

**EFFECT OF INNOVATION ON PERFORMANCE OF
AGRICULTURAL FIRMS LISTED AT THE NAIROBI
SECURITIES EXCHANGE**

BY

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DECLARATION

I, the undersigned, declare that this is my original work and has not been presented to any institution or university other than the University of Nairobi for examination.

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This research project has been submitted for examination with my approval as the University Supervisor.

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DEDICATION

I dedicate this work to my dear husband Daniel Njau and my family as a whole who have been a source of inspiration for me and their continuous love, encouragement and support during the entire course.

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LIST OF ABBREVIATIONS

ATS	Automated Trading System
CDS	Central Depository System
CMA	Capital Markets Authority
GDP	Gross Domestic Product
MTP	Medium-Term Plan
NSE	Nairobi Securities Exchange
R&D	Research and Development
RBV	Resource Based View
TAM	Technology Acceptance Model

ABSTRACT

The main objective of the study was to explore the effect of innovations on performance of agricultural firms listed at the Nairobi Securities Exchange. The specific objectives of the study were to determine the level of innovations adoption among agricultural firms listed at the Nairobi Securities Exchange and to establish the effect of innovations on performance of agricultural firms listed at the Nairobi Securities Exchange. This study was based on three theories. These are; the resource based view theory of the firm, the diffusion of innovation theory and the technology acceptance model. This research employed qualitative research design and specifically the survey method. Primary data was used in the study. The primary data was collected by use of an interview guide. The qualitative analysis was done using content analysis. Content analysis was used to evaluate the response, draw conclusions and to derive recommendations. The study concluded that there exist a positive relationship between technological capability and firm growth. Emphasis to technological change has been given as a component for the technological capability. Skills, knowledge and experience are required to operate existing systems and to generate technical change from the technological capability. Effective interaction, coordination, and collective action are based on existing capabilities, appropriate incentives, and the empowerment of individuals; thus they rely on voluntary action. Better-connected actors with stronger innovation capabilities help to solve coordination problems among potential partners, build trust for collaboration, build up innovation capabilities, and develop a better understanding of the needs and capabilities among listed agricultural firms. The study also concluded that agricultural firms listed at the Nairobi Securities Exchange have an established intranet and extranet to pass information between and among various department and functional units. The study established that some of agricultural firms listed at the Nairobi Securities Exchange did not have human resource management system. There is a link between human resource management system and competitive advantage in any firm through its role in shaping the skills and motivation of employees. The study recommends that agricultural listed firms should develop products to meet market demand; improve the quality and added value of the agricultural products; Agricultural listed firms should enhance the technological innovation capability and financial strength of agricultural listed firms. This study recommends more funding to digital tools and services departments since they support business operations, from electronic commerce, to firm communications and to internal business systems. This study also recommends integration of key government entities through technology adoption.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Innovation is part of strategy implementation that enhances organization performance through increased expansion and hazard decrease (Drucker, 2001). Advancement techniques are key in enhanced execution among numerous organizations and are reflected by expanded productivity and overall industry development (Palmer & Kaplan, 2007). Yilmaz, Alpkın and Ergun (2005) also recognize innovation adoption as a critical enabler for organization's performance by creating value in the undeniably unpredictable and quickly evolving environment.

This study was guided by several theories for instance, technology acceptance theory, RBV theory and diffusion of innovation theory that have tried to explain the relationships between innovation and performance of firms. Technology Acceptance Model (TAM) clarifies the way clients embrace and make use of an innovative idea. TAM will be applied in this study to establish how technology acceptance influences innovation adoption among listed agricultural firms in Kenya. Resource Based View (RBV) theory as developed by Wernerfelt (1984) suggests that resources enables the firm to achieve competitiveness through enhancing innovations thus firms need to focus on how they can identify and use resources to develop a sustained competitive advantage which will enhance their performance. Diffusion of Innovation refers to the communication of an idea which is considered to be novel to the members of a social system through certain preferred channels. Innovations have to gain acceptability in a wide area in order to be sustainable. This theory has guided the study regarding the adoption of technological innovations in businesses.

In the current globalization wave, characterized by high competition and technological growth, much emphasis has been put on the Kenyan agricultural sector performance. The agricultural sector has had to engage the technological moves to for sustainable productivity and competition. Some of the main innovations being practiced include product development and improvement and creating entirely new set of products among others. Firms which innovate tend to last longer and grow (Kantor, 2001). Examples in Kenya are firms that have adapted paying of goods or services by customers with electronic cards, mobile service such Mpesa and Airtel Money. It has been noted that their businesses have grown tremendously as clients prefer them due to not having to carry cash which is risky. Innovation is also about value adding through processes such as branding (Furst, Lang & Nolle, 2012). Other innovation areas in Kenya are seen in packaging where innovative traders pack up goods in unique attractive wraps that has their business contacts on them.

1.1.1 Innovation

Innovation can be termed as the process by which an idea or invention is changed into a good or service thereby creating value (Kantor, 2001). With regard to the current study, the term only implies to technological innovation and not other innovation types. From the many definitions, technological innovation refers to the scientific and system based process. The process has several influencing factors that affect or are influenced by the internal strengths of the firm which are its technological learning ability and networking capabilities within the external environment. It would harness the existing resources and expand the firm's innovation prospects with the result being the production of improved, new products or even production process (Goh, 2002).

Mechanical advancement tries a more proficient and compelling association and enhanced arrangement between innovation activities and business objectives using personal computers, frameworks, systems and advances. Nadler and Tushman (2006) noticed that, mechanical development is thought to be an innovative and novel process which empowers the formation of new techniques, products and ventures in an association. What's more Swanson (1994) watches that mechanical advancement includes computerized devices in its applications.

As indicated by Lyytinen and Rose (2003) there are four classifications of mechanical advancements. These are: System improvement upgrade, this entails re-adjustments of the involved team in development; goods and services which are a result of the process of development that involve utilization of digital tools and services in the execution of the daily operational activities of the organization; information technology based innovations, which is a new capacity of computing and technology; interdepartmental process integration which involve integration of processes across all the departments. Adoption of technological innovations varies significantly across agricultural institutions. They have differing intensity and range of application of technological capabilities and therefore the technological experience.

1.1.2 Firm Performance

According to Richard, Yip, Johnson and Devinne (2009), firm performance is organization's ability to attain its mission by having proper management, governance, and continuous rededication to results attainment. Efficient non-profits are adaptable, driven by mission, entrepreneurial, focused to the customer, sustainable and outcome oriented. The initiative of firm performance enables the organization to adjust to

increased levels of uncertainty which hinder the attainment of its mission. This initiative seeks to help each organization in every sector of the economy, businesses, charitable organizations and government. The performance of an organization can be measured through examination of the activities it conducts so as to attain its goals. The most notable aspects that can be used to gauge the performance of an organization are the outputs and their effects (Valmohammadi & Servati, 2011).

No consensus has been reached on the best or even the most sufficient measure of firm performance. This is because, there are many varied views of what desirable outcome of organizational effectiveness and because performance is often characterized by theory and research purposes being performed. Performance measurement focuses on the internal processes to determine efficiency and the effectiveness of an action with a given set of metrics. Performance measurement indicators will act as proxies for various phenomena in the organization (Henri, 2003).

Some use financial measures as a criterion to judge the success or fail of a decision or action. Richard et al., (2009), stipulates that performance of an organization covers three specific firm outcome areas: the financial performance that is profits, product market performance that is sales, ROI, ROA, market share and shareholder return that includes economic value added and total shareholder return. There are, however, challenges in using these measures; for starters most managers are unwilling to allow researchers access their financial records, most studies that are available rely on perceived results rather than actual results. Other challenges to using financial measures include; savings are inconsistent from year to year and constantly changing environments make it challenging to compare savings (Bryce & Useem, 1998).

1.1.3 Agricultural Sector in Kenya

Agriculture offers food security to any economy in the world and is also a source of livelihood for a large population. The Agricultural Sector Development Strategy Report (2010) showed that the agricultural sector contributed 25% directly to GDP annually and another 26% indirectly, contributed to 65% of total exports from the country and provided informal employment up to 70% in the rural Kenya. More recent trends show that agriculture contributes about 30% to GDP, 80% to national employment which is mostly informal employment (Business Review, 2015). The sector is comprised of six main sub-sectors, these are crops, food crops, livestock, fisheries, horticulture and forestry and the main factors of production include land, water and institutions such as cooperatives. The major sub-sector is the horticulture one contributing 33% to agricultural GDP and 55% of agricultural exports.

The Kenyan agricultural sector is dynamic, entailing public, non-governmental, parastatal, and the private sector, contributing 65% of Kenya's total exports (GoK, 2011). Besides, it creates employment to over 40% of Kenya's population and also more than 70% in the rural set-up. The agricultural sector also provides livelihoods to over 80% of the population in Kenya (FAO, 2010). This sector is therefore not only a driver of the economy, but also a means of wellbeing for many Kenyans (GoK, 2009). The agricultural performance contributes therefore to growth of other sectors and boosts on Kenyans' livelihood.

A dynamic agricultural sector ensures food security and minimizes poverty, since majority of the vulnerable groups for instance, pastoralists, landless, and also the subsistence farmers highly depend on it as the key sustenance source (Alila & Atieno, 2006). Effective, functioning technological innovations are key in ensuring this is

achieved since this is beneficial to the country as it aims at achieving Vision 2030 (GOK, 2016). These technological innovations will contribute heavily in meeting their mandate as well as enhancing their efficiency and effectiveness which results to influence on their overall performance (Ochieng, 2009).

1.1.4 Agricultural Firms Listed at the Nairobi Securities Exchange

NSE was constituted as a voluntary brokers' association in 1954, it is registered under the Societies Act. It was not until 1988 that NSE was privatised. In 2006, the NSE implemented Automated Trading System (ATS) to enable live trading on the basis of first come first served. This system was also linked to the Central Depository System (CDS) and the Central Bank of Kenya to facilitate trading in Government bonds. Since then, it has undergone various changes and innovations, including the abolishment of the aggregate foreign ownership cap of the NSE listed companies in 2015. The Capital Markets Authority (CMA) is the state regulatory body mandated with licensing and regulating the Nairobi Securities Exchange. Public listings and offers of securities issued and traded at the NSE are also approved by the CMA (NSE, 2017). There are presently 7 agricultural companies registered at the NSE.

The 7 listed agricultural entities are; Eaagads Ltd, Kakuzi Ltd, Kapchorua Tea Co. Ltd, Limuru Tea Co. Ltd, Plantations Ltd, Rea Vipingo, Sasini Ltd and Williamson Tea Kenya Ltd. Eagaads Company limited is located in Thika District, Kiambu county. It's key activities are coffee growing and pulping before delivering it to coffee mills. Kapchorua Tea company limited is a branch of Williamson Tea Farms located at Nandi Hills. It has specialized in tea growing for more than 60 years. Its tea has won several awards due to its bright and strong flavor and also the gold color. Kakuzi Ltd is listed both at the NSE and London stock exchange. It focuses on cultivation, manufacturing

and tea marketing, avocados, pineapples, macadamia production and also marketing, rearing of livestock, and development of forestry (NSE, 2017). Eaagads Ltd was listed in 1972, Kakuzi in 1951 while Kapchorua limited was listed on 1972.

Limuru Tea Company limited is situated at Limuru town, Kenya. In 2013 alone, it produced 2,998,380 kgs of green leaf, which translated to 689,265 kgs of Black Tea. Rea Vipingo Plantations ltd is the largest producer of sisal in Africa having its headquarters in Nairobi. Annual production is at 19,000 tonnes having sisal estates in Tanzania and Kenya. Sasini Ltd produces tea and coffee both in retail and bulk. Moreover, it has yoghurt and pasteurized milk. Williamson owns the Kapchorua, Kaimosi, Tinderet and Changoi tea farms. It provides tea based products like lifeboat teas, gifts, elephant caddies, Mini cru, loose teas and tea bags (NSE, 2017). Limuru tea was listed in 1967, Sasini ltd 1965 while Williamson ltd was listed in 1972.

1.2 Research Problem

A key assumption of most research work done on the improvement of operations has been technological innovations adoption are directly proportional to improvements in performance (Upton & Kim, 1999). The process of technological innovation adoption and implementation forms a critical part in the growth of many nations. A change of past techniques and adoption of local technology similar to that of more advanced industrialized nations lead to indigenous technological innovations (Roehm & Sternthal, 2001). The advancement in technology has made given tasks both cheaper and efficient but it also has its fair share of challenges (Aladwani, 2001). This has seen firms in the banking sector use technology to develop alternative banking channels to reduce costs and enhance efficiency and convenience but still fail (Kombe & Wafula,

2015). This entails a review of the effect of technological innovations adoption have on performance of agricultural firms.

Agriculture is the backbone of the Kenyan economy and contributes to 24% of the national GDP. However, in the past many years, the country has continued to grapple with a persistent deficit of agricultural produce that necessitates importation to supplement local production. This trend is a major concern for policy makers and the country as a whole, because it threatens Kenya's aspiration in the vision 2030 of becoming a food secure nation. Furthermore, given that a majority of the population relies on agriculture as a source of livelihood, this trend is an impediment towards realizing the development goals of poverty reduction and food security. Kenya's vision 2030 MTP II notes that the declining performance of the agricultural sector is attributed to a host of multifaceted challenges that are biophysical, institutional, market, infrastructural, and policy oriented in nature. These challenges include low adoption of technological innovations which the current study seeks to investigate.

Despite the potential benefits of technological innovations adoption, there is debate about whether and how their adoption improves organizational performance (Mabrouk & Mamoghli, 2010). Worch and Truffer (2012) established that the sum productivity and maximization in value of a firm is boosted by operations in innovation. A study by Hafeez (2013) found that there is a positive relationship between companies' profitability and the value added innovativeness. Another study by Kiraka, Kobia and Katwalo (2013) established that process, product, positioning and paradigm types of innovation had a positive performance relationship in some business types of the micro and small enterprises. Odhiambo (2008) established that Standard Chartered Firm (Kenya) Limited bank has been able to successfully introduce various innovative

strategies ranging from product, technological to customer care thus contributing enormously to its profitability over the years. Kiiyuru (2014) established that the commercial banks in Kenya had employed value creation through resource availability, customer satisfaction, retention and pricing in form of market innovation strategies.

Most of the studies conducted on innovations have concentrated on developed countries (Worch & Truffer, 2012; Hafeez, 2013). The few studies conducted locally have not been exhaustive as they have dealt with some aspects of innovations and different contexts (Kiraka, Kobia, & Katwalo, 2013; Odhiambo, 2008; Kiiyuru, 2014). The current study aimed at filling this literature gap by answering these questions; what is the level of adoption of technological innovations by listed firms at the NSE? And what is the effect of innovations on performance of listed agricultural firms at the NSE?

1.3 Objective of the Study

The study sought to determine the effect of innovations on performance of agricultural firms listed at the Nairobi Securities Exchange. The specific objectives of the study were:

- i) To determine the level of innovations adoption among agricultural firms listed at the Nairobi Securities Exchange.
- ii) To establish the effect of innovations on performance of agricultural firms listed at the Nairobi Securities Exchange.

1.4 Value of the Study

This study may be significant in terms of future references to future academicians. The study may identify further areas of research by highlighting related topics critiquing to identify research gaps. The study contributes significantly to technological innovations in the public sector.

Policy makers maybe enlightened by the study findings, by showing them how technological innovations adoption influence organizational performance of agriculture firms and thereby identify mechanisms to be utilized by the regulators to improve performance of such firms which form the framework for achievement of economic growth and development goals of vision 2030. The study may also be geared towards helping firms which are yet to adopt technological innovations. The management of these firms may be able to determine the technological innovations suitable for them to enhance organizational growth and performance.

Findings from the study may also form a foundation for implementing an effective technological innovation practice. The study would help the Government of Kenya when it will be formulating and implementing policies for operational efficiency. Through the results of this study, the agricultural firms would find the benefits realized and how more benefits can be realized for optimal operational efficiency.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter entails theoretical literature review, innovations adoption and its relationship with organizational performance. The chapter also presents the empirical literature review comprising of local and international studies, organizational performance and finally the conceptual framework.

2.2 Theoretical Review

The study was founded on three theories. These were; resource based view theory, the diffusion of innovation theory and the TAM.

2.2.1 Resource Based View Theory

This hypothesis contends that maintained upper hand and enhanced execution by a firm might be acknowledged by misusing profitable, uncommon, non-substitutable and incompletely imitable assets (Hart, 1995). A significant asset or heap of assets enables a venture to bridle openings and diminish dangers in its condition. An uncommon asset or heap of assets is one that isn't controlled by countless. A non-substitutable asset or heap of assets is one for which a proportional asset can't undoubtedly be made by contending entity or entities. An incompletely imitable asset or heap of assets is that which is hard to imitate or one that can be repeated at a critical charge (Hart, 1995). Ignorant (1983) records these assets to incorporate all abilities, resources, hierarchical procedures, learning and data controlled by a firm.

Assets can just extend the firm esteem if only they are utilized in a way that thinks about dynamics outside business condition (Sirmon, Hitt & Ireland, 2007). The assets could

be sorted as substantial or elusive (Mentzer, Min & Bobbitt, 2004) Wagner (2006) contends that technological innovations are defined as the desirable practices acquired from efficient technologies. Desirable practices will support the technological functions in the delivery of services of high quality and sustain superior performance therefore technological innovation interventions are resources falling well within this theory as they lead to boosted delivery of service and performance.

This study hypothesizes that increased bonding levels between technological innovations and sustainability is directly related to the performance and profitability of an entity. Under RBV by exploiting technological innovation practices, manufacturing firms build capabilities for improved organizational performance. This theory becomes critical for the current study since it recognizes an entity's processes, sharing of knowledge and close working relationships as resources which can be used to boost on organizations performance.

2.2.2 Diffusion of Innovation Theory

Diffusion of Innovation refers to the communication of an idea which is considered to be novel to the members of a social system through certain preferred channels (Rogers, 2003). The spread of new ideas is impacted by four variables which are: the actual innovation, social systems, time and communication channels. Of utmost importance is innovations have to gain acceptability in a wide area in order to be sustainable. According to Fisher (1971), adoption of innovation when mapped in the long run forms an S shaped curve. This curve starts at the innovators, followed by early adopters, then early and late majority and lastly the laggards.

How successful an innovation will be stems from the resolutions put forward by the social systems through five defined steps which are; knowledge: such as innovation awareness and continuous learning regarding it; persuasion which means willingness to have detailed knowledge concerning the innovation; resolution, that is, consideration of the pros and cons of the innovation and choice on the adoption of the innovation; application which is an examination of how useful the innovation will be and finally confirmation, which is eventual decision on the continual use of the innovation (Rogers, 2003). The diffusion of innovation model though falls short of explaining the importance of the capability and the dynamics of different inter-connected trading partners and the influence of power between trading partners (Hart & Saunders, 1997). Rogers (1995) describe communication channel as a critical contributor to the success of adoption of new innovation in the organization. As an effective communication channel creates prior awareness of the new technology, the trading partners need to work together to ensure the success of technological innovations. This will be determined by the inter-connected industry the organization is in and how influential that organization is to its trading partners (Lundblad, 2003). This theory has guided the study of the adoption of various innovations in businesses.

2.2.3 The Technology Acceptance Model (TAM)

This model clarifies the way clients embrace/acknowledge and utilize an innovation. TAM was found in 1989 by Davis. This model asserts that once a client is given an alternative innovation, some aspects influence their choices on the means and time of utilization. This incorporates its apparent convenience and seen helpfulness. TAM embraces settled causal chain of genuine conduct convictions, goal and disposition. This was produced by social clinicians from the hypothesis of contemplated activity. In

Davis' study, two vital parts are recognized; seen convenience and seen helpfulness (Davis, Pallister & Foxall, 2002).

In other studies regarding technology, TAM is widely adopted and greatly contributes to the development of a prediction of an one's technology usage (Fishbein & Ajzen, 2010). Perceived ease of use influences the perceived usefulness and the intention for adoption (Davis, 1989). Despite TAM being an important source for theoretical foundation in the study of adoption and use of technology, it has many limitations which include the initial purpose designing the model which is parsimony and generality (Dishaw & Strong, 1999), not taking into consideration non-organizational setting of the organization (Davis & Venkatesh, 2000), and ignoring the factors which moderate the adoption of ICT (Sun & Zhang, 2006).

This theory has affected research in acceptance of technology. In this exploration, TAM will be utilized as a part of three distinctive routes, specifically to discover how the utilization of technology enhances hierarchical administration conveyance to natives, how staff technology preparation impacts the utilization of technology in manufacturing firms and how the accessibility of technology offices impacts the utilization of technological innovations in agricultural firms.

2.3 Innovation Practices

According to Lyytinen and Rose (2003) there are four measures of technological innovations. These are: System development enhancement, utilization of digital tools and services; information technology based innovations and interdepartmental process integration. The measures are discussed in detail below.

2.3.1 System Development Enhancement

System development enhancement involves adding new capabilities to an existing system. Enhancement might also involve adding new features, correcting identified defects and modifying functionality to enhance efficiency. An enhanced system can replace an existing system in any of these three ways: a commercial off-the-shelf system, a new custom-built system or a hybrid of the two. System development enhancement is most commonly implemented to cut costs, improve performance, meet regulatory requirements or to take advantage of modern technologies (Kash & Rycroft, 2011).

An effective way for systems development managers to determine if a system needs an overhaul is to perform an operational analysis. By investing a small amount of time and money, the operational analysis process can resolve the problems and extend the life of the system. Enhancement requests address some minor modification for an existing system. One rule for systems development managers to follow is to define enhancements as projects that require less than 10 days of labor and that can be completed within one calendar month (Wu & Lin, 2009).

2.3.2 Use of Digital Tools and Services

Digital tools and services are used to support business operations, from electronic commerce, to firm communications and to internal business systems. While digital tools and services require an initial resource investment, this kind of investment can bring long run efficiency by streamlining processes and saving time. Digital tools can also open up new avenues for exchange of data and collaboration all of which creates more venues (Kash & Rycroft, 2011).

The three main digital tools and services applied by organizations include extranet, intranet and human resource management and customer association management. An intranet is like an internal internet. It can link employees who working in different locations which enable them to enables them to effectively communicate and collaborate. Customer relationship management tools help organizations manage relationships with their customers systematically, efficiently and profitably (Alstrup, 2010).

2.3.3 Information Technology Based Innovations

Information technology based innovations are continually becoming prominent in improving competitiveness in service operations. Being the action of converting opportunities to become contemporary ideas (Lin & Ho, 2007), information technology based innovations are significant to enable a firm(s) survive severe and tough universal circumstances but maintaining sustainable competitiveness (Wu & Lin, 2009). Several information technology based innovations are used in service science and firm operations. Ho and Lin (2007) came up with an important way to classify information technology based innovation for example Radio Frequency Identification Systems (RFID); automated storage and retrieval systems; global positioning systems (GPS); EDI together with POS.

Information technology based innovations are vital to help firms in surviving antagonistic worldwide money related conditions while likewise getting to be plainly instrumental for producing supportable intensity. This is confirmed by the race towards development and interest in environmentally friendly power vitality (e.g. sun oriented vitality and bioenergy), which is attractive for associations to flourish into what's to

come. Governments in numerous nations have distinguished advancement as a center component of their dynamic strategies. For example, advancement is a critical part in strategies and vital research needs of both creating and created nations, in comprising China, India, United Kingdom and Australia (Lin & Ho, 2007).

2.3.4 Interdepartmental Process Integration

In multi-functional firms where separate departments collaborate to produce a perfect coordination in design, assembled product, technical and production capabilities are critical in ensuring that final product meets the standards. Thus, proper integration is a vital management obligation which balances decentralization and centralization of efficiency in operations within the entire group enabling different participants to homogeneously coordinate energies to attain the goals of an organization. Interdepartmental process integration defines general goals and departmental sub-goals so that everyone articulates their roles and how these results in realizing overall objectives (Nadler & Tushman, 2006).

2.4 Innovations and Firm Performance

The success of many firms mainly is dependent on efficiency in operational processes that originate from technological investments thereby enhancing internal efficiencies of a firm (Munyoroku, 2014). Thus the technological innovation strategies adopted by firms should help them recognize and adopt new revenue opportunities and boost on the satisfaction of customers via delivery reliability. Technological innovation strategies constitute adoption of systems eg the ERPs that offer capabilities aimed at supporting and enhancing processes related to production (Valacich & Schneider, 2012).

McAdam and Keogh (2004) in their research found out that firms that adopt technological innovation have a higher competitive advantage regardless of the competitive environments they are operating in but other researchers considered proper timing and the acceptance of a product as a better measure of the contribution of the innovation to performance.

Kantor (2001) is of the opinion that technological innovation is key factor in economic progress of any country as well as in gaining competitive advantage for different industries. A crucial role for both large firms, medium, small and micro is played by innovation (WladawskyBerger, 2008). Kemp (2003) maintains that innovation has remained to be one of the chief competitive measures of a business. It is also seen by Ruttan (1984) as a very effective means to progress business' productivity should there be resource limitations.

2.5 Empirical Literature Review

The study by Carroll (2016) considered the influence of adoption of IT innovation in a service environment. The study established that technology is adopted suspiciously, actors presuming that it will boost on performance and service efficiency. The research further established that outsourcing technological service capabilities is termed as offloading accountability or 'blame' for service failures in the public sector.

The significance of innovation and how influential it is to the performance of an organization was depicted by the study conducted by Furst, Lang, and Nolle (2012) who considered several companies from five countries. From the findings of this study the differences in performance of firms in the different countries was determined by their innovative capacity: France, England, Germany, United States and Japan.

Gerstenfield and Wortzel (2007) did an analysis of the link between the use of innovation technologies that are internet-based, various innovation types and the financial performance on firm level. Data used was selected from European enterprises totaling 7,302. The findings from the empirical investigation showed that internet-based innovation technologies were significant in enabling innovation in the year 2003. The results also showed that all the technological innovations whether internet-enabled or non-internet-enabled product contributed to positive turnover and growth in employment. Additionally, it showed that higher profitability is mostly the result of the innovative activity of the firm.

The study conducted by Mabrouk and Mamoghli (2010) asserted that as the innovation process continues overtime, banks considered to be innovative will be able to continue enjoying attractive returns on the newer or improved products. However, supernormal profits will decrease following widespread adoption of the new technologies. Grundiche (2004) stipulated that for a firm to ensure that it remains competitive in a dynamic environment and achieve its set objectives of profitability, sales volume and market share, it must make efforts to continually improve products and their lines to meet the desires of customers and their needs that keep changing.

Nwokah, Ofoegbu and Elizabeth (2009) did a study on the variables of product development such as the quality of the product mix which showed a positive correlation to corporate performance variables of sales volume, customer loyalty and profitability. Neely (2002) turnover in terms of sales for firms embracing innovation was faster than firms that do not embrace innovation. They find that there exists a significant association between the innovative sales share and the firm's change in sales turnover. Chesbrough (2010) found that the effects of innovation were reflected in increased

goods and services ranges, improvement in the goods and services quality, and process-oriented outcomes such as improved production flexibility and increased production capacity.

Locally, a study by Odhiambo (2008) considered the innovation strategies adopted by Standard Chartered Bank and established that Standard Chartered Bank just like most banks in Kenya had adopted technological innovation mechanisms to boost on advent of globalization and to ensure their procedures for working together having in mind the end goal of drawing in and keeping up the existing customers. These strategies were adopted now that they touch on all business operations areas originating from the customer mind, mechanical progress to better goods in the market.

A study by Kiraka, (2013) on innovation adoption and small, micro and medium enterprises in Kenya and he found out the growth was more significant in those MSEs that embraced innovation and came up with new ideas. He however noted that not all innovative activities were successful, some faced rejection from the markets where consumers maintained status quo and were always afraid to try new products and hence stuck to what they already believed in.

A study conducted by Wason and Bichanga (2014) aimed at looking at the advancement methodologies adopted by little and medium businesses in Nairobi zone given the worldwide rivalry and found out that SMEs in Nairobi area adopt innovations in technological as a tool in global entrepreneurship to a moderate extent. The study further established that SMEs in Nairobi County adopt technology management as a mechanism in global entrepreneurship.

2.6 Summary of Literature Review

This section has reviewed three theories used in the study namely: the RBV theory of the firm, the diffusion of innovation theory and the technology acceptance model. This study hypothesized that higher bonding level between technological innovations and sustainability is directly associated with an organization's performance and profitability. Under RBV, by exploiting technological innovation practices, agricultural firms build capabilities for improved organizational performance. This theory recognizes processes in the organization, sharing of knowledge and close working relationships as resources that can be used to improve the performance of organizations while diffusion of innovation theory and technology acceptance model explains how innovations spread throughout organizations.

The above literature review indicates that there is little research on the establishment of the relationship between innovations adoption and organization performance thus more studies need to be done. The current study sought to clearly demonstrate relationship between innovation and organization performance among agricultural firms listed at the NSE after which the conclusions will be dispelled after obtaining empirical evidence from the research. Local studies done are not conclusive in their findings and this is the conceptual gap that the current study intends to fill.

2.7 Conceptual Framework

The conceptual framework in figure 2.1 shows how system development enhancement, digital tools and services, information technology based innovations and interdepartmental process integration influence organizational performance of agricultural firms listed at the NSE.

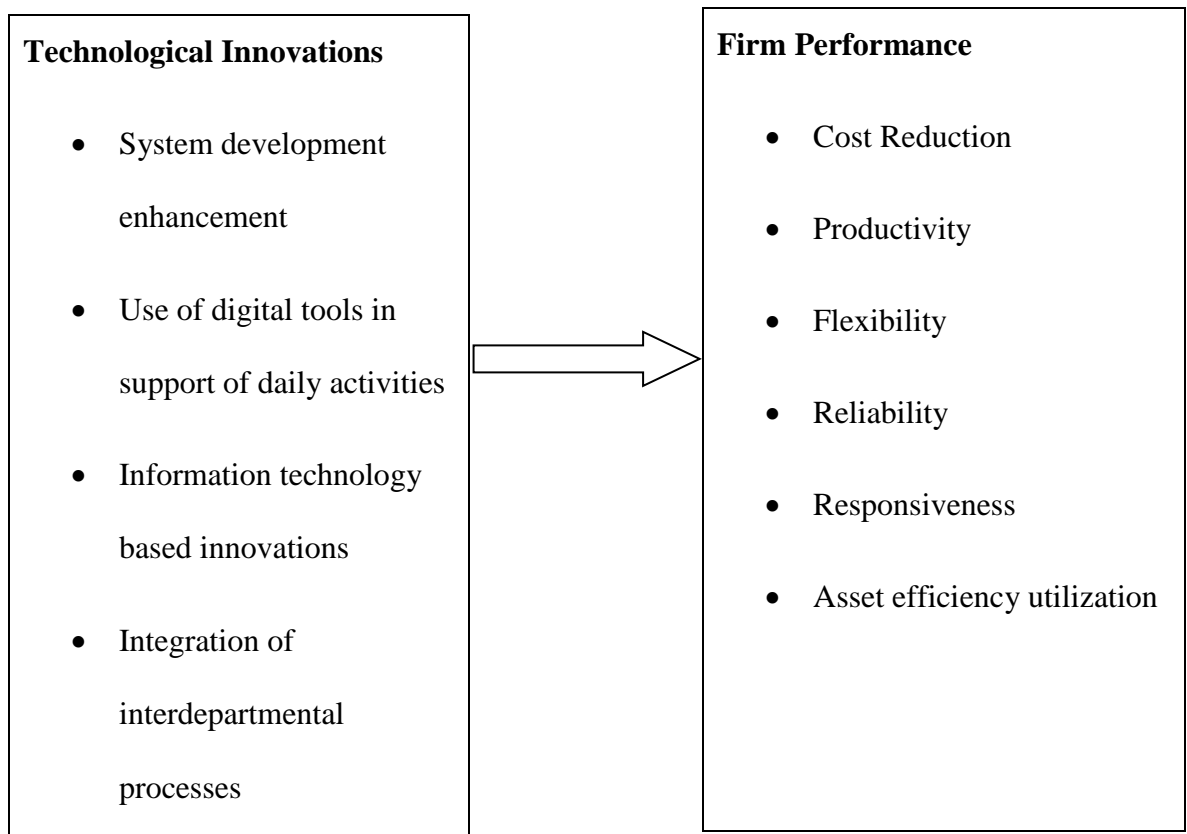


Figure 2.1: The Conceptual Framework

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The section has the description of the methods of research to be applied to determine the effects of innovation on organization performance among agricultural firms listed at the NSE. It also shows the research design, data collection criteria and data analysis.

3.2 Research Design

Mugenda and Mugenda (2003) described research design as that method that is procedurally acquired by the researcher and that which enables the researcher to be able to answers questions accurately, validly, objectively, and economically. According to Khan (2008), a research design aims at improving the ability of the research in conceptualizing an operational plan in order to be able to embark on the various techniques available and required tasks for the completion of the study while at the same time ensuring that the procedures used are sufficient enough to acquire valid, objective and precise responses to the research questions.

This research employed qualitative research design and specifically the survey method. The survey method was used as the main interest of the study is to determine the effects and factors that influence organization performance. The data was collected from employees and the management to help in answering the research question. This helped in gathering the necessary information to facilitate this research project on the effects of technological innovations adoption on organization performance.

3.3 Data Collection

Primary data was used in the study. The primary data was collected by use of an interview guide shown in appendix I. The targeted respondents in this study were managers of agricultural firms listed at the NSE or their representatives. This is because they are involved in the management of the organizations and have a broad understanding of the affairs of their organizations. The researcher interviewed one respondent in each agricultural firm giving a total of seven interviews.

To ensure that the research instrument captures information from respondents as intended, the researcher asked open ended questions that gave room for further prodding if any response is not clear. The researcher personally conducted the interviews. Care and control was achieved by keeping a register of all the questions asked and their responses. The researcher personally conducted the interviews. Care and control was achieved by keeping a register of all the questions asked and their responses.

3.4 Data Analysis

The data obtained from the interview guide was analyzed qualitatively since we can be able to make general conclusions on how data categories are related. Qualitative analysis adopted that enable the researcher to describe, interpret and at the same time criticize the subject matter of the research since it is difficult to do so numerically. The qualitative analysis was done using content analysis.

Content analysis was used to evaluate the response, draw conclusions and to derive recommendations. Content analysis consists of analyzing the interview responses looking for similarities and difference in order to find themes and to develop categories.

According to Khan (2008), content analysis consists of analyzing the contents of documentary materials such as books, magazines, newspapers and content of all verbal materials which can either be spoken or printed. Further, Burns and Burns (2008), insist that content analysis is the systematic qualitative description of the composition of the objects or materials of the study.

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSIONS

4.1 Introduction

Chapter three clarified the methodology used to gather primary information of the investigation: the depiction and determination of examination units, the courses in which in-depth interviews have been analysed, how the information has been broken down and the ways in which legitimacy and dependability have been assured.

This chapter outlines the outcomes and the findings of the primary data that the researcher gathered via the interviews. The study results and outcomes are shown and given in line with the study objectives. The researcher aimed at determining the effect of innovations on performance of agricultural firms listed at the Nairobi Securities Exchange. The collected data was analyzed via content analysis and the findings compared with the study theories and objectives.

Five of the agricultural firms listed in the NSE participated in the study out of the total 6 agricultural firms. This represented a 83.3% response rate indicating insinuating an acceptable return rate. Kothari (2004) argued that a return rate of above 50% is satisfactory for a study. 60% of the participants had master of business administration qualification while 40% had undergraduate qualification. The study interviewed senior management in the information system department.

4.2 Discussion of Findings

The first objective was to determine the level of innovations adoption among agricultural firms listed at the NSE.

Participant I from Kapchorua indicated that “the firm adds new capabilities to the existing system. However, this depends on the needs of the firm for instance report generation and modules”. There exist a positive relationship between technological capability and firm growth. Emphasis to technological change has been given as a component for the technological capability. Skills, knowledge and experience are required to operate existing systems and to generate technical change from the technological capability. The results agree with Carroll (2016) who investigated the impact of IT innovation adoption in a service environment and found technological service capabilities will improve service efficiency and performance.

Participant 2 from Kakuzi noted, that “The firm has invested in new capabilities. At Kakuzi, the firm has invested in Enterprise resource Payment System”. The desire by firms to obtain sustainable business performance and growth is at the centre of pursuit of innovation by the firms. Firm pursues value innovation that enables it to embrace differentiation and low cost simultaneously. Innovation is critical to promoting productivity gains in the agro-food sector. Effective interaction, coordination, and collective action are based on existing capabilities, appropriate incentives, and the empowerment of individuals; thus they rely on voluntary action. Better-connected actors with stronger innovation capabilities help to solve coordination problems among potential partners, build trust for collaboration, build up innovation capabilities, and develop a better understanding of the needs and capabilities among listed agricultural firms. Innovation capabilities involve building and integrating internal and external resources to address problems or take advantage of opportunities. Enhancement might also involve adding new features, correcting identified defects and modifying functionality to enhance efficiency.

An enhanced system can replace an existing system in any of these three ways: a commercial off-the-shelf system, a new custom-built system or a hybrid of the two. System development enhancement is most commonly implemented to cut costs, improve performance, and meet regulatory requirements or to take advantage of modern technologies.

Participant 5 indicated that “identified defects are corrected on a continuous basis. If not, the users will not be used to users”. Participant 3 from Eaagads noted, that “Identified defects are corrected on continual basis. You cannot continue with defects as these may negatively affect product and service delivery of the firm”. Innovation serves as a means of creating new business that is capped with superior control mechanisms, value addition and risk reduction. Many innovations are derived from other input sectors and thus are incorporated in machinery, processing and packaging. By identifying and correcting defects, quality of products produced is enhanced. According to Chesbrough (2010) the effects of innovation were reflected in increased range of goods and services, improved quality of goods and services, and process-oriented outcomes such as improved production flexibility and increased production capacity. Moreover, the findings of the study were in agreement with those of Kash and Rycroft (2011) who stipulated that system development enhancement is most commonly implemented to cut costs, improve performance, meet regulatory requirements or to take advantage of modern technologies.

Participant 4 from Limuru Tea noted that “the firm has an established intranet and extranet to pass information between and among various department and “.functional units. Partciapnt3 indicated, “The firm has a strong and robust intranet to digitally communicate with our customers. The intranet and extranet connection in the firm

facilitates the connection of work station to the headquarters”. Intranet and extranet link employees working in different locations by allowing them enable them communicate effectively. The results agree with Gerstenfield and Wortzel (2007) that internet-based innovation technologies are significant in enabling innovation and profitability.

Participant 1 from Kapchorua Tea noted that their “firm does not have efficient human resource management system”. Participant 2 also retorted that “the firm does not have effective human resource management system.” Participant also indicated that “there is no human resource management system in the firm. The firm does manual management of human resource management system.” There is a link between human resource management system and competitive advantage in any firm through its role in shaping the skills and motivation of employees. human resource management system positive influence firm performance through implementing and supporting organizational policies and procedures that serve to positively motivate workers (e.g. reasonable incentive compensation and rewards, fair grievance procedures, and performance management), and learning and development activities that stimulate optimal task and contextual job performance.

Participant 2 from Kakuzi noted that “the firm doesn’t have customer relationship management. Participant 5 added that “they do not have Customer Relationship Management System. The firm is purely export oriented and purely depends on contractual terms written.” Customer relationship management tools help organizations manage relationships with customers systematically, efficiently and profitably. Customer Relationship Management is an integrated approach in identifying, acquiring and retaining customers by enabling organizations to manage and coordinate customer interactions according to multiple channels, departments, lines of business and

geographies, CRM helps organizations maximize the value of every customer interaction and drive superior corporate performance. CRM is considered as a comprehensive strategy and process of acquiring, retaining, and partnering with selective customers to create superior value for the company and the customer. CRM involves business process change and the introduction of new technology. The objective of CRM process is to form customers' perceptions of an organization and its products through identifying customers, creating customer knowledge, and building customers relationship. The implementation of CRM may enable an organization to attain and sustain firm's competitive advantage hence firm growth.

Participant 5, indicated that “the firm has no Radio Frequency Identification systems.” Participant 4 from Limuru Tea noted that “Limuru Tea Limited is in the process of acquiring Radio Frequency Identification systems to improve business operational management.” Radio Frequency Identification systems facilitates the transmission of data by a device that is portable and known as ‘tag’ which is read by the reader and it processed by the different applications according to their needs. Radio Frequency Identification systems provides information about location or identification and about specifications such as color, price, product tag and purchasing date.

RFID is an automatic identification technology that uses radio waves to uniquely track individual objects including items, animals, or even humans. This technology can identify, categorize, and manage the flow of goods and information throughout a supply chain. It offers the potential to greatly improve firm performance due to its ability to provide rich and timely information that increases visibility and control over the supply chain.

Tracking the assets RFID technology is mostly being used by the companies for tracking their assets, due to the fear of stolen and theft. Also be used for the incoming and outgoing assets so that they can keep the records. It can use in the agricultural firm so that product can be safely moved from one department to another. This technology is being used in supply chain that is close-loops, either in departments of the single organization or in total supply chain. RFID has ability that it can influence the efficiency as well as the effectiveness of supply chain; production. Radio Frequency Identification (RFID) technology offers the potential to greatly improve supply chain performance due to its ability to provide rich and timely information that increases visibility and control over the supply chain, improved lot tracking, better recall management and streamlined shipping and receiving.

Participant 5 from Saini Tea noted that “The firm has an automated storage and retriever system to store critical and confidential information of the firm.” Storage systems are an essential component of every organization management. The main functions of storage systems are to put materials into storage, then holding the materials in fixed position inside the storage system and finally remove materials from storage and are often called order picking.

Participant 3 said that “there is huge storage space to keep firm’s records.” A storage system should aim at smooth functioning of the whole enterprise, perfect coordination between different functionaries in the department as well as between other department in the organization, avoidance of all types of delays, wastages and spoilage, reduction of operational cost at all levels including in time and effort in the accomplishment of a job and it should also aim in separating purchasing functions from the materials organization.

Respondent 2 from Kakuzi indicated that “the firm has an established geographical information system (GIS). The firm uses GIS to map land.” Participant 1 also indicated, “Kapchorua Tea has an established geographical information system to map land under cultivation, identify land parcels that pruning, picking or plucking.” “There is also Electronic Data Interchange used with the banks. There is continuous interaction between departments. This allows efficient flow of information in the firm. Collaboration is also encouraged in the firm in order to improve firm’s efficiency.” Participant 3. Participant 5 noted, “There is continuous interaction between various departments. The flow of information between departments is smooth. Collaboration among functional units of the firm are always encouraged.” In multi-functional firms where separate departments collaborate to produce a perfect coordination in design, assembled product, technical and production capabilities are critical in ensuring that final product meets the standards. Thus, proper integration is a vital management obligation which balances decentralization and centralization of operational efficiency within the entire group which enables different participants to homogeneously function and coordinate energies to attain the goals of an organization.

The second objective was to establish the effect of innovations on performance of agricultural firms listed at the Nairobi Securities Exchange. Participant 5 from Saini Tea noted, “System development systems have helped reduced paper work. It has also helped boost operational efficiency of the firm. Participant 2 indicated, “Information system has allowed good use of time. It has also improved resource mobilization and management.” Firm that are keen on enhancing their growth, market entry, increasing their existing market share and craft a sustainable competitive edge have to embrace a holistic approach to innovation. Innovation is the creation of growth strategies, new product categories, services or business models that change the market and generate significant new value for consumers, customers and firm. The findings of the study were in agreement with those of Kash and Rycroft (2011) who posited that system development enhancement is most commonly implemented to cut costs, improve performance, meet regulatory requirements or to take advantage of modern technologies.

Innovativeness portrays organizational willingness and a tendency to achieve the desired innovation demonstrated in terms of behaviors, strategies, activities and processes. As a consequence, innovativeness usually result in new products and services or changes in service/product lines, new methods of production, developing new systems/applications or introducing as well as implementing new procedures. Moreover, the findings of the study were in agreement with those of Alstrup (2010) who argued that, while digital tools and services require an initial resource investments, this kind of investment can bring long run efficiency by streamlining processes and saving time. Consequently, digital tools can also open up new avenues for exchange of data and collaboration (Kash & Rycroft, 2011).

Accordingly, the impact of organizational innovativeness on its performance depends on the degree of innovation that is being pursued. It has been argued that more substantial and radical types of innovation tend to have a significant impact on organizational overall performance, while incremental innovation seems to have a low and short term impacts because such innovation usually concentrate on minor or process improvement initiatives or activities. Agricultural innovation is a catalyst for growth and change, and that fostering innovation is vital for meeting the challenges of agriculture and development of the sector. a firm needs a capability to innovate, the more firms invest in their technological capability, the greater its performance should be. The findings of the study were in agreement with those of Wu and Lin (2009) who stipulated that information technology based innovations are significant to enable a firm(s) survives severe and tough universal circumstances but maintaining sustainable competitiveness.

The findings of this study are in tandem with those of the resource based view theory. According to Wagner (2006), the hypothesis contends that technological innovations are defined as the desirable practices acquired from efficient technologies. Desirable practices will support the technological functions in the delivery of services of high quality and sustain superior performance therefore technological innovation frameworks are resources that fall well within RBV because it leads to improved service delivery and performance.

This study is of the view that higher level of bonding between technological innovations and sustainability is directly associated with an organization's performance and profitability. Under the RBV theory, by exploiting technological innovation practices, manufacturing firms build capabilities for improved organizational performance. This

theory is relevant to the study because it recognizes organizational processes, knowledge sharing and close working relationships as resources that can be used to improve the performance of organizations.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5:1 Introduction

The study was undertaken with the aim of in to determine the effect of innovations on performance of agricultural firms listed at the Nairobi Securities Exchange. This chapter summarizes the research findings, conclusion, recommendation for policy and practice, limitations of the study and suggestions for further study.

5.2 Summary of the findings

The study employed qualitative research design. Data was gathered using an interview guide. Managers of agricultural firms listed at the NSE or their representatives participated in the study. The conversation during the interview was transcribed.

There exist a positive relationship between technological capability and firm growth. Emphasis to technological change has been given as a component for the technological capability. Skills, knowledge and experience are required to operate existing systems and to generate technical change from the technological capability. Effective interaction, coordination, and collective action are based on existing capabilities, appropriate incentives, and the empowerment of individuals; thus they rely on voluntary action. Better-connected actors with stronger innovation capabilities help to solve coordination problems among potential partners, build trust for collaboration, build up innovation capabilities, and develop a better understanding of the needs and capabilities among listed agricultural firms.

The identification of defects is done on a continuous basis. Disregarding may negatively affect product and service delivery of the firm. Innovation serves as a means of creating

new business that is capped with superior control mechanisms, value addition and risk reduction. Many innovations are derived from other input sectors and thus are incorporated in machinery, processing and packaging. By identifying and correcting defects, quality of products produced is enhanced.

Agricultural firms listed at the Nairobi Securities Exchange have an established intranet and extranet to pass information between and among various department and functional units. The intranet and extranet connection in the firm facilitates the connection of work station to the headquarters. Intranet and extranet link employees working in different locations by allowing them enable them communicate effectively.

The study established that some of agricultural firms listed at the Nairobi Securities Exchange did not have human resource management system. There is a link between human resource management system and competitive advantage in any firm through its role in shaping the skills and motivation of employees. Human resource management system positively influences firm performance through implementing and supporting organizational policies and procedures.

It was further noted that some agricultural firms listed did not have Customer Relationship Management System. Some firms purely export oriented and purely depends on contractual terms written. Customer relationship management tools help organizations manage relationships with customers systematically, efficiently and profitably.

Some of agricultural listed firm did not have Radio Frequency Identification systems. Other firms were in the process of acquiring this technology innovation. RFID is an automatic identification technology that uses radio waves to uniquely track individual

objects including items, animals, or even humans. This technology can identify, categorize, and manage the flow of goods and information in an organization. It offers the potential to greatly improve firm performance due to its ability to provide rich and timely information among different functionalities of a firm.

The firms had employed GIS to map land. For instance Kapchorua Tea has an established geographical information system to map land under cultivation, identify land parcels that pruning, picking or plucking. There is also Electronic Data Interchange used with the banks. This allows efficient flow of information in the firm. Collaboration is also encouraged in the firm in order to improve firm's efficiency. In multi-functional firms where separate departments collaborate to produce a perfect coordination in design, assembled product, technical and production capabilities are critical in ensuring that final product meets the standards. Thus, proper integration is a vital management obligation which balances decentralization and centralization of operational efficiency within the entire group which enables different participants to homogeneously function and coordinate energies to attain the goals of an organization.

System development systems have helped reduced paper work. It has also helped boost operational efficiency of the firm. Information system has allowed good use of time. It has also improved resource mobilization and management. Firm that are keen on enhancing their growth, market entry, increasing their existing market share and craft a sustainable competitive.

5.3 Conclusion

From the study findings, the study concludes that the performance of agricultural firms listed at the Nairobi Securities Exchange affected by system development enhancement, digital tools and services, information technology based innovations and interdepartmental process integration. The study found that system development enhancement can enhance the performance of agricultural firms listed at the Nairobi Securities Exchange. The study therefore concludes that an improvement in system development enhancement would lead to improved performance of agricultural firms listed at the Nairobi Securities Exchange.

The study concludes that digital tools and services have an effect on the performance of agricultural firms listed at the Nairobi Securities Exchange.

It was also concluded that interdepartmental process integration affects performance of agricultural firms listed at the Nairobi Securities Exchange.

Finally, the study concludes that the independent variables selected for this study that include system development enhancement, digital tools and services, information technology based innovations and interdepartmental process integration influences the performance of agricultural firms listed at the Nairobi Securities Exchange.

5.4 Recommendations of the Study

Agricultural firms listed at NSE should develop products to meet market demand; improve the quality and added value of the agricultural products; these firms should enhance the technological innovation capability and financial strength. Financial strength is the foundation of the creation and operation of firms. Technological innovation is relied on by survival and development of firms. Agricultural listed firms

should establish cooperation relationship with scientific research institutions to get the support in the development and promotion of new varieties. Organizational innovation and process innovation are more important factors affecting innovative performance and firm performance than product and marketing innovation. Therefore, agricultural firms listed at NSE should focus and mobilize resources to create improvement in organizational structure and manufacturing processes.

Because innovative performances are strongly impacted from organizational innovation and process innovation activities, agricultural firms listed at NSE should focus on enhancing firm innovation and process innovation. Enterprises should also create a creative environment inside themselves to encourage innovation through programs, awarding feasible creativities.

The study established that digital tools and services affect performance of agricultural firms listed at the Nairobi Securities Exchange. Digital tool services are important when digitizing government services. Digital tools and services are used to support business operations, from electronic commerce, to firm communications and to internal business systems. This study recommends more funding to such departments.

Information technology based innovations affects performance of agricultural firms listed at the Nairobi Securities Exchange. Information technology based innovations are important to assist firms in surviving adverse global financial conditions while also becoming instrumental for generating sustainable competitiveness. This study recommends more funding to research and development.

It was also established that interdepartmental process integration affects performance of agricultural firms listed at the Nairobi Securities Exchange. Good integration

becomes a critical management obligation so as to balance centralization and decentralization for operational efficiency within the whole group which enables people with different roles to homogeneously function and coordinate efforts to achieve an organization's goals. Interdepartmental process integration defines overall goals and departmental sub-goals so that everyone clearly understands their roles and how these contribute to realizing overall objectives. This study recommends integration of key government entities through technology adoption.

5.5 Limitations of the Study

Some of the respondents were unwilling to participate in the study. However, this was mitigated by assuring them of confidentiality and that the data collected was meant for the purposes of academic research only.

The study relied much on qualitative data is depended on personal opinion. However, the study requested the respondents to be truthful as much as possible.

5.6 Suggestions for Future Research

The study used the qualitative research method. The use of interview guide was quite limited. There was a need to complement it whether a questionnaire. Further research can combine a questionnaire and in interview guide to measure the effect of innovations on performance of agricultural firms listed at the Nairobi Securities Exchange.

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APPENDICES

Appendix I: Letter of Introduction

University of Nairobi

School of Business

P. O. Box 30197

Nairobi

Dear Sir/ Madam,

RE: REQUEST FOR PARTICIPATION IN RESEARCH

I am post graduate student from University of Nairobi in pursuance of MBA in Strategic Management. I am completing a study on the effect of technological innovations on organizational performance of agricultural firms listed at the NSE.

I kindly request you to assist me collect data from the corporation. The data given will be utilized purely for the study purpose and will be held in strict confidentiality.

Yours faithfully,

Veronica Waweru

Appendix II: Interview Guide

I would like to request you to give me information on the effect of technological innovations on organization performance of agricultural firms listed at the Nairobi Securities Exchange.

The purpose of this interview is to:

- i) Determine the level of technological innovations adoption among agricultural firms listed at the NSE.
- ii) Establish the effect of technological innovations adoption on organizational performance of agricultural firms listed at the NSE

PART A: MANAGER OR REPRESENTATIVE PROFILE

- 1) What is your current position in the firm?
- 2) What is your highest qualification?
- 3) For how long have you been in senior level management of the firm?
- 4) Are you involved in technological innovations of the firm?

PART B: LEVEL OF INNOVATIONS AMONG AGRICULTURAL FIRMS LISTED AT THE NSE

Section 1: System development enhancement

- 5) In your view, does the firm frequently add new capabilities to the existing system?
- 6) In your view, can you conclude that identified defects are corrected on a continuous basis?

Section 2: Digital tools and services

- 7) Is the organization connected with an intranet? How about an extranet?
- 8) In your view, does the firm have an efficient human resource management system?
How about an efficient customer relationships management system?

Section 3: Information technology based innovations

- 9) Does your organization make use of radio frequency identification systems (RFID)? How about an automated storage and retrieval system?
- 10) Does the organization make use of global positioning systems? Is electronic data interchange widely practiced?

Section 4: Interdepartmental process integration

- 10) In your own view, can you conclude that there is continuous interaction between departments? How about efficient flow of information between functions and departments?
- 11) In your own view, can you conclude that collaboration between departments is encouraged in the organization?

PART C: INNOVATIONS AND ORGANIZATION PERFORMANCE

- 12) In what ways do you think system development enhancement improves organization performance?
- 13) Does use of digital tools and services impact on organization performance? If yes, in what ways?
- 14) What are some of the ways through which technological based innovations impact on organization performance?

15) In what ways do you think interdepartmental process integration impacts on organization performance?

Thank you for your co-operation

Appendix III: List of Agricultural Firms Listed at the Nairobi Securities Exchange

Eaagads Ltd

Kapchorua Tea Co. Ltd

Kakuzi Ltd

Limuru Tea Co. Ltd

Rea Vipingo Plantations Ltd

Sasini Ltd

Williamson Tea Kenya Ltd