risk management is useful in enhancing productivity. Farmers stated that they lack the necessary knowledge and skills to carry out risk management strategies, the weather and environment is dynamic and influences forecasting of risks negatively, and it takes more capital when conducting such initiatives. The positive relationship between risk management strategies and productivity.

The third objective of the study was to establish the extent to which grain growing farming support strategies influence productivity in the farms. The study found that 56% of the respondents agreed that they are accessed to the farming support in their farms, while 44% of the respondents stated that they are accessed to the farming support. Findings agreeing that extension services support have increased more yield per hectare, and 7(7%) of the respondents stated that it does occasionally. The study found agreed that Credit facilities received have enhanced productivity in the farm, and expert advice have helped to increase the number of bags produced. Finally, as per summarized showed that respondents agreed support services is important component in enhancing productivity. There are several challenges that respondents face when accessing farming supports in their farms. According to them some of the challenges included the following which were illustrated qualitatively: no experts visiting their farms, lack of government support and

changes in the environment have significantly influenced their decision-making process. There was a positive relationship between farming supports and productivity.

5.2. Conclusion

The study concludes that majority of the grain growers are using modernized strategies in their farms to enhance productivity, use of certified seeds have increased the number of bags produced, and farm mechanization has increased the number of yields per hectare. It is found that adoption of new farming systems has increased profitability in the farm. This study further found that risk management strategies are employed in farms, crop insurance is important in enhancing productivity in the farms. These shows that risk management strategies are important in enhancing productivity in the farms. The findings risk mitigation has improved productivity in the farms. The study concludes that crop insurance is important in enhancing productivity in the farms. The study concludes that risk management strategies are important in enhancing productivity in the farms, and risk mitigation have improved productivity in the farms. Extension services support have increased more yield per hectare, and credit facilities are important in enhancing productivity in the farms. The study further concludes that expert advices are important in enhancing the number of bags being produced. In general, there are certain farming strategies that are employed by large scale farmers that help them enhance productivity in their farms.

5.3. Recommendations

The study recommends the following findings to various stakeholders directly and indirectly affected by the research project outcome.

The ministry of agriculture representing the government they need to formulate policies that will be useful in enhancing productivity among grain growers across the country.

This is by formulating relevant policies that address farm mechanization, farming support schemes and risk management initiatives. They should strive on training farmers on such strategies in order to enhance productivity.

The grain grower's farmers they need to adopt some of the suitable strategies that would help them enhance their productivity. For example, they need to adopt modernized methods of farming, use of certified seeds, and modern farming systems to increase their yield. In addition, they need to adopt risk management strategies in their farms, and sought for farming support initiatives.

Scholars and researchers will need to use the findings of the study to identify the necessary gaps that will form their future studies, and use it as part of the secondary data during literature review of their studies. Scholars can use it as part of reading source material.

5.4. Limitations

The limitation of the study was on the geographical location of the respondents. The researcher had to travel several distances to obtain the required sample size and tracing them was difficult activity. This challenge was mitigated by having a research helper from the region who was able to locate the various respondents.

5.5. Future suggestions

Future studies should be conducted in other regions or counties to ascertain the extent to which these findings are empirically true. In addition, future studies to be conducted on other types of crops to have a wide scope of agricultural findings. Future researchers need to use different methodologies to ascertain the current study findings.

REFERENCES

- Ali, B. (2002). *Characteristics and Production Costs of U.S. Wheat Farms*. Electronic Report from the Economic Research Service.
- Asefa, S. (2011). *Analysis of Technical Efficiency of Crop Producing Smallholder Farmers in Tigray, Ethiopia*. Munich Personal RePEc Archive (MPRA) Paper No. 40461, Mekelle University.
- Beyene, A.D. (2008). *Determinants of off-farm participation decision of farm households in Ethiopia*. *Agrekon*, 47(1), 140-161.
- Chamber, R. G. (1988). *Applied Production Analysis*, Cambridge: Cambridge University Press
- Chand R., Prasanna, L. & Singh, A. (2011). Farm Size and Productivity: Understanding the Strengths of Smallholders and Improving Their Livelihoods, *Review of Agriculture. Economic and Political Weekly Supplement*, Vol. XVI (26) & 27 (5).
- Debertin, D. L. (2012). *Agricultural Production Economics, 2nd Eds*. New Jersey: Macmillan Publishing Company.
- FAO, (2011). The State of the World's Land and Water Resources for Food and Agriculture. <http://www.fao.org/docrep/017/i1688e/i1688e00.htm>
- Farrell, M. J. (1957). The Measurement of Productive Efficiency, *Journal of the Royal Statistical Society*, Series A (General), Vol. 120 (3): 253-290.
- Gorton, M. & Davidova, S. (2001). Farm Productivity and Efficiency in the CEE Applicant Countries, *Agricultural Economics*, 30: 1–16.
- Kumar, R. (2019). *Research methodology: A step-by-step guide for beginners*. Sage Publications Limited.
- Mose G. N., Mbeche R. & Ateka, J. (2016). Institutional Innovations for Smallholder Agricultural Production Systems in Kenya: A Case of Smallholder Tea Subsector, *European Journal of Sustainable Development* (2016), 5, 3, 461-475.

- National Cereal and produce Board (NCPB) (2018) Food security: a post-modern perspective. *Food Policy*. 21 (2): 155-170.
- Nyikal R.A and Kosura W.A. (2005) Risk Preference and Optimal Enterprise Combinations in Kahuro Division Murang'a District, Kenya. *Agricultural Economics*, 2(4), p.140-154.
- Ogada M. J., Muchai, D., Mwabu G. & Mathenge, M. (2014). Technical Efficiency of Kenya's Smallholder Food Crop Farmers: Do Environmental Factors Matter? *Journal of Environment, Development and Sustainability; a Multidisciplinary Approach to the Theory and Practice of Sustainable Development*; Vol. 16 (5).
- Ogundari, K., Ojo, S. O. & Ajibefun, I. A. (2006). Economies of Scale and Cost Efficiency in Small Scale Maize Production: Empirical Evidence from Nigeria. *Journal of Social Science*, Vol. 13(2): 131-136.
- Rosenbaum, D. & Rubin, B. (1983). The Central Role of the Propensity Score in Observational Studies for Causal Effects Paul R. *Biometrika*, Vol. 70 (1): 41-55.
- Rutto, C. (2015). *Factors influencing marketability of maize produce among smallholders farmers in Soy sub-County*; Unpublished thesis, University of Nairobi.
- Saunders, M. N., & Lewis, P. (2012). *Doing research in business & management: An essential guide to planning your project*. Pearson.
- Wahyuni, D. (2012). The research design maze: Understanding paradigms, cases, methods and methodologies. *Journal of applied management accounting research*, 10(1), 69-80.

APPENDICES

Appendix I: Letter of transmittal

KOSGEI PHYLIS

UNIVERSITY OF NAIROBI

ELDORET LEARNING CENTRE

TO THE CONCERN INSTITUTION

.....

I am a student at University of Nairobi, Eldoret learning center pursuing a Masters of Business administration course (strategic option). As part of my course requirements I am required to conduct a research. The research title I am intending to study is; ‘strategies employed by large scale grain growing farmers on productivity in SOY sub county, Uasin Gishu county.’ I am seeking your permission and authority to help in achievement of this study. The researcher will be ensuring that required ethical and professional aspects in research will be followed fully.

Thank you in advance for your assistance

Yours faithfully

Phyllis Kosgei

Appendix II: Questionnaire

Kindly, thank you for participating in filling the following questionnaire your privacy will be highly appreciated.

Kindly indicate your mark on the space provided.

<u>SECTION A: DEMOGRAPHIC INFORMATION OF THE RESPONDENTS</u>		
1.A.	Indicate your gender?	Male []
		Female []
B.	Indicate you level of education	Primary & below []
		Secondary []
		Diploma []
		University []
		Post-graduate/above []
C.	Indicate your age category	18-27 years []
		28-37 years []
		38-47 years []
		Above 48 years []
2.	Indicate how long have you been farming	4 years & below []
		5- 8 years []
		9-12 years []
		13 years & above []
3.	Indicate which type of grains you grow in your farm?	Maize []

		Wheat []
		Rice []
		Millet []
		Sorghum []
		All []
4.	Have you attended any trainings or workshops on grain growing?	Yes []
		No []
5.	Indicate the category of your total annual yields of the stated grain crops	0-500 bags []
		501-1000 bags []
		1001-1500 bags []
		1501-2000 bags []
		Above 2001 bags []

SECTION B: GRAIN GROWING FARMING MODERNIZED STRATEGIES AND PRODUCTIVITY

5. Have you been applying modern methods of farming?

Yes [] No []

If Yes, mention any.....

6. Mark the number that best reflects your level of agreement with the following statements. **KEY: 1=never, 2=rarely, 3=occasionally, 4=moderate amount, 5=A great deal**

Statements	1	2	3	4	5
Farm mechanization has increased the number of yield per hectare					
Use of certified seeds have increased the number of bags produced					
Adoption of new farming systems have increased profitability in the farm					
Use of modernized techniques in the farm increases productivity					

7. What challenges are you facing when employing modernization in your farm?.....

SECTION C: STRATEGIES ON RISK MANAGEMENT AND PRODUCTIVITY

8. Do you apply risk management strategies in your farm?

Yes [] No []

If yes, mention any.....

9. Mark the number that best reflects your level of agreement with the following statements. **KEY: 1=never, 2=rarely, 3=occasionally, 4=moderate amount, 5=A great deal**

Statements	1	2	3	4	5
Risk plan have helped to increase yields per hectare					
Crop insurances have enhanced productivity in the farm					
Risk mitigation initiatives have improved productivity levels in the farm					
Rik management is useful in enhancing productivity					

10. What risk managements challenges are you facing in your farm?

.....

SECTION D: FARMING SUPPORT STRATEGIES AND PRODUCTIVITY

11. Are you accessed to any farming support? Yes [] No []

If any which ones.....

12. Mark the number that best reflects your level of agreement with the following statements. **KEY: 1=never, 2=rarely, 3=occasionally, 4=moderate amount, 5=A great deal**

Statements	1	2	3	4	5
Extension services support have increased more yield per hectare					
Credit facilities received have enhanced productivity in the farm					
Expert advice have helped to increase the number of bags produced					
Support services is important component in enhancing productivity					

13. What are the challenges of accessing farming support services.....

Thank you