

**TECHNOLOGY BASED STRATEGIES AND COMPETITIVENESS OF
SELECTED MULTINATIONAL TEA COMPANIES IN KERICHO AND
BOMET COUNTIES, KENYA**

DORNAH CHERONO BOR


D53/KER/PT/33342/2014

**A RESEARCH PROJECT SUBMITTED TO THE SCHOOL OF BUSINESS IN
PARTIAL FULFILLMENT FOR THE REQUIREMENTS OF THE DEGREE
OF MASTER OF BUSINESS ADMINISTRATION (STRATEGIC
MANAGEMENT OPTION) OF KENYATTA UNIVERSITY**

OCTOBER 2020

DECLARATION

This research project is my original work and has not been presented for a degree or other award in any university.

Signature  Date 21/10/2020

Dornah Cheron Bor

D53/KER/PT/33342/2014

I confirm that the work reported in this research project was carried out by the candidate with my approval as the University Supervisor.

Signature  Date 21/10/2020

Dr. Kipkorir Sitienei Chris Simon,

Department of Business Administration,

School of Business,

Kenyatta University

DEDICATION

I am dedicating this research project to all my siblings, nieces and nephews. Special dedications to my parents Mr. & Mrs. Alexander & Sally Bor.

ACKNOWLEDGMENTS

With great appreciation, I acknowledge Dr. Kipkorir Sitienei Chris Simon for his academic support and guidance. I wish to acknowledge Emily Cheruiyot for her relentless support. My gratitude extends to the entire Kenyatta University fraternity. I am grateful to Alexander Bor & Selly Bor for their invaluable support, both morally and financially. Most of all, I am thankful to God for His constant favors and blessings.

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OPERATIONAL DEFINITION OF TERMS

- Competitiveness:** Art of corporations being on the cutting edge in matters productivity, cost, safety and production, so as to stay ahead of other countries offering the same goods and services.
- Graded staff:** Employees with special training and skills of operation in specific department.
- Industrialization:** Job creation firms and sectors, such as, Juakali, manufacturing firms/factories and SMEs
- Multinational Corporation:** Corporations which produces or sells goods or services in various countries.
- Smallholder tea farmers:** Farmers who own 0.5 to 2 acres of land under tea.
- Social amenities:** Facilities like schools, hospitals and housing that contribute to physical or material comfort.
- Technology:** Purposeful application of information in the design, production, utilization of goods and in the organization of human activities.
- Technology advancements:** Solar lighting, portable toilets, mobile systems, ICT, affordable building materials e.g. prefab houses, interlocking bricks etc. in Kericho Municipality.

Technology based strategies: Advances put in place to assist in planting, harvesting, cutting and input application, which are technology driven by the use of information technology at some instances.

Transport systems: These include road networks, drainage systems, and electricity lines available in multinational tea companies' establishment.

ABBREVIATIONS AND ACRONYMS

BSC	Balanced Score Card
ICT	Information and Communication Technology
JFK	James Finlay Kenya
KHRC	Kenya Human Rights Commission
KTDA	Kenya Tea Development Agency
KTGA	Kenya Tea Growers Association
MLR	Multiple Linear Regression
MNCs	Multinational Corporations
PROUT	Progressive Utilization Theory
RBV	Resource Based View
SPSS	Statistical Package of Social Sciences
TBK	Tea Board of Kenya
TRFK	Tea Research Foundation of Kenya
UTK	Unilever Tea Kenya

ABSTRACT

Multinational Corporations are an important part of the economic development in the world with Kenya benefiting from such corporations as they form a larger part of the foreign exchange earner and also provide employment to its populace. They play a very important role in our lives hence boosting the whole world economy in very significant ways, but there is always a problem of competitiveness because of cost, productivity, safety and production levels. Multinational Corporations are not just regular organizations as they are involved in a range of activities from extraction of raw materials to processing and in most cases, technology-based production process. The latter is where the current world is so much focused on as it turns out to involve technological advancements. However expensive it is, most companies are engaging in it as the edge out in the competition. Multinational firms send a package of capital, technology, managerial talent, and marketing to carry out production in foreign countries and their production is authentic worldwide. The current study investigated the effect of technology-based strategies on competitiveness of Multinational Tea Companies in Kericho and Bomet Counties, Kenya. The specific objectives were to analyze the effect of planting, tea harvesting, cutting and input application strategies on competitiveness. The study is therefore important to all the managers as it gives insights in understanding how the specific implemented strategies affects the business in terms of performance and gives direction on how to maintain its optimum firm competitiveness. The Study used three theories; Labor Theory of Value, Resource Based Theory and The Balanced Scorecard Model. The study targeted the management staff, supervisors and support staff, totaling 135. The study used purposive sampling technique to select companies that have technology based strategies. Simple random sampling techniques were used within the strata to achieve the sample size. The study used questionnaires to collect data from the respondents. To ensure validity of the questionnaire, the researcher used face validity and content validity and the reliability of the research instruments was computed using Cronbach's alpha coefficient of internal consistency. The quantitative data was analyzed using descriptive statistics generated with the aid of Statistical Software of Social Sciences (SPSS) and the qualitative data was analyzed using content analysis. Graphs, charts, and tables were used to present data. The study found out that mechanical planting has improved productivity of workers, and enhanced plant survival due to standardized plant handling. Mechanical harvesting strategies have enabled the organizations to cut down on production costs and remain in operation while improving employee earnings. The findings showed that cutting strategies allowed the companies to reduce employee exposure to danger hence reducing safety incidences, while saving on labour costs. In conclusion, though expensive, input application strategies are more preferred by companies as they are more efficient and productive ways that improve plant survival and crop yields. The study concluded that adoption of mechanized operational strategies is highly recommended as they play a positive role in production efficiency and resource utilization hence placing the companies in the competitive edge of the market. The researcher recommends introduction of government policies protecting mechanization in agricultural multinationals and welfare of the communities they operate in, clear manpower-machinery replacement policies for new technologies and a further research study to analyze the effect of government restrictions on competitiveness of the MNCs.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Overtime, tea companies have seen an increase in demand for tea which has forced the many to expand their production in an effort to meet customer demands. Consequently, multinationals have moved towards adopting new technologies, which is mostly still under small scale and trial basis, in an effort to maintain their competitiveness in the industry. Crop husbandry constitutes a higher percentage of manual operations in plantations.

Odhiambo (2015) argues that some forces of change that have influenced the tea industry in Kenya include intensive competition, globalization and technological advancement which have forced tea companies to re-craft their strategies in the effort to remain competitive. Tea harvesting operations alone accounts for about 70% of the workdays on an estate which translates to approximately 40% of the total cost of production. The expansions in tea plantations, requires a lot of manual labour as the seedlings need to be handled with utmost care. Other activities in tea production include maintenance, pruning, among other tea agronomic practices; all this requiring labor.

In tea harvesting, however some areas are being harvested with machinery, a bigger part of it is still under manual plucking especially the younger/immature tea that cannot be harvested by the heavy machinery in place. Tea pruning is also a compulsory part of tea crop husbandry circle, so is input application. These sensitive activities require extensive labour for them to be accomplished and have led to continued higher cost of production. Some tea companies have however been making

effort to advance into new mechanized methods of application but the costs, the resistance from employees and the high safety concerns still remain a major problem in which the company still battles with it in the effort to remain competitive. Despite the technology advancements, the high labour requirements, low productivity and the high maintenance and overhead costs have made it difficult for the multinational tea companies to keep up with the ever-changing competitive environment.

Due to the economic globalization, the product and the market expansions imply that the research development of an enterprise need to be equipped with better present technology-based strategies, as technology continuously substitute development. In recent years, American, Japanese, European multinational corporations realized that the technological strategy of a company shouldn't be "self-sufficient", rather they should embrace the "surpassing type" (Sun, 2009). Multinational corporations which operate in host country devolve some of its technology in form of product, production process, and organization, which largely incorporate suppliers of MNCs within the locality. These days, getting a buy in from a multinational is a sure means of gaining technology. This may happen through agreements between MNC and recipient for the devolvement of particular technologies, or through passing on skills, experiences, and knowledge through partnering for practical support, services or expertise and employee movements and project agreements (UNCTC, 1994).

Reports by PricewaterhouseCoopers of 2010 indicated that there is a great potential for technology to create new markets, increase variety of choice and accelerate service and product delivery. With E-commerce, there is potential to revolutionize retail. Multinational organization which deals with production of flowers, tea and eucalyptus trees are normally the most profitable organization in Kenya. Tea is one of

the leading foreign exchange earners in Kenya. While multinational tea companies operate in unfamiliar environmental aspects (Martin, 2012), highly competing multinationals with presence of other Kenyan tea traders demand need for strategies which promise competitiveness. The success of multinational corporations has largely been related to its ability to successfully apply several strategies like diversification, vertical integration, innovation and certification (Kiplangat, 2012).

Competitive strategies involve a range of strategic options which multinational tea companies embrace when dealing with competition, overcoming competition or staying aloof of competitors (Martin, 2012). However, formulation of competitive strategies is the core part of strategic management which is key for organizational long-term existence. Over the earlier years, multinational tea companies have benefited from a growing share of income from participating in international markets. Globalization allows expansion of operations into new geographical areas. This creates opportunities to grow revenue. Through economies of scale and scope, globalization also leads to cost reduction and rise in profits. Through globalization, multinationals are presented with strategic opportunities that purely domestic firms cannot access. Such opportunities include diverse input acquisition ability (Bakan, 2004).

Multinational Corporations harnessing technology can make their operations global to achieve foreign incomes by way of local responsiveness and configuration and coordination of value chain (Palvia, 1997). Technology facilitates value chain synchronization and flow of knowledge by providing high quality transfer and consumption of knowledge across the value chain. Multinational corporations adopt a number of the technology-based strategies in their production process, for tea

companies, these include planting, harvesting, pruning and input application strategies. This study analyzes competitiveness of multinational tea companies, Kericho and Bomet counties, in relation to the adoption of these technologies-based strategies and how the organization has positioned itself on the global market in face of fierce competition from tea producing organizations. These multinational tea companies include; Unilever Tea (K) Limited, James Finlays (K) Limited, Williamson Tea and Sotik Tea.

1.1.1 Competitiveness

Competitiveness is a process in which corporation in countries stay on the cutting edge in matters productivity, cost, safety and production, with the help of technology. An empirical analysis by Rugman, Hoon, and Lim (2011) suggests that however much of this competitiveness is being achieved within their home regions; world's largest 500 firms have raised their firm-level competitiveness internationally with the adoption of cutting-edge technology. That is to say, international competitiveness does not constitute a global and regional phenomenon, but is dictated by the amount of technology a corporation invests in. Scott and Lodge (1985), move the focus of competitiveness to the country level proposing that competitiveness is a "country's ability to create, produce, distributes and/or service products in international trade while earning rising returns on its resources." For the OECD (1992), "competitiveness is the degree to which a nation can, under free trade and fair market conditions, produce goods and services which meet the test of international markets, while simultaneously maintaining and expanding the real income of its people over the long-term."

According to Karl (2013) competitiveness is the ability of an organization to deliver beyond its industry competition. Competitiveness is simply the ability to compete. Kenyan tea industry has been experiencing price falls over the past few years due to economic instabilities, poor demand and erratic weather conditions. This has led to upward rising costs of production and low profit margins by the producer firms. Kericho being one of the major tea producing regions in Kenya has seen some of its major tea companies adopt mechanized tea production systems e.g. the use of mechanical planting and harvesting machines, mechanical tea pruning etc. in an attempt to mitigate the rising production costs and stiff competition, therefore ensuring sustained business and firm survival.

Competitiveness is a problem globally, regionally and nationally. In this study, competitiveness was assessed on a national level and was conceptualized in terms of cost, productivity, safety and production.

1.1.2 Technology Based Strategies

Technology has two basic components: ‘knowledge’ or technique; and ‘doing things’. It is connected with ways of getting results, resolving issues, accomplishing tasks using special skills and knowledge together with asset exploitation (Lan & Young, 1996). Technology not only relates product representation but also the knowledge or information of the product’s use, application and the process of developing it (Lovell, 1998; Bozeman, 2000).

As stated by Rothaermel (2008), strategy refers to the ideas, plans, and support those firms employ to compete successfully against their rivals. It is an organization’s action plan as a way of preparedness to an anticipated change or as a response to its external environmental changes. Strategy is designed to transform the firm from the

present position to the new position described by objectives, subject to constraints of the capabilities or the potential (Kaplan, 2005). A strategy of a firm is therefore a management plan of how to gain and sustain competitive advantage that will enable them to cope with competition.

A Technology based strategy is therefore an overall plan which consists of objective(s), principles and tactics relating to use of the technologies within a particular organization; focusing on technology and people. The wave of innovation adoption within tea organizations throughout the years has been driven by strategies that have opened economies locally and universally. Advances in innovation exert pressure on human asset capacity to adjust to changing organizational needs and add greater worth. It is driven by a few variables which include: accelerated production, expanded portability of products, the progression of capital business sectors, and the worldwide harmonization of the administrative condition. The transfer and adoption of technology in the tea sector is of fundamental significance to guaranteeing a solid flexibility of top-notch products at costs that are both beneficial to producers and sensible to shoppers. Tea firms are embracing new technology through implementation of planting strategy, tea harvesting strategy, cutting strategy and input application

1.1.3 Multinational Tea companies

Multinational tea companies have been cultivating tea crops for more than ninety years in Kericho and Bomet counties which are among the largest tea growing regions in Kenya. These firms employ over 40,000 people making them the biggest national agribusiness employers and investors (Leo, 2017). The tea industry is currently facing a series of challenges which threaten its viability both now and, in future. These can

be categorized as environmental, economic and social. Erratic weather conditions have contributed to big losses in costs of managing estate operations. With the recent drought effect, these multinational tea companies have been forced to close down some lines of operations in order to lower production costs. However, the problem has been maintaining the permanent employees who despite insufficient work, have to be paid, as others resisted technology as they see it as a way of driving them out of employment.

Increased competition from lower cost production centers and the downturn of the economy in the recent past has hugely affected sales volumes in a negative way. While technologies which have been adopted have come with a number of safety concerns, some are still on trial basis since they require skilled personnel to manage and operate them. Multinational tea companies have had to bear the cost of training and recruiting experts for such operations. Recognizing that all these are systemic problems which no one company can resolve on its own, multinational tea companies along with a number of other like-minded businesses, have joined together with Forum for the Future in a project called Tea 2030 which seeks to address these issues and find solutions designed to ensure that tea has a sustainable future.

Overtime, the innovation strategy of a company requires to be adjusted (Davila, 2006). Choice of innovation strategy can be affected by several factors both internal and external. Value created through innovation can vary from progressive improvements of existing products, formation of completely new products and services, to reduction of costs, etc. In order to keep up with the rapid market changes, an enterprise must innovate effectively (Ongong'a & Ochieng, 2013). Such effective methods as adopted by multinationals include partnering to share heavy costs of

implementation as well as managing risks through research and development, customization and phase implementation.

A technological strategy must adapt to the outer condition which is complex and ever evolving. This is because there is considerable amount of uncertainties about current or future developments in terms of technology, competitive threats and market demands. The best technological strategy for a particular firm and the success of a given innovative strategy will depend on the effort extended to align innovation with strategy and management of the entire process with discipline and transparency. This implies that administration assumes a key function in guaranteeing the achievement of a given advancement system and without their help, there are restricted odds of progress. Technology based strategies can likewise help entrepreneurs downplay costs. The utilization of mechanization in planting, harvesting, cutting, and input application can help corporations diminish its reliance on individuals to play out a portion of the vital creation measures. Accordingly, the business can decrease worker costs, for example, pay, advantages, and turnover, and furthermore help to smooth out the production cycle. So as to maintain a strategic distance from obsolesce and advance development, multinational companies must know about innovative changes that may impact its industry. This is on the grounds that imaginative mechanical developments can propose opportunities for new items, upgrades in assembling or promoting procedures. Innovation has become a twofold edged blade since it has encouraged advancements and it has also provided chances for future enhancements. Employments of development and innovation empower firms to associate and draw in with their partners in new and fundamentally quicker and less expensive ways. Innovation empowers firms to approach significant assets without fundamentally claiming them through business measures re-appropriating. However during the time

spent associating and drawing in the partners, employments of development has present new interdependencies that if inappropriately overseen can prompt expensive and wasteful activities and can at last decrease readiness and hurt execution of a corporation.

1.2 Statement of the Problem

Multinational tea companies operate in large scale. One of the areas of concern is the cost of production. Multinational tea companies have in the recent past been forced to close a tea factory in Kericho to reduce maintenance costs by focusing resources in a more productive area hence utilizing its competitive advantage. According to national news report of 2009, James Finlays Kenya (JFK) announced the closing down of one of its factories (Mara Mara) in Kericho. As part of a strategy to maintain global market competitiveness, the company had put in place plans to expand another one of its factories (Saosa), in the same area.

Another area of concern is the level of productivity as this affects the competitiveness of an organization. Overall cost of production is largely contributed by cost of labour used. A comparative study of the tea sector in Kenya; a case study of large scale tea estates, KHRC, 2008 puts this into perspective. The study indicates that Unilever submitted a presentation which showed that from 1996 to 1997, the industry wage costs were in conformity to the rise in inflation but the variance between inflation rates and rising labour costs had grown disproportionately since 1998. In general, from 1996 to 2007, there had been about 175 per cent rise in wages and yet the rate of inflation had only grown to an approximate 70 per cent. Finlays and Unilever managing teams and the Chair of KTGA noted that the increasing wages were exclusive to Kenya due to \$3 per day demand from workers unlike in other countries

such as Malawi, India and Sri Lanka where the daily wage per worker was less than a \$1. With these in mind, what are the strategies that are in place in such organizations to mitigate such negative effects while remaining competitive?

Competitiveness is also affected by the level of exposure of employees to unsafe conditions. Little has been researched on technology-based strategies that multinational tea companies have adopted to reduce employee exposure to unsafe conditions.

Input application strategies affect crop production levels which also affects competitiveness of an organization. A qualitative study by Owour, Kavio and Siele, (2001) on extension service knowledge and farm adoption levels indicated that technology of applying fertilizer improved crop yields. But how does the mode of input application affect the yield? To what extent have the new technologies so far adopted been of assistance to the companies and what effect do they have in productivity, cost, safety and production levels? The literature available on adopted new technologies is scanty and little research has been done. The current study therefore aimed at assessing the effect of technology based strategies on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya.

1.3 Objectives of the study

The study was guided by the general objective and the specific objectives.

1.3.1 General Objective

To determine the effect of technology-based strategies on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya.

1.3.2 Specific Objectives

- i. To investigate the effect of planting strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya.
- ii. To determine the effect of tea harvesting strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya.
- iii. To analyze the effect of cutting strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya.
- iv. To assess the effect of input application strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya.

1.4 Research Questions

- i. What is the effect of planting strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya?
- ii. What is the effect of tea harvesting strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya?
- iii. What is the effect of cutting strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya?
- iv. What is the effect of input application strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya?

1.5 Significance of the study

The findings from the study are considered useful to the selected organizations as a basis of review of phases of technological advancement and the role that each of the adopted technology has played in positioning the organization at its competitive edge. Findings indicate that mechanized planting output is moderately high and that use of machines in planting tea has significantly improved productivity while somehow influencing the plant survival rate. Planting strategies had high influence on competitiveness. Also, harvesting strategies play a crucial role in competitiveness. With mechanical harvesting, less people harvest a bigger unit of area, harvest more kilos of tea that despite the low rate of earning per kg in mechanical compared manual harvesting, the total earnings per person remains higher than manual harvesting. On cutting strategies, findings indicate that mechanical tea pruning machines have influenced the number of reported cases of accidents during pruning operation, productivity and output per day. With mechanical tea pruning, less annual lost time accidents have been reported and less man days are required to complete a unit area compared to when manual tea pruning was used. Competitiveness is therefore a crucial function of cutting strategies. Competitiveness is also directed by the input applications strategies. Findings indicate that although aerial fertilizer application and lime application are expensive strategies, the modes of applications are more standard and guarantee better crop yields.

The research findings will also benefit the scholar/researcher to broaden the knowledge of the extent of technological adaptation in the tea industry through the study. The findings may also be assistance to other scholars as a reference during future academic researches.

This study researched on how the adopted planting strategies, harvesting strategies, cutting strategies and input application strategies contributed to the competitiveness of selected multinational tea companies in Kericho and Bomet Counties. Findings indicate that when all the other variables are kept constant, a unit change in planting strategy produces a decrease of 0.137 units in competitiveness of an organization, while a unit change in harvesting strategy produces an increase of 0.094 units in competitiveness of an organization, other factors remaining constant. A unit change in cutting strategy produces an increase of 0.377 units in competitiveness of an organization, other factors held constant. A unit change in input application produces a decrease of 0.075 units in competitiveness of the organization, other factors held constant.

The selected multinational tea companies, may use findings from this research to improve their company profile and reports, and through Tea Board of Kenya (Directorate of Tea – Ministry of agriculture and Livestock), it may educate other tea firms and institutions on the roles of such technology based strategies by sharing best practices and in the process influencing the development and competitiveness of the entire tea industry. From the finding on the coefficients of the study, the Multinational companies should put more focus on harvesting strategy, cutting strategy and input application strategy, this will enable them to build a profile from that and a good one for that fact. Findings indicate that productivity levels, cost of production, number of safety incidences and production yields directly affect the competitiveness of an organization. A coefficient of determination (R-square) of 0.287, indicate that technology-based strategy explained 28.7% variation in competitiveness of the selected multinational tea companies in Kericho and Bomet Counties, Kenya.

Findings also indicate that planting, harvesting, cutting and input application strategies are all significant on the competitiveness of an organization.

1.6 Scope of the Study

The study was carried out in Unilever Tea Kenya Limited, James Finlay Kenya limited, George Williamson and Sotik Tea Companies, with an aim of obtaining information from the graded staff and the management staff in the firm. The reason for selecting these specific organizations for carrying out this research is due the fact that these are the organizations that have employed all the technology-based strategies. The research was conducted in 2018. Data was collected using open and close ended questionnaire.

1.7 Limitations of the study

Mechanization in multinationals seems to be a very sensitive topic. Managers were reluctant to share information where the study focused on one multinational. Researcher with authorization from the office of graduate studies amended the topic of research to accommodate four multinational companies. The researcher further sought authorization from National Commission for Science, Technology and Innovation and from Kericho and Bomet County Educational and Commissioners' offices allowing the researcher to collect data from the selected MNCs.

The methodology used by the researcher involved using a design which was both descriptive and causal-comparative. This was quite tedious to the researcher as the study had to anchor to the root cause and give a description on the same. The researcher ensured that this happened with free flow of information.

It was not easy getting hold of managers to provide feedback as they are always out and about the vast tea estates. Some would misplace the hard copies while some were just hard to find. Researcher designed an online copy of the form to be filled by managers and sent back on email.

Some respondents found it hard to understand the expectations from the questions asked during data collection. Part the problem being language barrier which affected the responses. The researcher translated the questions to the respondents who faced any difficulty in reading, understanding and answering the questions.

Some respondents were reluctant to give full and honest information due to inadequacy of information or company information confidentiality issues. The researcher informed them that any information they shared would be kept confidential and shall only be used for academic research purpose.

The study area normally experiences heavy downpours from midday almost daily, and given the vastness of tea estate establishments, it was difficult to move around the plantations in order to reach all the respondents. The researcher scheduled most of the research visits to morning hours when the rains have not started and when most of the workers and management were at their work stations.

Response rate from the school of graduate studies was slow which resulted in delayed data collection and analysis reports. The researcher kept in touch with graduate school and adjusted project calendar accordingly.

CHAPTER TWO

LITERATURE REVIEW

2.1 Theoretical Review

Theories are formulated to explain, predict and understand phenomena and, in many cases, to challenge and extend existing knowledge within the limits of critical bounding assumptions. The theoretical framework is the structure that can hold or support a theory of a research study. The theoretical framework introduces and describes the theory the theory that explains why the research probes under study exists. (Swanson, Richard A, 2013)

2.1.1 Labor Theory of Value

This theory was developed by David Ricardo in 1817 and was supported by Karl Marx in 1970. This theory states that production of all value in goods and services can be accounted for by the labor that goes into them. According to Ricardo, price is a result of certain quantities of human labor needed to produce certain quantities of finished products. Lekchman (2009) explains that for a pair of shirt to cost \$12 while a pair of socks to cost \$2, 6 times the man hours needed to make the socks have been used to make the shirt. For Ricardo, this theory analyses the varying value of prices for different commodities.

This theory is very relevant in every organization as it clearly illustrates the relationship between input in cost of production and the output margins; when one inputs a hard and extensive labour, the product cost is expected to be higher than those who do not apply the same labour intensity. Every organization must therefore strive to lower the cost of production for it to achieve high margins on returns through reasonable pricing. In labour theory of value, David Ricardo states that production of

all value in goods and services can be accounted for by the labor that goes into them (Lekachman, 2009). David Ricardo further explains that price results from varying amounts of manpower required to make various final products. This theory illustrates the relationship between input in cost of production and the output margins; when one inputs a hard and extensive labour, the product cost is expected to be higher than those who do not apply the same labour intensity. This theory only focuses on cost which is the dependent variable in study but not on productivity, safety and production levels. This study viewed that mechanization process that harness labour which will create the product, hence the planting, harvesting, cutting, and input application are the processes of labour that will see the product compete in the international market. This study reviewed the inputs in the production of tea to match it with the competitiveness of the corporations.

2.1.2 Resource-Based View Theory

The resource-based theory of the firm was proposed by Wernerfelt in 1984. This theory postulates that a company needs to first check within its organization to find the sources of competitive advantage before looking at the outside environment. The theory assumes that each organization has unique resources and capabilities and these forms the firms' competitiveness.

In resource-based view, a firm creates a competitive barrier by managing its resources in a manner that cannot be copied by the competitors. In this case, the firm creates a competitive advantage over competing firms when its resources are unique, scarce, firm-specific and valuable, cannot be traded, copied or substituted (Barney, 1999). A firm can realize competitive advantage if its resources exhibit these value, rarity, imitability and organization (VRIO) attributes (Mahoney & Pandian, 1992).

According to Hitt and Hoskisson, (2009), resources are inputs into a firm's production process while capability is the capacity for a set of resources to perform a task or an activity in an integrative manner. With RBV, the variance in business performance among organizations of the same industry is mainly due to the unique resources and capabilities owned by individual organization rather than the characteristics of the industry structure. Resources and capabilities of a firm are the key considerations in its strategy implementation practices (Grant, 1991). This is because they form the basis upon which a firm can establish its identity and source of its competitiveness.

The theory postulates that a company should first look within its organization for opportunities of competitive advantage before checking the external surrounding. It assumes that each organization has unique resources and capabilities and these forms the firms' competitiveness. This study looked into the identified resources that multinational companies are adopting in an effort to remain competitive in the market; planting resources, harvesting resources, cutting resources and input application resource. This study viewed the mechanization of planting, harvesting, cutting, and input application, as resources that multinational corporations need to have close to their chest so as to compete effectively in the market. The current study looked into planting resources, harvesting resources, cutting resources and input application resources.

2.1.3 The Balanced Score Card Model

The Balanced Score Card (BSC) is a strategy implementation tool developed by Drs. Robert Kaplan and David Norton in the early 1990s. It is a very essential tool in measuring performance and guiding the performance of an organization by providing

feedback on processes, progress and results of any strategic goals. BSC model takes into account the financial, learning and growth, business process and customer aspects (Norton & Kaplan, 1992). It complements traditional financial indicators with measures of performance for customers, internal processes, and innovation and improvement activities. It gives a balance between performance drivers and the outcome hence the position of organizational performance.

Managers recognize the impact that measures have on performance and that effective measurement must be an integral part of the management process. The balanced scorecard is therefore an essential tool as it provides executives with a comprehensive framework that translates a company's strategic objectives into a coherent set of performance measures. It is a management system that can motivate breakthrough improvements in such critical areas as productivity, cost management, employee welfare management e.g. monitoring of safety issues and even production in yield. Through BSC model application, organizations are able to see clarity and actionable translations of their vision and strategic options (Atkinson, 2010). This is therefore one of the best performance management tools in which every organization that strive for competitiveness in the global market must adopt and administer to every key player in the strategic implementation process.

The BSC tool measures performance of any strategic goals by assessing the financial, learning and growth, business process and customer aspects (Norton & Kaplan, 1992). Safety of employees at work place has however not been captured among the stated perspectives. This study shall consider safety as a measure of employee welfare and performance, and its effect on competitiveness of an organization. This has not been addressed.

The BSC model in this context borrow a lot from the performance indicators like the mechanization of planting resources, harvesting resources, cutting resources and input application. Such indicators determine competitiveness of the multinational corporations in terms of cost, productivity, safety and production.

2.2 Empirical Review of Literature

Empirical studies that have been done by previous scholars which relates to the topic of research was reviewed. Straub (2011) describes empirical research as a way of learning through direct or indirect observation or experience and by which evidence can be analyzed quantitatively or qualitatively. Jeanie adds that through quantifying the evidence or making sense of it in a quantitative form, a researcher can answer empirical questions which should be clearly defined and answerable with the evidence collected usually called data. The finding from the empirical reviews studied related to the role of the independent variables under study and it is in this review that the researcher identified the gaps that were addressed in the current study.

2.2.1 Planting Strategies and Competitiveness

Ever since ancient times, when communities first began cultivating plants, people have used tools and equipment to help them grow and harvest crops. Much of the world's land is still cultivated under conditions that are not compatible with modern mechanization. However, modern tools are used extensively in the US, UK, Canada, Western Europe & Australia.

According to Landis (2009), the most important implement of modern agriculture is the tractor which provides locomotion for many other implements and can improvise power, via its power shaft, for the operation of machines drawn behind the tractor. Nations such as India are making use of Earth Augers in digging up of holes for tea

planting. This greatly improves the time force use in preparing of land to plant nearly three times compared to human force labor. Huang (2011) posits that, Taiwan has improved their cultivation processes by the introduction of land augers by the year 2001 in order to see the tea factories compete with the global Tea Producers. The technology is slowly being adapted in Kenya with few firms using such kind of technology in their daily preparation of tea cultivation. Thus, with the improvement of technology, quality and efficiency in production is set to improve and eventually place organizations in a more competitive edge.

Upasi Tea Research Foundation on its publication on Tea Cultivation & Practices gives an insight of the roles of mechanization as some technology-based strategies in field operations. It states that cultural operations such as pitting, pruning and harvesting are now being mechanized. ‘We recommend the use of machines for increasing the productivity of the workers.’ The STIHL BT 120 C earth auger can increase the productivity of the worker nearly three times when compared to manual pitting. Pruning machines with spinning discs are nearly four times more efficient than the manual pruning with knives. One man and two men operated harvesters can increase the productivity four-fold. The summary somewhat identifies the role of each strategy but no in-depth analysis on other strategies like input application and factors like safety has been analyzed. Thus, the need for more research on the areas not addressed.

2.2.2 Harvesting Strategies and Competitiveness

Tea plays is a high foreign-exchange earner its producer countries. Best quality teas are attained through a high labour engaging process which involves selective hand plucking (Australian Government, 2012). International tea estates have been forced to

automate their harvesting processes due to constantly rising costs of production and the decreasing labour availability.

Kenya being one of the leaders in tea producing countries in the world is finding it strenuous to compete with countries such as China, Japan, Australia and many more. Harvesting tea involves a large expenditure especially if human labour is being used (Chen & Mao, 2006). Labour shortage in the aging workforce means that traditional manual plucking of tea leaves must be replaced with technological; plucking which is very common in Japan and Argentina. Chang (2006) compared the efficiency of manual plucking and machine plucking of tea and concluded that machine has a greater efficiency in plucking tea leaves than manual labour of human beings. Countries such as Taiwan and Australia have adapted to machines to being used in the process of harvesting tea in order to save time and cost of production is lowered while quality is still at its best.

With jobs becoming more complex, there is need for expert skills and professions. While man is to error, machines aren't. While machinery can run throughout a given period people easily get exhausted. Machines however need to be operated by people with qualified skill to make work more efficiently. With human weaknesses and manmade errors, mechanization ensure exclusion of or minimal human interference (Phiph, 2001).

An informal investigation into labour issues in the tea sector in Kericho by KHRC (2006) focused on Unilever Tea Kenya Ltd and James Finlay Kenya Ltd. It looked into various company operational practices to evaluate the working conditions and terms of service for low cadre employees. One of in-depth analyzed areas was the adoption of the mechanical harvesting technology. The report indicates that there was

a general fear and negative perception that saw the labour offices declare 500,000 employees risking being jobless. KTGA chair declared its organization's support towards use of suitable technology-based strategies in tea production. Through this, the organization championed the use of technology that would increase productivity and ensure competitiveness thus ensuring the sustainability of the tea industry. James Finlay team described some of the tea production challenges to include the increasing production costs. The management acknowledged that companies did not have much choice but to employ mechanization in order to survive in business. As mechanized tea harvesting was only to be applied to a few select variety of tea, application of this policy would not lead to mass redundancy. This argument to some extent is right since labour relations with adoption of machine was not easily welcomed by the employees and the neighboring communities but due to the adoption of natural attrition method of introducing the technology, cases of employee redundancy did not occur.

Ongong'a & Ochieng (2013) in their research on Innovation in the Tea Industry: The Case of Kericho Tea, Kenya, noted that adoption of new technologies varies from firm to firm with the majority of firms (33.3%) not having adopted new technologies at all despite their development. For the rest who have adopted new technologies, the extent of adoption varied from little (30%), to moderate (20%), to great (10%) and to very great (10%). The scholars note that in an effort to deal with the rising costs of production together with the stiff industry competition, some tea companies in Kericho employed mechanical tea harvesting methods. The study aimed to establish effects of innovation on performance of tea firms in Kericho town, Kenya. The study revealed that innovative strategies adopted resulted into increased revenues, high

productivity levels and reduced costs, therefore recommended mechanization as one of the important innovative methods that can be adopted in tea harvesting.

2.2.3 Cutting Strategies and Competitiveness

In this study the cutting strategy in focus is pruning of mature tea bushes. Tea pruning is a plant maintenance activity. It involves chopping off of some part of the tea bush; to manage diseases and bush productivity. Pruning ultimately helps to increase the overall yield or quality of the crop.

Timing of pruning operations is crucial in maintaining recovery of plants and sustained production. The operation normally takes place between end of October and early February. The operation is labor intensive has overtime become costly due to continual rise in labour wages and labour shortage. A study carried out by Saikia', Sarma & Das (2011) revealed that under machine pruning there was a tendency to produce more knots due to close emergence of primaries from near the top end of the pruning stub. However, this did not reduce the yield or number of plucking points at the plucking table and therefore concludes that machine can be used for pruning of tea with advantage. Earlier reports of preliminary trial on machine pruning at Tocklai were encouraging (Anon., 2011).

In a Comparative Study of the Tea Sector in Kenya by KHRC (2008), on the key challenges affecting the production of tea in Kenya both James Finlay and Unilever management indicated a problem of increasing production costs especially labour costs. Unilever presented that from 1999 to 2006, the cost of labour as a percentage of total costs had significantly increased. In 1999, the percentage cost of labour was 43% of total costs and had risen to about 55% in 2006. Comparatively, labour costs and inflation rate had increased over the years but in a non-proportionate manner.

2.2.4 Input Application Strategies and Competitiveness

Tea productivity in the smallholder sub-sector has been relatively lower compared to the estates sub-sector over the years and the yields are still well below potential. For example, in the year 2008, the Tea Board of Kenya (TBK) reports that smallholders had 107,115 ha of land under tea and produced 210 million kilograms of made tea while the estates had 50,605 ha and 135 million kilograms of tea (TBK, 2008). This translates to an output level of 1,960 and 3,023 kg made tea per hectare per year respectively. This is despite the fact that small holders grow potentially high yielding vegetative propagated tea varieties (clonal teas) as compared to estates that grow diverse cultivars including the low yielding types propagated from seed (seedling teas). This disparity in tea production and the large gap in productivity between the smallholders and estates is a major source of concern which needs to be addressed since tea in Kenya is grown on prime agricultural land with very good soils and climate capable of producing over 6,000 kg of made tea per hectare per year (Kavoi, Kosura, Owuor & Siele, 2003). One way of improving agricultural production and productivity is through the introduction of improved agricultural technologies and application of good agricultural practices.

Huang (2010) carried out a study on the Effect of Lime Application on Microbial Community in Acidic Tea Orchard Soils in Comparison with Those in Wasteland and Forest Soils. The study investigated the effect of lime application on soil microbial community diversity in the soils of three tea orchards, wasteland and forest. It however focused on the effect of the input itself but not on the technology used with the input. This therefore leaves a gap to be study and closed. Previous studies done at TRK (CA) have clearly shown the disadvantages of fertilizer application through the conventional hand application method.

A survey on fertilizer application for tea production was carried out in Malawi in 1995. Its findings indicated that with normal hand applications 75% of the ground in the tea fields was either unfertilized, sparsely fertilized or received heaps of fertilizers, leaving only 25% of the ground area with good coverage (Limwado, 1996). With such issues at hand, it definitely leaves gaps in the process which eventually lead to negative consequences through unsatisfactory results. Another study was undertaken in Tea estate in Zimbabwe to quantify the effects of poor application of fertilizer on yield. The results showed a 13-26% and 14-20% yield reduction in yield when fertilizer was heaped as compared to normal hand and aerial simulation application respectively. Loss in crop when fertilizer is not applied properly is very considerable and has serious effects on tea growers' expected returns. The study indicated human labour has a tendency to heap fertilizer, especially in the middle of the field where supervision is not easy. The main advantages of aerial application of fertilizer are that the requirement for supervision is much less and application is more effective. This may actually pay for the higher costs of aerial application (Limwado, 1996). While these studies were all done outside Kenya, a study in Kenya would be recommended in order to reflect the true state in the Kenyan tea producing organizations.

2.3 Summary of Gaps in Literature Review

This study has been supported by three theories; Labour Theory of Value, Resource-Based View Theory and The Balanced Card.

Labour Theory of Value illustrates the relationship between input in cost of production and the output margins; when one inputs a hard and extensive labour, the product cost is expected to be higher than those who do not apply the same labour

intensity. This theory only focused on cost which is the dependent variable in study but not on productivity, safety and production levels.

Resource-Based View Theory assumes that each organization has unique resources and capabilities and these forms the firms' competitiveness. The theory does not illustrate how to measure of a company's competitiveness based on its unique resources. This study identified planting, harvesting, cutting and input application strategies as unique resources that multinational companies have adopted and measured level of competitiveness in terms of cost, productivity, safety and production.

The Balanced Card tool measures performance of any strategic goals by assessing the financial, learning and growth, business process and customer aspects (Norton & Kaplan, 1992). Safety of employees at work place has however not been captured among the stated perspectives. This study considered safety as a measure of employee welfare and performance, and its effect on competitiveness of an organization.

From the previous studies cited above, it is evident that a lot has been done about the tea industry and their management practices. However, most of the studies that have been done on technology-based strategies have only focused on the mechanical tea harvesting machine with little to none being done on other mechanized tools that have been adopted as technology-based strategies in tea industry and their role in competitiveness. Such are the tea planting machines and its role in this era of massive tea replanting of old tea bush areas with new superior quality clones. Not much has been done on the pruning machines which have been in place for over a decade now in most tea estates. Little research on mechanization of input application in the Kenyan fields has been carried out, with an exception of TRFK which, is an advisory body for tea producers. This project therefore, aimed to focus on the four main

technology-based strategies of harvesting, planting, input application and cutting with the main focus on multinational tea companies, with the aim of assessing the roles of the specific technologies in place in tea business.

A research by KHRC, 2008 on Key challenges affecting the production of tea in Kenya; A Comparative Study of the Tea Sector in Kenya looked into problem of rising costs of production especially the rising costs of labour and inflation rates but does not cover the strategic solutions adopted to minimize cost of production. Cost of production is a major factor contributing to any company's competitiveness. Therefore, how a company manages its costs of production defines its place in the competitive market. This study will focus on the specific strategies used in production and their roles in competitiveness

An informal investigation into labour issues in the tea sector in Kericho, KHRC, 2006 looked into individual perception towards the adoption of mechanical harvesting. The various strategies that have been implemented by various multinational tea companies as ways of remaining competitive is also something that should be investigated. This study only focused on mechanical harvesting strategy but did not look into other strategies on planting, input application and pruning. This study will therefore look into all the four strategies: planting, harvesting, pruning and input application.

A study by Lerah Amondi Odhiambo (2015) on Strategy Implementation and Performance of Major Tea Factories in Kericho County, Kenya focused on strategy implementation practices that help companies achieve better organizational performance with a focus on major tea factories in Kericho County. Another study conducted by Elias Kiarie Kagira, Sarah Wambui Kimani & Kagwathi Stephen Githii in 2012 on Conceptual paper on Sustainable Methods of Addressing Challenges

Facing Small Holder Tea Sector in Kenya: A Supply Chain Management Approach. identified the special role of competitive supply chain strategies in Small Holder Tea Sector in Kenya. The studies of the past focused on small-scale factories and agencies leaving out the most affected organizations when it comes to competition in the tea markets who are the multinational corporations hence this study.

A study by Joseph Kiprono, Kirui, Hellen Chepkorir Tirop, and Joseph K. Rotich (2014) on Socio-Economic Effects of Liberalization of Small-Scale Tea Sector in Kenya: Evidence from Tea Farmers in Konoin District. This study used case study design to establish the effect of liberalization in output in KTDA small scale tea farmers. Most companies are shifting to mechanized methods of operations as the means to remain competitive. This is the area that is highly measurable and most effective. The current research study will use descriptive research design and causal-comparative research design to analyze the effect of technology-based strategies on competitiveness of multinational tea companies.

Dr. Jared O. Ongong'a & Mr. Albert Ochieng (2013) conducted a study to analyze revenue, productivity and cost as a result of innovative strategies adopted by tea organizations in Kericho. This study did not cover safety and production in analyzing company competitiveness in adopting technology-based strategies.

A study by Rotich John Kiplangat (2012) on the strategies that JFK had put in place to respond to the competitive environment focused on diversification, vertical integration, research and innovation and certification. This study focuses on technology-based strategies; Planting, harvesting, cutting and input application strategies as the independent variables of study.

Table 2.1 Summary of Research Gaps

Researches	Theme/objective/topic	Research findings	Research gaps	Focus of the current study
KHRC, 2008	Key challenges affecting the production of tea in Kenya; A Comparative Study of the Tea Sector in Kenya	Problem of rising costs of production especially the rising costs of labour and inflation rates	The study does not cover the strategic solutions adopted to minimize cost of production.	This study focused on the specific strategies used in production and their roles in competitiveness
(KHRC) November 2006	Informal investigation into labour issues in the tea sector in Kericho	The report indicates that there was a negative perception with the adoption of mechanical harvesting	This study only touched on mechanical harvesting and nothing on planting, input application and pruning.	This study focused on other strategies that include; planting, harvesting, pruning and input application.
Lerah Amondi Odhiambo (2015)	Strategy Implementation and Performance of Major Tea Factories in Kericho County, Kenya	Recommendation of the need to apply strategy implementation practices to a greater extent to achieve better organizational performance.	The study had the target population drawn from 32 major factories in Kericho.	This target population of this study was from multinational corporations in Kericho.
Dr. Jared O. Ongong'a & Mr. Albert Ochieng (2013)	Innovation in the Tea Industry: The Case of Kericho Tea, Kenya; effects of innovation on performance of tea firms in Kericho town Kenya.	The study revealed that innovative strategies adopted resulted into increased revenues, high productivity levels and reduced costs.	The study only focused on revenue, productivity and cost.	This study focused on safety and production in addition to cost and productivity.
Rotich John Kiplangat (2012)	Strategic Responses by James Finlay (Kenya) Limited to Competitive Environment in Kenya	The research conclusions indicated that JFK has diversified into flower and tea production as well as divesting from other countries while increasing their investments in Kenya.	The study only focused on; diversification, vertical integration, research and innovation and certification.	This study focused on technology-based strategies; Planting, harvesting, cutting and input application strategies.
Joseph Kiprono, Kirui, Hellen Chepkorir Tirop, and Joseph K. Rotich (2014)	Socio-Economic Effects of Liberalization of Small-Scale Tea Sector in Kenya: Evidence from Tea Farmers in Konoin District	The findings indicate the liberalization does not contribute much to output in small scale tea farmers	This study used case study design.	This research study used descriptive research design and causal-comparative research design
Elias Kiarie Kagira, Sarah Wambui Kimani & Kagwathi Stephen Githii in 2012	Conceptual paper on Sustainable Methods of Addressing Challenges Facing Small Holder Tea Sector in Kenya: A Supply Chain Management Approach	Identified the special role of competitive supply chain strategies in Kenyan Small Holder Tea Sector	The study focused on smallholder and KTDA tea sector in Kenya	This study focused on Multinational corporation as the main player.

Source: researcher (2017)

2.4 Conceptual Framework

The conceptual framework illustrates how the independent variables affect the dependent variable; the technology-based strategies in place will in turn affect the firms' performance and competitiveness. Strategy implementation has a role in the competitiveness of the selected multinational tea companies through specific roles brought about by each adopted technology-based strategy as illustrated in the conceptual framework in figure 2.1.

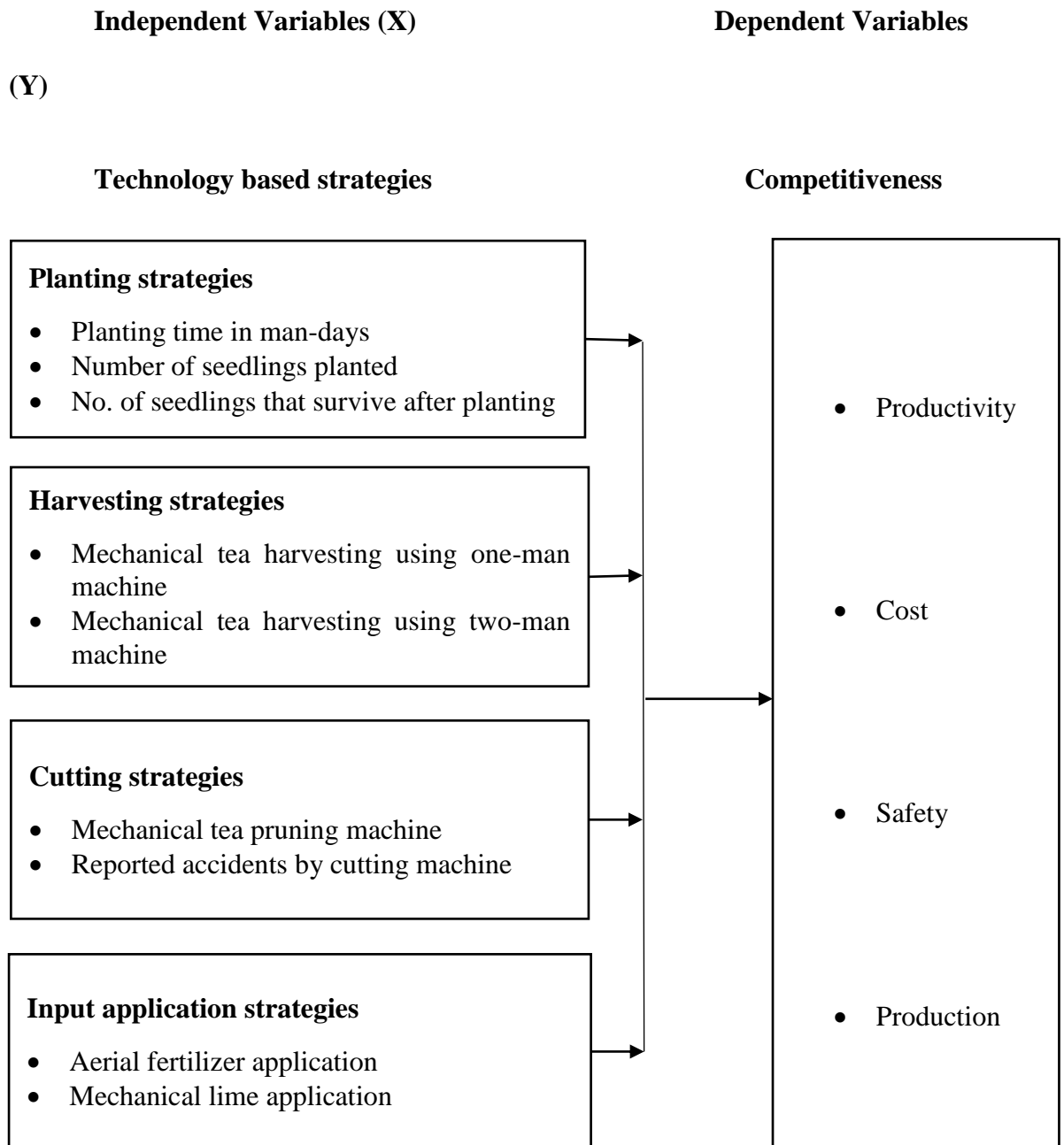


Figure 2.1 Conceptual Framework of the study
Source: Researcher (2018)

The study analysis was based on the four technology-based strategies as the independent variables. They are planting strategies, harvesting strategies, cutting strategies and input application strategies. These strategies were analyzed in relation to competitiveness in terms of productivity, cost, safety and production as the depended variables respectively.

In planting strategy, the study analyzed the machinery that the selected organizations have used overtime for planting tea seedlings. It looked into the effect of mechanized tea planting in productivity in terms of work done and output. The indicators used included planting time as measured in man-days, number of seedlings planted in a given time and the number of seedlings that survive after planting.

Harvesting strategies focused mainly on the technologies that have been adopted over the years in the harvesting of tea and its role in managing cost factors of production. The study focused on mechanical harvesting machineries; one-man and two-man tea harvesting machines. Competitiveness of an organization is highly contributed by its ability to cut down the cost of production while maximizing returns.

Mechanical tea pruning was the area of study under cutting strategies. Its competitiveness was measured by the efficiency of the chosen pruning machine and the number of reported injuries during pruning directly relating to the pruning method/machine used.

Input strategies assessed competitiveness of MNCs in terms of production levels. The indicators used for the independent variables in study were aerial fertilizer application and mechanical lime application. The study sought to analyze the effect of the chosen strategy in yields of tea bushes.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

Both descriptive and causal-comparative research designs were used for this study. The two designs incorporated both quantitative and qualitative approaches. The quantitative approach, consisting of closed-ended questions elicited information to be used for descriptive and inferential purposes. The qualitative approach with open-ended questions obtained in-depth information to be used to validate descriptive and inferential results (Mwanje, 2001). Casual design measured the impact a specific change had on existing norms and assumptions as causal effect (nomothetic perspective) occurs when variation in one phenomenon, an independent variable, leads to or results, on average, in variation in another phenomenon, the dependent variable as described by Ernest W. and Jennifer Kubn (2010).

Descriptive research designs helped provide answers to the questions of who, what, when, where, and how associated with a particular research problem. Descriptive research was used to obtain information concerning the current status of the phenomena and to describe "what exists" with respect to variables or conditions in a situation. It is often used as a pre-cursor to more quantitative research designs with the general overview giving some valuable pointers as to what variables are worth testing quantitatively. If the limitations are understood, they can be a useful tool in developing a more focused study. Descriptive studies can yield rich data that lead to important recommendations in practice. The approach collects a large amount of data for detailed analysis as described by the three scholars; Given, Lisa M., Neil J. Salkind and Kristin Rasmussen, (2007).

3.2 Target Population

Target population refers to a group of individuals or study subjects alike in one or many ways and form the subject in a particular study. It is the entire set of units for which the data are to be used to make inferences. Establishing study objects is the first step in designing a survey. The target population for the study were employees of multinational corporations in Kericho and Bomet Counties namely Unilever Tea Kenya, James Finlays, Williamson Tea and Sotik Tea. These corporations have management staff, supervisors and support staff (which include clerical staff, quality officers, safety officers and worker's committee representatives) who total to 135, as shown in Table 3.2. To increase the chances of getting more detailed accurate results, with reduced ambiguity in response to the questionnaires, the target population in this study was focused on management staff and graded/upper tier staff within the establishment. This is mainly due to their level of skills and understanding of business operations. Table 3.1 show the list of the selected multinational tea companies.

Table 3.1: List of Multinational Tea companies

No.	Multinational Tea companies	Location
1	Unilever Tea (K) Limited	Kericho and Bomet Counties
2	James Finlays K Limited	Kericho and Bomet Counties
3	Williamson Tea	Bomet county
4	Sotik Tea	Bomet county

Source: Research data 2018

Table 3.2: Target population

Category	Unilever Tea (K) Ltd	James Finlay Ltd	(K) Tea	Williamson Tea	Sotik Tea	Total
Management staff	10	8		2	3	23
Supervisors	25	20		5	10	60
Support staff	20	20		4	8	52
Total	55	48		11	21	

Source: Research data 2018

3.3 Sampling Design

Sampling is a procedure, process or technique of choosing a sub-group from a population to participate in the study (Ogula, 2005). It is a technique of selecting the part of population on which research can be conducted, which ensures that conclusion from the study can be generalized to the entire population. Population refers to any group of institutions, people, or objects that have common characteristics (Ogula, 2005).

Purposive sampling method was used to identify companies having technology-based strategies in study. To ensure all areas well represented in the sampling process, the researcher used Simple Random Sampling technique in which each of the selected companies was allocated proportional number depending on its population size. This method of proportional allocation ensured that the sizes of the samples from the different strata are kept proportional to the sizes of the strata (Kothari, 2004). The target population was categorized into four strata of management staff, senior staff, supervisors and the support staff.

Kothari (2011) gives that sample size should be neither too large nor too small, respectively due to cost effectiveness and accuracy in meeting the objectives. Cooper and Schindler (2008) argue that when the target population in a study is less than

1000; it is preferable to use a sample size of 40%. The sample size for the study was determined using the formula by Mugenda and Mugenda (2003) who suggests anything in the range of 10% - 50% of the target population. The study used 50% of the total target population to get the sample size except in the case of management where a census was used to reduce duplicity & redundancy of data that is to be collected and the sample size to be sufficient and collect of conclusive data. Therefore, the researcher's size will comprise a total of 54 respondents as shown in table 3.3.

Table 3.3: Distribution of Sample Size

Category/Target group	Target Population	Calculation (50%)	Sample size
Management Staff	23	$50/100 * 23$	11
Supervisors	60	$50/100 * 60$	30
Support staff	52	$50/100 * 52$	26
Total	135		68

Source: Research data (2018) from the targeted MNC websites.

3.4 Data Collection

The study employed the use of both questionnaires and secondary data analysis. The tool was developed by the researcher in a conjunction with the supervisors.

3.4.1: Data Collection Procedure

Primary data that was collected through the use of closed and open-ended questionnaires was used for the study. The respondents completed questionnaires voluntarily with the researcher providing assistance. The researcher also clarified any areas where the respondent did not understand before or as the questionnaire is answered. All the questionnaires were then collected and checked for plausibility, integrity and completeness. The questionnaire was administered using a drop and pick method and also through online access. This provided flexibility for those who may

have busy schedules e.g. the management staff and who may prefer to fill in the questionnaires at their free time. Estate journals and company information from the selected company websites and office records/reports provided secondary data where respondents did not exhaustively provide or were not captured in the questionnaire.

3.4.2 Validity

Kothari (2014) defines validity as the degree to which an instrument measures what it is supposed to measure while Rapando (2010) defines it as the accuracy and the meaningfulness of inferences, which is also the degree to which results obtained from data analysis, actually explain the phenomenon under study.

The quality of research study depends to a large extent on the accuracy of the data collection procedures. That is the instruments or tools used to collect the data must yield the type of data the researcher can use accurately to answer his/her questions (Mugenda and Mugenda, 2003). The validity of the questionnaire was determined by ensuring that questions or items in it conform to the conceptual framework of the study. Face validity was done to determine the relevance of the questionnaire to be used in the study. This was determined by assessing the items on the instrument and ensuring they appear relevant, meaningful and appropriate to the respondent. To ensure content validity, the researcher consulted the supervisor and other lecturers from the school of Business Administration of Kenyatta University in order to obtain expert judgment. The researcher used the advice and further suggestions from the experts to improve the quality of the questionnaire to ensure proper wording, clarity and relevance of the questions or items in the questionnaire.

3.4.3 Reliability

Reliability is a measure of the degree to which a research instrument yields consistent results or data after repeated trials (Mugenda and Mugenda, 2003). In assessing reliability of the data collected, the researcher used Cronbach's alpha method which allowed the researcher to review that the items in questionnaire gave possible answers. Cronbach's alpha is the most commonly used coefficient of internal consistency and is computed as follows;

Cronbach's alpha equals to or greater than 0.7 indicates a high level of internal consistency in the questionnaire (Gay, 1996). The Cronbach's alpha was computed with the aid of SPSS computer program. The value obtained by the researcher was 0.828, making the instrument reliable for data collection.

3.5 Data Analysis

To process, analyze and interpret the data, quantitative approach was applied. This process involved coding the close-ended data, entry, cleaning, transformation, analysis, and interpretation (Obure, 2002). SPSS software was used as an aid to run analyses to produce frequency distributions, percentages and measures of central tendency, where applicable. Further, graphical presentations, charts, and tables was produced using the software.

The Pearson linear correlation coefficient was applied because the study entailed determining the correlations or describing the association between two or more variables (Oso & Onen 2008). The Pearson correlation establishes the degree and direction of relationship between the independent variables that are in scale or ordinal measurements on dependent variable. For instance, human resource capacity was determined through identifying the number of trained Personnel and workers and how

it affects the utilization of Equipment facilities. Pearson correlation values will range from -1 to +1.

According to Faraway (2002) multiple linear regressions are used in situations where the number of independent variables is more than one and in quantifying the impact of various simultaneous influences of independent variables upon a single dependent variable. MLR was used to determine the influence of the four independent variables (technology-based strategies) on the dependent variable (organizational competitiveness).

The following equation of the MLR model shall be used;

$$y = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \beta_4x_4 + e$$

Where:

y = organizational competitiveness

β_0 = constant term; the value of the dependent variable when all the independent variables are 0

$\beta_i; i=1,2,3,4$ = slope parameters; regression coefficients which measure the change induced by $X_i; i=1,2,3,4$ on Y .

x_1 = Planting Strategies

x_2 = Harvesting Strategies

x_3 = Cutting Strategies

x_4 = Input application Strategies

e = error term

The probability level for; chi square, correlation and MLR analysis was set up at 95% (0.05) confidence level (Cooper & Schindler, 2006). In addition, qualitative data was

processed and analyzed following three steps. In the first step, the data was organized and summarized in as per study objectives. The second step will involve description of the summary sheets to produce a preliminary report. The third step will involve systematic analysis and interpretation of the preliminary report, which will integrate with quantitative data in the final report (Best & Khan, 2004).

Table 3.4 Operationalization and Measurement of Variables

Objective	Variables	Indicators	Quantification of variables	Measurement
To investigate the effect of planting strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya.	Planting Strategies	Planting time in man-days Number of seedlings planted No. of seedlings that survive after planting	Number of days to complete task in planting Number of plants planted per man day Number of employees required to complete task in tea planting Number of reported plant deaths	Rating 1-5 Nominal Scale
To determine the effect of tea harvesting strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya.	Harvesting Strategies	Mechanical tea harvesting using one-man machine Mechanical tea harvesting using two-man machine	Numbers of employees engaged in tea harvesting operations Number of kilos of green tea leaf harvested per employee Level of rate of earnings Total of kilos (yield) per area harvested	Rating 1-5 Nominal Scale Ratio Scale
To analyze the effect of cutting strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya.	Cutting Strategies	Mechanical tea pruning machine Reported accidents by cutting machine	Number of recorded accidents Number of tea bushes cut per man day Number of days to complete task in pruning Number of cutting tools Number of employees in pruning	Rating 1-5 Nominal Scale

To assess the effect of input application strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya.	Input Application Strategies	Aerial fertilizer application	Number of kilos of green tea leaf harvested Number of kilos of fertilizer used Number of employees required for the task in loading fertilizer Number of days to complete task in fertilizer application	Rating 1-5 Nominal Scale
		Mechanical lime application	Number of healthy plants Number of lime bags used Number of employees required for the task in lime application Days to complete task in lime application	
To determine the role of technology-based strategies on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya.	Competitiveness	Productivity	<ul style="list-style-type: none"> Completed task per man day 	Rating 1-5 Nominal Scale
		Cost	<ul style="list-style-type: none"> Amount used to harvest green tea leaf per man day 	Rating 1-5 Nominal Scale
		Safety	<ul style="list-style-type: none"> Number of accidents Number of safety gadgets 	Rating 1-5 Nominal Scale
		Production	<ul style="list-style-type: none"> Yield per hectare 	Rating 1-5 Ratio Scale

Source: Researcher (2018)

3.6 Ethical Considerations

For any research, ethical considerations are important (Mugenda & Mugenda, 2003).

During this research study, researcher shall adhere to the research ethics ensuring that no violation of ethics standards occurred.

The researcher with the authorization from Kenyatta University School of graduate studies presented an introductory letter to the selected multinational tea companies.

The letter clearly indicated the researchers' details, the areas to be studied and the

purpose of study. The researcher clearly indicated that the data and/or any other information collected from the organization during the research would only be used for the purpose academic research.

Consent to undertake the research was sought from the National Commission for Science, Technology and Innovation. Further consent was sought from the County Commissioners and the Country Directors of Education, Kericho and Bomet Counties. Upon approval, the researcher personally visited the selected estates to administer the questionnaires to respective respondents. All respondents were briefed on the objectives of the research and participation was out of their own volition. They also were informed that any information they gave was kept confidential. The information given by the respondents will therefore be treated with utmost confidentiality and only used for this study.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND PRESENTATION

4.0 Introduction

This chapter contains data analysis results and discussion on the technology-based strategies and competitiveness of selected multinational tea companies in Kericho and Bomet counties, Kenya. The data was analyzed with the help of a data analysis program, SPSS. This enabled the research data to be presented in frequencies, percentages, tables and figures. The chapter is organized into the following sections: Response Rate, respondents' characteristic, descriptive statistics and regression analysis.

4.1 Response rate

The study targeted 54 respondents as shown in table 3.3 as the sample size. The respondents managed to answer the questionnaire with timely submissions as shown in table 4.1. This was managed because the researcher employed several skills which include giving enough time to the respondents to fill the questionnaires and some even submitted through email their scanned copies of the questionnaires.

Table 4.1: Response Rate

	No of questionnaires distributed	No of questionnaires returned	% rate of questionnaires returned
Management staff	11	9	81.8
Supervisors	30	24	80
Support staff	26	21	80.8
Total	67	54	80.6

Source: Survey Data 2019

Table 4.1 indicates that 54 (80.6%) of the sample size participated in the study. According to Mugenda and Mugenda (1999) a response rate of 50% is adequate for analysis and reporting while a response rate of 70% and above is excellent. This study therefore attained an excellent response rate for adequate analysis and discussion.

Table 4.2: Reliability

Cronbach's Alpha for Independent Variable	Cronbach's Alpha Based on Standardized Items ^a	N of Items
Planting strategies - 0.79	0.7	5
Harvesting strategies - 0.76	0.7	5
Cutting strategies – 0.88	0.7	6
Input application strategies – 0.89	0.7	10
Competitiveness – 0.82	0.7	5
Cronbach's Alpha average 0.828	0.7	

Source: Survey Data 2019

The Cronbach's Alpha coefficient of the instrument was greater than 0.7, this indicated that the study was reliable by a large extent.

4.2 Respondents' Characteristics

4.2.1 Respondents' Gender

Respondents were requested to indicate their gender, age bracket, position held, highest level of education, whether their skills require training, acquisition of the said skills and if the employer trains them.

Table 4.3: Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
male	31	57.4	57.4	57.4
Valid female	23	42.6	42.6	100.0
Total	54	100.0	100.0	

Source: Survey Data 2019

Table 4.3 indicates that 31 respondents were male while 23 were female. From the data, majority of the respondents who participated in the study were male, a clear indication that most of the employees in the companies are males.

4.2.2 Respondents' Age

Table 4.4: Age Bracket

	Frequency	Percent	Mean	Standard deviation
Valid 21-25 years	3	5.6		
26-30 years	18	33.3		
above 31 years	33	61.1		
Total	54	100.0	3.56	0.604

Source: Survey Data 2019

Table 4.4 shows that, 3(5.6%) respondents were aged between 21-25 years, 18 (33.3%) between 26-30 years, and 33 (61.1%) were above 31 years. The mean was 3.56 as most of the respondents were in the third category of above 31 years of age. Majority of the respondents were above 31 years. The purpose of obtaining data on age was to help know the kind of workforce found at the companies.

4.2.3 Respondents' Position in the Company

Table 4.5: Position Held

	Frequency	Percent	Mean	Standard deviation
Valid Management	9	16.7		
Supervisor	24	44.4		
Support staff	21	38.9		
Total	54	100.0	2.22	0.718

Source: Survey Data 2019

Table 4.5 shows the distribution of respondents from the interviewed sample size. 9(16.7%) respondents represented the management, 24(44.4%) respondents represented the supervisors and 21(38.9%) respondents represented the support staff.

4.2.4 Respondents' Level of Education

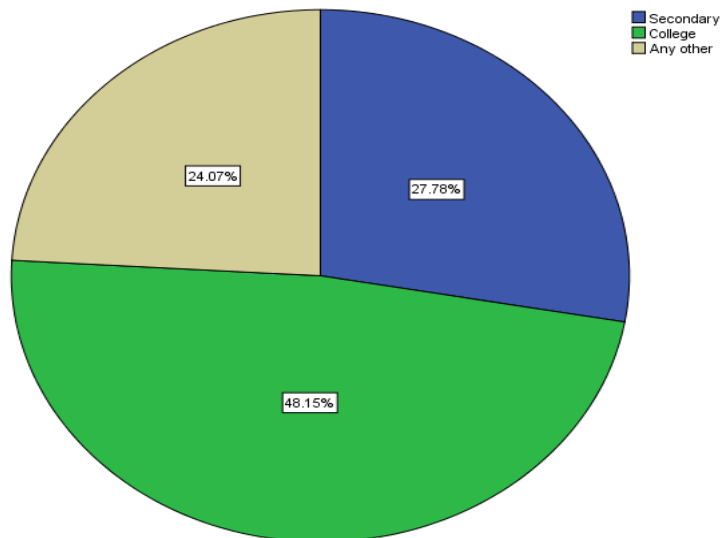


Figure 4.1: Highest academic level
Source: Survey Data 2019

Figure 4.1 shows that 22.78% of the respondents had secondary education, 48.15% of the respondents had college education and 24.07% of the respondents had any other education which ranged from degree level to postgraduate degrees. Majority of the respondents possess college education. The intention of obtaining data related to level of education was because it is related to the ability to formulate and implement technological advance in the tea sector.

4.2.5 Respondents' Skills

The researcher inquired on the skills; whether the job that the respondent does requires skills to carry out and the responses are shown in figure 4.3.

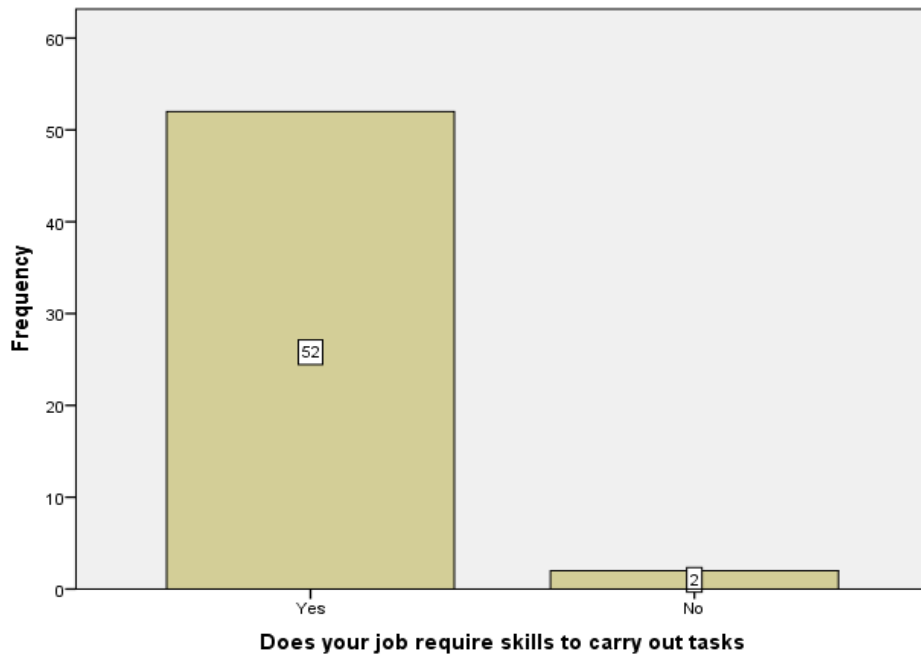


Figure 4.2: Skills required to carry out tasks

Source: Survey Data 2019

The findings indicate that the 52 respondents indicated that the jobs they are engaged in require a skill to handle it, while only 2 respondents indicated that skills aren't needed in the jobs they do. Further the researcher went forth to ask the respondents how they acquired their skill set for the job they are engaged in; the findings are shown in table 4.6.

Table 4.6: Skills Acquisition

	Frequency	Percent	Mean
Valid Trained	45	83.3	1.15
Valid Acquired	8	14.8	
Valid Total	53	98.1	
Missing System	1	1.9	
Total	54	100.0	

Source: Survey Data 2019

The findings in table 4.6 indicate that, those who are trained by their employer were 45(83.3%) respondents, 8(14.8%) acquire their skills through their own private ways and 1(1.9%) respondent did not indicate their response. Majority of the respondents

are trained on the skills to undertake a job. The researcher went forth to determine how those were trained on the skill got to learn the skill, figure 4.3 shows the findings.

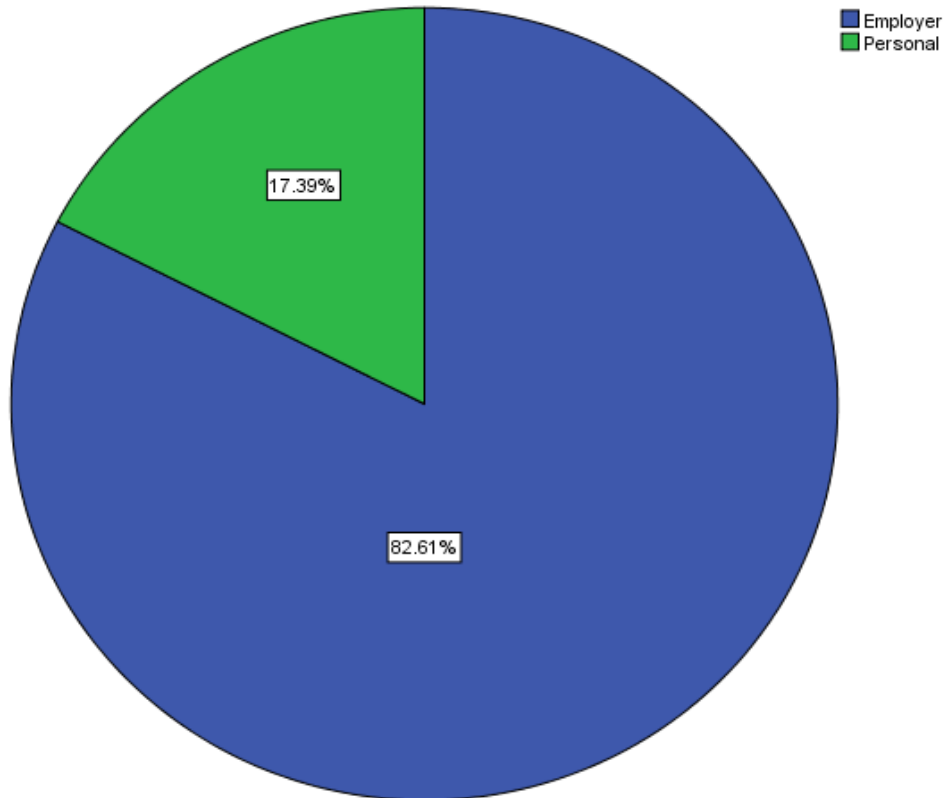


Figure 4.3: Training Done by the Employer or Personal
Source: Survey Data 2019

The findings indicated that 82.61% of the respondents were trained by the employer and 17.39% of the respondents acquired the training through personal means. Majority of the respondents were trained by their employers.

4.3 Descriptive statistics

This section shows the statistics that describe the variables of the study. In order to do so, the researcher gave the respondents statements on a likert scale of strongly agree (SA) agree (A) undecided (U) disagree (D) and strongly disagree (SD) rated 5 to 1 for them to indicate the level of agreement. The researcher did mean calculation to get the

average score and calculation of standard deviation to show the variation in responses from the mean.

4.3.1 Planting Strategy

The first objective of the study sought to investigate the effect of planting strategy on competitiveness of the selected multinational tea companies in Kericho and Bomet Counties, Kenya. This is shown in table 4.7.

Table 4.7: Planting strategy

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Mean	Standard deviation
Large scale planting of tea using mechanical machinery affects the number of days required to complete task	31 57.4%	20 37%	1 1.9%	1 1.9%	1 1.9%	4.46	0.794
The number of tea plants planted per man day is higher when the mode of planting is mechanized	23 42.6%	13 24.1%	7 13%	6 11.1%	5 9.5%	3.80	1.351
Use of mechanical machines in tea planting reduces the number of people required to complete task	41 75.9%	12 22.2%	1 1.9%	-	-	4.74	0.483
Mechanical tea planting influences the survival rate of plants	10 8.5%	25 46.3%	14 25.9%	4 7.4%	1 1.9%	3.72	0.920
Planting strategies influence competitiveness	19 35.2%	31 57.4%	4 7.4%	-	-	4.28	0.596
Aggregates						4.2	0.8288

Source: Survey Data 2019

In table 4.7, 31(57.4%) respondents strongly agreed that large scale planting of tea using mechanical machinery affects the number of days required to complete task, 20(37%) agreed, 1(1.9%) were undecided, 1(1.9%) disagreed and 1(1.9%) strongly disagreed. Majority of them strongly agreed that large scale planting of tea using

mechanical machinery affects the number of days required to complete task (mean of 4.46), variation in the number of days was low (standard deviation of 0.794).

About 23(42.6%) respondents strongly agreed that the number of tea plants planted per man in a day is higher when the mode of planting is mechanical, 13(24.1%) agreed, 7(13%) were undecided, 6(11.1%) disagree and 5(9.5%) strongly disagreed. Majority of them agreed that mechanized planting output is moderately high. The change in planting was slightly significant (mean of 3.80). Variation was quite high (standard deviation of 1.351).

On whether the use of mechanical machines in tea planting reduces the number of people required to complete task; 41(75.9%) respondents strongly agreed, 12(22.2%) agreed and 1(1.9%) were undecided. Large number of the respondents agreed that using mechanical machines to plant tea greatly reduces the number of people required to complete task (mean of 4.74) but the deviation in the latter was low (standard deviation of 0.483).

Ten (8.5%) respondents strongly agreed that mechanical tea planting influences the survival rate of plants, 25(46.3%) agreed, 14(25.9%) were undecided, 4(7.4%) disagreed and 1(1.9%) strongly disagreed. A significant number of the respondent agreed that the survival rate of plants is somehow influenced by mechanical tea planting (mean of 3.72). Variation in survival rate was low (standard deviation of 0.920).

Concerning whether planting strategies influence competitiveness, 19(35.2%) respondents strongly agreed, 31(57.4%) agreed and 4(7.4%) were undecided. Respondents agreed that planting strategies had high influence on competitiveness (mean of 4.28) but variation in competitiveness was low (standard deviation of

0.596). Further findings indicated that the mechanical planting has reduced the cost of planting, the time taken in planting and the handling of the plants is also enhanced. However, Hill & Jones (1995) study findings indicated that planting strategies is key to sustenance of the competitiveness of an organization while the current study finding showed that mechanical planting reduce cost, time taken to plant and handling of plants as this directly impacts competition.

4.3.2 Harvesting Strategy

The second objective of the study sought to determine the effect of tea harvesting strategy on competitiveness of the selected multinational tea companies in Kericho and Bomet Counties, Kenya.

Table 4.8: Tea harvesting strategy

	Strongly Agree	Agree	Undecided	Disagree	Strongly disagree	Mean	Standard deviation
Use of machines in tea harvesting directly affects the number of employees required to harvest a given area of tea	51 94.4%	3 5.6%	-	-	-	4.94	0.231
Kilos of tea harvested by an individual employee is higher when using mechanical harvesting that when manual harvesting is used	39 72.2%	13 24.1%	1 1.9%	-	1 1.9%	4.65	0.705
Employees' earnings are higher with mechanical harvesting than in manual harvesting	18 33.3%	12 22.2%	16 29.6%	7 13%	1 1.9%	3.72	1.123
Crop yield is higher with the use of mechanical tea harvesting machines	12 22.2%	21 38.9%	10 18.5%	11 20.4%	-	3.63	1.051
Harvesting strategies play a crucial role in competitiveness	34 63%	18 33.3%	2 3.7%	-	-	4.59	0.567
Aggregates						4.306	0.7354

Source: Survey Data 2019

On whether the use of machines in tea harvesting directly affects the number of employees required to harvest a given area of tea, 51(94.4%) respondents strongly agreed and 3(5.6%) agreed. All the respondents agreed that use of machines in tea harvesting directly affects the number of employees required to harvest a given area of tea (mean of 4.94). The variation of the number of employees required during harvesting due to use of machines was low (standard deviation of 0.231). However, there exist some difference in the outcome of the findings with Maina's & Kaluli's (2013) study whose findings indicate that tea production cost reduces with the introduction of machine harvesting thereby increasing the competitiveness of the organizations handling the tea as it focus on the cost not the employees required to harvest.

About 39(72.2%) respondents strongly agreed that kilos of tea harvested by an individual employee is higher when using mechanical harvesting than when manual harvesting is used, 13(24.1%) agreed, 1(1.9%) were undecided and 1(1.9%) strongly disagreed. It was agreed that in mechanical harvesting, the kilos of tea harvested by an individual employee is higher than when manual harvesting is used (mean of 4.65). The variation of kilos of tea harvested mechanically was low (standard deviation of 0.705).

On whether employees' earnings are higher with mechanical harvesting than in manual harvesting 18(33.3%) respondents strongly agreed, 12(22.2%) agreed, 16(29.6%) were undecided, 7(13%) disagreed and 1(1.9%) strongly disagreed. Many respondents agreed that employees earn higher with mechanical harvesting than in manual harvesting (mean of 3.72). The variation in employee's earnings when working with mechanical harvesting were quite high (standard deviation of 1.123)

with a significantly high percentage of respondents being undecided and disagreeing with the statement.

With regards to whether crop yield is higher with the use of mechanical tea harvesting machines 12(22.2%) respondents strongly agreed, 21(38.9%) agreed, 10(18.5%) were undecided and 11(20.4%) disagreed. They agreed that crop yield is fairly high with the use of mechanical tea harvesting machines (mean of 3.63). The variation of crop yield harvested mechanically was slightly high (standard deviation of 1.051). These findings support Chandra's and Onsando's (2006) study who found out that with mechanical plucking, most tea yield is higher but quality parameters decline. Though there is concurrence in the findings Chandra and Onsando's went further to show how quality has been foreshadowed by machines.

Thirty-four (63%) respondents strongly agreed that harvesting strategies play a crucial role in competitiveness, 18(33.3%) agreed and 2(3.7%) were undecided. High number of them agreed that harvesting strategies play a crucial role in competitiveness (mean of 4.59) but variation in competitiveness was low (standard deviation of 0.567). Further findings indicated that harvesting strategies have greatly reduced the cost of operation in most organizations enabling them to remain in operation even during low season of production. However, the rate of earning per kilo of harvested leaf is lower than that of manual harvesting. The kilos harvested per an individual is way more than that of manual harvesting. The earnings per day from mechanical harvesting over that from manual harvesting increases. The findings therefore are in line with Graves, Matthews and Waldies. (2004) research outcome. Their findings indicated that earnings from mechanical harvesting is quite high. Despite the fact current study's findings are similar with the findings of Graves,

Matthews and Waldies. (2004) research, the welfare of the employees is at stake here as the rate of earnings is low.

4.3.3 Cutting Strategy

The third objective of the study sought to analyze the effect of cutting strategy on competitiveness of the selected multinational tea companies in Kericho and Bomet Counties, Kenya. The findings are shown in table 4.9.

Table 4.9: Cutting strategy on competitiveness

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Mean	Standard deviation
Use of mechanical tea pruning machines has influenced the number of reported cases of accidents during pruning operation	26 48.1%	21 38.9%	7 13%	-	-	4.35	0.705
The cutting machine used during tea pruning affects the number of tea bushes cut per person	39 72.2%	14 25.9%	-	-	1 1.9%	4.67	0.673
The use of pruning machine reduces the number of days to prune a given area of tea	45 83.3%	9 16.7%	-	-	-	4.83	0.376
Mode of cutting determines the number of cutting tools required for pruning a given area of tea	31 57.4%	16 29.6%	7 13%	-	-	4.44	0.718
Mechanical pruning reduces the number of employees required to prune a given area of tea	43 79.6%	11 20.4%	-	-	-	4.80	0.401
Competitiveness is a function of cutting strategies	33 61.1%	16 29.6%	3 5.6%	1 1.9%	1 1.9%	4.53	0.696
Aggregates						4.603	0.5948

Source: Survey Data 2019

Table 4.9 indicates the findings of the influence of cutting strategies on competitiveness. The use of mechanical tea pruning machines has influenced the

number of reported cases of accidents during pruning operation as 26(48.1%) respondents strongly agreed, 21(38.9%) agreed and 7(13%) were undecided. Majority of the respondent agreed that mechanical tea pruning machines has influenced the number of reported cases of accidents during pruning operation (mean of 4.35) but variation was low (standard deviation of 0.705). The findings upheld the findings of Edwards, Ferner, Marginson, Tregaskis, Adam, Meyer and Michael (2007) who reported decreased injuries to employees with mechanization of tea pruning. Note that this only happens when the operators have a sound training on operation of the equipment.

On whether the cutting machine used during tea pruning affects the number of tea bushes cut per person; 39(72.2%) respondents strongly agreed, 14(25.9%) agreed and 1(1.9%) strongly disagreed. The respondents agreed that cutting machine used during tea pruning affects the number of tea bushes cut per person (mean of 4.67). Variation of the number of tea bushes cut per person was low (standard deviation of 0.673).

Regarding the use of pruning machine in reducing the number of days to prune a given area of tea reduced and 45(83.3%) respondents strongly agreed while 9(16.7%) agreed. They agreed that the use of pruning machine greatly reduces the number of days to prune a given area of tea (mean of 4.83) but the variation in the number of days was low (standard deviation of 0.376).

Thirty-one (57.4%) respondents strongly agreed that the mode of cutting determines the number of cutting tools required for pruning a given area of tea, 16(29.6%) agreed and 7(13%) were undecided. Majority of the respondent agreed that the mode of cutting significantly determines the number of cutting tools required for pruning a

given area of tea (mean of 4.44) but the deviation was low (standard deviation of 0.718).

Concerning whether mechanical pruning reduces the number of employees required to prune a given area of tea, 43(79.6%) respondents strongly agreed and 11(20.4%) agreed. All of them agreed that mechanical pruning highly reduces the number of employees required to prune a given area of tea (mean of 4.80) but the variation was low on the number of employees required to prune a given area (standard deviation of 0.401).

About 33(61.1%) respondents strongly agreed that competitiveness is a function of cutting strategies, 16(29.6%) agreed, 3(5.6%) were undecided, 1(1.9%) disagreed and 1(1.9%) strongly disagreed. Competitiveness is a crucial function of cutting strategies (mean of 4.53) although the deviation is low (standard deviation of 0.696). Further findings revealed that the cutting strategies has allowed the companies to have the right employees for the job and that the bushes are maintained at a height. It also showed that the labour cost have been saved and safety related incidences have been addressed with the introduction of machines used for cutting. A review of safety incidents in Unilever Tea Kenya indicated an estimated average reduction in lost time accidents to from one per week to one per year since switching from manual to mechanical pruning methods.

4.3.4 Input Application Strategy

The fourth objective of the study sought to assess the effect of input application strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya. This is shown in table 4.10.

Table 4.10: Input application strategy on competitiveness

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Mean	Standard deviation
Aerial application of fertilizer to tea improves the amount of green leaf that can be harvested from a given area	13 24.1%	25 46.3%	11 20.4%	5 9.3%	-	3.85	0.899
Aerial application of fertilizer improves the spread of the amount of fertilizer per tea bush	30 55.6%	19 35.2%	2 3.7%	2 3.7%	1 1.9%	4.39	0.878
Number of employees required for fertilizer application is less when aerial means is used	48 88.9%	6 11.1%	-	-	-	4.89	0.317
Days of fertilizer operations are less in aerial application than in manual method.	45 83.3%	9 16.7%	-	-	-	4.83	0.376
Competitiveness is directed by the input strategies used in fertilizer application	24 44.4%	23 42.6%	7 13%	-	-	4.31	0.696
Lime application by mechanical means positively impacts on the health of the plants planted	24 44.4%	24 44.4%	5 9.3%	1 1.9%	-	4.31	0.722
Use mechanical lime application method improves the distribution of lime in a given area	28 51.9%	22 40.7%	2 3.7%	2 3.7%	-	4.41	0.740
Mechanical lime application requires less labour than manual application	37 68.5%	14 25.9%	-	1 1.9%	2 3.7%	4.65	0.683
Mode of lime application affects the days required to complete task	35 64.8%	15 27.8%	3 5.6%	1 1.9%	-	4.56	0.691
Competitiveness is directed by the input strategies used in lime application	23 42.6%	28 51.9%	3 5.6%	-	-	4.37	0.592
Aggregates						4.457	0.6594

Source: Survey Data 2019

Table 4.10 shows the findings on input application strategies on competitiveness, 13(24.1%) respondents strongly agreed that aerial application of fertilizer to tea

improves the amount of green leaf that can be harvested from a given area, 25(46.3%) agreed, 11(20.4%) were undecided and 5(9.3%) disagreed. Aerial application of fertilizer to tea moderately improves the amount of green leaf that can be harvested from a given area (mean of 3.85) but variation in green leaf harvested due to aerial application of fertilizer was low (standard deviation of 0.899). The findings concurred with Njogu et.al (2014) arguments that the foliar fertilizers applied aerially had significant positive effect on the overall quality of tea leaves picked.

Thirty (55.6%) respondents strongly agreed that aerial application of fertilizer improves the spread of the amount of fertilizer per tea bush, 19(35.2%) agreed, 2(3.7%) were undecided, 2(3.7%) disagreed and 1(1.9%) strongly disagreed. They agreed that aerial application of fertilizer greatly improves the spread of the amount of fertilizer per tea bush (mean of 4.39), however the variation in the spread of the amount of fertilizer per tea bush was low (standard deviation of 0.878). The findings are similar to the findings of Tsuji & Kinoshita, (2001), who found out that mechanical aerial fertilizer application allows the uniform application of fertilizer per bush. However, this only applies where the application is even and the landscape is adhering to in the application process.

Concerning whether the number of employees required for fertilizer application is less when aerial means is used, 48(88.9%) respondents strongly agreed and 6(11.1%) agreed. All them agreed that the number of employees required for fertilizer application is less when aerial means is used (mean of 4.89) but the variation in employees required for fertilizer application was low (standard deviation of 0.317).

On whether the days of fertilizer operations are less in aerial application than in manual method, 45(83.3%) respondents strongly agreed and 9(16.7%) agreed. All the respondent agreed that the number of days of fertilizer operations are significantly

less in aerial application than in manual method (mean of 4.83) but the variation in the days of fertilizer operations was low (standard deviation of 0.376).

About 24(44.4%) respondents strongly agreed that competitiveness is directed by the input strategies used in fertilizer application, 23(42.6%) agreed and 7(13%) were undecided. Majority of the respondent agreed that competitiveness is largely directed by the input strategies used in fertilizer application (mean of 4.31) but variation in competitiveness was low (standard deviation of 0.696).

On whether lime application by mechanical means positively impacts on the health of the plants planted, 24(44.4%) respondents strongly agreed, 24(44.4%) agreed, 5(9.3%) were undecided and 1(1.9%) disagreed. Lime application had great effect on the health of the plants planted (mean of 4.31) but the variation on the effect on health of the plants was low (standard deviation of 0.722).

Concerning the use of mechanical lime application method to improve the distribution of lime in a given area, 28(51.9%) respondents strongly agreed, 22(40.7%) agreed, 2(3.7%) were undecided and 2(3.7%) disagreed. The use of mechanical lime application method highly improves the distribution of lime in a given area (mean of 4.4), the deviation was low (standard deviation of 0.740).

On whether mechanical lime application requires less labour than manual application, 37(68.5%) respondents strongly agreed, 14(25.9%) agreed, 1(1.9%) disagreed and 2(3.7%) strongly disagreed. The labour required in mechanical lime application is significantly less than manual application (mean of 4.65) and the variation of labour required in mechanical lime application was low (standard deviation of 0.683). These findings corroborate the study findings by Mutwa (2016) which indicated that mass

lay off of workers and absoluteness due to some technologies was leading to loss of customers in some of the MNCs.

Thirty-five (64.8%) respondents strongly agreed that the mode of lime application affects the days required to complete task, 15(27.8%) agreed, 3(5.6%) were undecided and 1(1.9%) disagreed. Many agreed that the mode of lime application is crucial in affecting the days required to complete task (mean of 4.56 with a low standard deviation of 0.691).

23(42.6%) respondents strongly agreed that competitiveness is directed by the input strategies used in lime application, as 23 (42.6%) of the respondents strongly agreed while 28(51.9%) agreed and 3(5.6%) were undecided. Majority of the respondent agreed that competitiveness is directed by the input strategies used in lime application (mean of 4.37) and the deviation of competitiveness was low (standard deviation of 0.592). The findings of the study resonated with the findings of Owour (2001) which indicated that the use of fertilizers and lime in tea production is widely practiced in tea production as it has been demonstrated to improve productivity per unit area. In spite of this mechanical application of fertilizer and lime in tea production does not guarantee minimal wastage of the same.

4.3.5 Competitiveness

The researcher sought to assess the competitiveness of the companies. This is shown in table 4.11.

Table 4.11: Competitiveness

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Standard deviation
The level of productivity per man day in tea harvesting influences the competitiveness of the organization	39 72.2%	14 25.9%	1 1.9%	-	-	4.70	0.500
The cost of production for area of tea harvested affects the competitiveness of the organization	40 74.1%	13 24.1%	1 1.9%	-	-	4.69	0.668
Safety incidences related to company operations has an impact on the competitiveness of the organization	45 83.3%	7 13%	2 3.7%	-	-	4.76	0.642
The level of tea production in yield per hectare influences the competitiveness of the organization	47 87%	6 11.1%	-	-	1 1.9%	4.81	0.617
Productivity, cost, safety and production directly affects the competitiveness of an organization	44 81.5%	8 14.8%	-	1 1.9%	1 1.9%	4.77	0.640
Aggregates						4.746	0.6134

Source: Survey Data 2019

Table 4.11 shows that, 39(72.2%) respondents strongly agreed that the level of productivity per man day in tea harvesting influences the competitiveness of the organization, 14(25.9%) agreed and 1(1.9%) were undecided. Majority of the respondent agreed that the level of productivity per man day in tea harvesting has a great influence on competitiveness of the organization (mean of 4.70) but the variation in competitiveness was low (standard deviation of 0.500).

On whether the cost of production for area of tea harvested affects the competitiveness of the organization, 40(74.1%) respondents strongly agreed, 13(24.1%) agreed and 1(1.9%) were undecided. Majority of the respondent agreed the cost of production for area of tea harvested highly affects the competitiveness of the organization (mean of 4.69) and deviation in competitiveness due to cost of production for area of tea harvested was low (standard deviation of 0.66).

Regarding safety incidences related to company operations has an impact on the competitiveness of the organization, 45(83.3%) respondents strongly agreed, 7(13%) agreed and 2(3.7%) were undecided. Majority of the respondent agreed that the safety incidences related to company operations has effect on the competitiveness of the organization (mean of 4.76) and the variation in competitiveness was low (standard deviation of 0.642).

About 47(87%) respondents strongly agreed that the level of tea production in yield per hectare influences the competitiveness of the organization, 6(11.1%) agreed and 1(1.9%) strongly disagreed. High number of respondents agreed that the level of tea production in yield per hectare largely influences the competitiveness of the organization (mean of 4.8) and the variation in competitiveness due to the level of tea production in yield per hectare was low (standard deviation of 0.617).

On whether productivity, cost, safety and production directly affect the competitiveness of an organization, 44(81.5%) respondents strongly agreed, 8(14.8%) agreed, 1(1.9%) disagreed and 1(1.9%) strongly disagreed. Respondents agreed that productivity, cost, safety and production directly affect the competitiveness of an organization (mean of 4.77) and the variation in competitiveness due to productivity, cost, safety and production was low (standard deviation of 0.644). According to Niță

& Dura (2011) competitiveness is a general indicator that shows the level of stability and resistance of the company to internal and external environment challenges, challenges that are becoming increasingly acute due to the manifestation of the globalization phenomenon and to the expansion of activities of many companies beyond the borders of their country. The argument corroborates the findings of the current study.

4.4 Regression analysis

The regression analysis of the study sought to bring out how dependent variable, competitiveness, is affected by the independent variables which are planting strategy, tea harvesting strategy, cutting strategy and input application strategy.

Table 4.12: Analysis of coefficient of determination Using SPSS version 24

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.536 ^a	.287	.227	.435	.287	4.828	4	48	.002	1.791

a. Predictors: (Constant), input application strategy, harvesting strategy, planting strategy, cutting strategy

b. Dependent Variable: Competitiveness

Source: Survey Data 2019

Table 4.12 shows that, a correlation coefficient of 0.536^a show a fairly weak linear relationship or dependence of competitiveness and technology-based strategy. A coefficient of determination (R-square) of 0.287, indicate that technology-based strategy explain 28.7% variation in competitiveness of the selected multinational tea companies in Kericho and Bomet Counties, Kenya. The remaining 71.3% can be explained by other factors such as government regulation and taxation policies, packaging of the tea, taste and preference of customers, marketing not considered in the current study.

Table 4.13: Analysis of Variance (ANOVA)

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	3.659	4	.915	4.828	.002 ^b
Residual	9.096	48	.189		
Total	12.755	52			

a. Dependent Variable: Competitiveness

b. Predictors: (Constant), input application strategy, harvesting strategy, planting strategy, cutting strategy

Analysis of Variance (ANOVA) is computed by summing the squared differences between each variable and the overall sample mean. Analysis of Variance was used to test the significance of the regression model as pertains to significance in the differences in means of the dependent and independent variables, which in this case is competitiveness and the planting strategies respectively. The ANOVA test produced an F-value of 4.828 which was significant at 0.05 and the significance value ($p = 0.002^b$). Therefore, since p is less than 0.05, the regression model is significant at 95% confidence level. The regression model statistically significantly predicts the outcome variable. Therefore, the technology-based strategies are significant on the competitiveness of an organization.

From the analysis and finding shown in table 4.14, the p value was planting strategy was 0.222, which was greater than 0.05, hence not significant, harvesting strategy posted a p value of 0.443 hence not significant, cutting strategy posted a p value of 0.000, which was less than 0.05 which was very significant and input application strategy p value was 0.401 which was not significant. The study therefore, showed that more emphasis to be placed on cutting strategies as it has more impact on the competitiveness of multinational corporations.

Table 4.14: Analysis of Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.490	.706		4.943	.000
1 Planting strategy	-.137	.111	-.159	-1.236	.222
Harvesting strategy	.094	.121	.100	.773	.443
cutting strategy	.377	.092	.530	4.106	.000
input application strategies	-.075	.088	-.106	-.847	.401

a. Dependent Variable: Competitiveness

Source: Survey Data 2019

Table 4.12 gives the coefficients of the regression model

$$y = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \beta_4x_4 + e$$

y = organizational competitiveness

β_0 = constant term; the value of the dependent variable when all the independent variables are 0

x_1 = Planting Strategies

x_2 = Harvesting Strategies

x_3 = Cutting Strategies

x_4 = Input application Strategies

e= error term

Therefore,

$$y = 3.490 - 0.137x_1 + 0.094x_2 + 0.377x_3 - 0.075x_4 + e$$

When all the other variables are kept constant, a unit change in planting strategy causes a decrease in competitiveness of an organization by 0.137 units. The focus of the study was on the mechanical tea planting with the following aspects being under scrutiny, the number of days required to complete task on large scale planting of tea, the number of tea plants planted per man a day when the mode of planting is mechanized and the number of people required to complete task when using

mechanical machines in tea planting, these factors proved by the study are a bit detrimental to the competitiveness of the organization. Therefore, corporations need to consider these factors and keep them at a minimal for them to consider being competitive as the study found out that planting strategy are crucial to the competitiveness of the corporations in the greater market.

A unit change in harvesting strategy produces an increase of 0.094 units in competitiveness of an organization, other factors remaining constant. The study focus was on the number of employees required to harvest a given area of tea using machines, tea harvested by an individual employee when using mechanical harvesting in terms of weight, employees' earnings when using mechanical harvesting and crop yield when using mechanical tea harvesting machines. The study found out that these factors played a crucial part in enhancing the overall competitiveness of the tea corporations. The findings of this study are in agreement with the recommendation of Koske (2013) that mechanical tea plucking is highly recommended for adoption on the strengths of their high productivity indices which translates to higher profitability compared with the conventional hand plucking.

A unit change in cutting strategy causes an increase of 0.377 units in competitiveness of and organization, other factors held constant. The study focused on the number of reported cases of accidents during pruning operation while using mechanical tea pruning machines, the number of tea bushes cut per person, the number of cutting tools required for pruning a given area of tea and the number of employees required to prune a given area of tea. The study found out these activities have a bearing to the competitiveness of the corporation as it tends to reduce wage bills and cases of accidents reported.

A unit change in input application produces a decrease of 0.075 units in competitiveness of the organization, other factors held constant. Fertilizer and lime

application are crucial as tea under regular plucking has to get nutrients supplemented in the form of fertilizers and/or manures to continue to give high yields (Owuor, Kavoi, Wachira & Ogola, 2007). The mechanization of input application will see the corporation's performance in the market go up as found by the study.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

This research study sought to determine the role of technology-based strategies in competitiveness of the selected multinational tea companies in Kericho and Bomet Counties, Kenya. The study was guided by the following research objectives: To investigate the effect of planting strategy on competitiveness of the selected multinational tea companies in Kericho and Bomet Counties, Kenya., to determine the effect of tea harvesting strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya, to analyze the effect of cutting strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya and to assess the effect of input application strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya. The study used a descriptive research design. The study targeted 54 respondents and all of them responded. The study used primary data which was collected using structured and semi-structured questionnaires. The collected data was entered into the computer using Statistical Package for Social Sciences (SPSS) version 21 where a database was created and analyzed. Both quantitative and qualitative data was generated. Descriptive statistics was used to analyze quantitative data by using frequencies and percentages presented in tables, charts and graphs. From the analysis, the findings stated below were made.

5.1.1 Effect of Planting Strategy on competitiveness

The first objective of the study sought to investigate the effect of planting strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet

Counties, Kenya. The researcher investigated on whether, large scale planting of tea using mechanical machinery affects the number of days required to complete task, the number of tea plants planted per man day is higher when the mode of planting is mechanical, the use of mechanical machines in tea planting reduces the number of people required to complete task, Mechanical tea planting influences the survival rate of plants and planting strategies influence competitiveness.

Majority of the respondent strongly agreed that large scale planting of tea using mechanical machinery affects the number of days required to complete task. This can be concluded that it takes mechanical machinery a shorter period of time to complete a task that is assigned, hence allowing for the companies to further their interest in other field aspects. The study also found out that majority of the respondents agreed that mechanical planting is fast compared to the planting done by man in a day. Majority of the respondents agreed that using mechanical machines to plant tea reduces the number of people required to complete task.

Majority of the respondent agreed that the survival rate of plants is influence by mechanical tea planting. This is because mechanical planting is set to facilitate planting with the right amount of space and depth and the plant handling is standard therefore minimizing the chances of the plant dying. The finding indicated that majority of the respondents agreed that planting strategies influence competitiveness. Planting strategies are significant on the competitiveness of an organization.

5.1.2 Effect of Harvesting Strategy on competitiveness

The second objective of the study sought to determine the effect of tea harvesting strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya. The researcher investigated the following aspects: Use

of machines in tea harvesting directly affects the number of employees required to harvest a given area of tea, Kilos of tea harvested by an individual employee is higher when using mechanical harvesting that when manual harvesting is used, Employees' earnings are higher with mechanical harvesting than in manual harvesting, Crop yield is higher with the use of mechanical tea harvesting machines and Harvesting strategies play a crucial role in competitiveness

All the respondents agreed that use of machines in tea harvesting directly affects the number of employees required to harvest a given area of tea. This is because machines for a long time has been known to make work easier. This translates to the number of employees; the easier the work the less the number required to complete the task. The findings of the study also showed that majority of the respondent agreed that in mechanical harvesting the kilos of tea harvested by an individual employee is higher than when manual harvesting is used, as machine are known to work smart and faster compared to the manual labour. This translated to the majority of the respondent agreeing that employees earn higher with mechanical harvesting than in manual harvesting.

The study also found out that majority of the respondents agreed that crop yield is higher with the use of mechanical tea harvesting machines. Majority of the respondents agreed that harvesting strategies play a crucial role in competitiveness.

5.1.3 Effect of Cutting Strategy on competitiveness

The third objective of the study sought to analyze the effect of cutting strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya. The researcher looked at the following aspects; Use of mechanical tea pruning machines has influenced the number of reported cases of accidents during

pruning operation, the cutting machine used during tea pruning affects the number of tea bushes cut per person, the use of pruning machine reduces the number of days to prune a given area of tea, mode of cutting determines the number of cutting tools required for pruning a given area of tea, mechanical pruning reduces the number of employees required to prune a given area of tea and competitiveness is a function of cutting strategies.

Majority of the respondent agreed mechanical tea pruning machines has influenced the number of reported cases of accidents during pruning operation. Majority of the respondent agreed that cutting machine used during tea pruning affects the number of tea bushes cut per person. All the respondents agreed that the use of pruning machine reduces the number of days to prune a given area of tea. Majority of the respondent agreed that the mode of cutting determines the number of cutting tools required for pruning a given area of tea.

All the respondent agreed that mechanical pruning reduces the number of employees required to prune a given area of tea. Majority of the respondent agreed that competitiveness is a function of cutting strategies.

5.1.4 Effect of Input Application Strategy on competitiveness

The fourth objective of the study sought to assess the effect of input application strategy on competitiveness of the selected Multinational Tea Companies in Kericho and Bomet Counties, Kenya. The researcher looked at the following aspects; aerial application of fertilizer to tea improves the amount of green leaf that can be harvested from a given area, aerial application of fertilizer improves the spread of the amount of fertilizer per tea bush, number of employees required for fertilizer application is less when aerial means is used, days of fertilizer operations are less in aerial application

than in manual method, competitiveness is directed by the input strategies used in fertilizer application, lime application by mechanical means positively impacts on the health of the plants planted, use of mechanical lime application method improves the distribution of lime in a given area, mechanical lime application requires less labour than manual application, mode of lime application affects the days required to complete task and competitiveness is directed by the input strategies used in lime application.

Majority of the respondent agreed that that aerial application of fertilizer to tea improves the amount of green leaf that can be harvested from a given area. The study further found out that majority of the respondent agreed that aerial application of fertilizer improves the spread of the amount of fertilizer per tea bush.

All the respondent agreed the number of employees required for fertilizer application is less when aerial means is used and that the days of fertilizer operations are less in aerial application than in manual method. Further study findings showed that despite this strategy being faster with less labour use, it is a very expensive method. However, due to the guaranteed amounts and uniform spread of the fertilizers per tea plant, the yields are higher than when manual application method is used. The majority of the respondents therefore agreed that competitiveness is directed by the input strategies used in fertilizer application.

Majority of the respondent agreed that lime application by mechanical means positively impacts on the health of the plants planted and that the use of mechanical lime application method improves the distribution of lime in a given area.

The fact that few people can operate a machine that applies the lime, majority of the respondent agreed that the labour required in mechanical lime application is less than

manual application and that the mode of lime application affects the days required to complete task. The study found out that majority of the respondent agreed that competitiveness is directed by the input strategies used in lime application.

5.2 Conclusions

The results show that the technology-based strategy, that is, planting strategy, harvesting strategy, cutting strategy and input application strategy implemented by the companies is very crucial to the to their competitiveness. It was therefore concluded that adoption of all the strategies, that is planting, harvesting, cutting and input application in their mechanized form is important as they play a role in putting the final product of the company on the competitive edge in the market. From the findings of the study, it is recommended that adopting of the technology-based strategy to have the multinational companies compete fairly in the market in as the whole process right from preparing the field to having the final product is a chain that is very connected. The study concludes that technology- based strategies remains the top operations competitive priority for MNCs in Kenya. This is in agreement with the studies by Muzamil et al (2012) in Malaysian service industry and Kathuria et al (2010) in Indian manufacturing sector who found out that quality remains the top competitive priority. However, the sequence of emphasis of competitive priorities differed. Muzamil et al (2012) found out that quality came first followed by delivery, flexibility and cost. Kathuria et al (2010) found out that quality came first followed by delivery then cost and flexibility.

5.3 Recommendations

The study shows that regardless of which technology-based strategy an organization has adopts, there is an aspect of competitiveness achieved through increased

efficiency. However expensive operationalizing the technologies is, positive gains are more as there are associated benefits in productivity, cost, safety and production capacity. The study therefore recommends adoption of technology-based strategies for multinational companies to remain competitive in the market.

Study findings indicate that the introduction of technology-based strategies have high cost benefit due to reduction of manual labour used in the production value chain. Organizations should therefore have clear manpower-machinery replacement policies for any new technology.

Due to the vastness of the estates and the sensitivity of operations and labor related issues, this study from its findings recommends use of digital data collection tools to enhance confidentiality and ease of response from large estate workers. Digital data collection gives more response flexibility.

As evident during data collection, multinational tea companies have fear of exposure. The researcher therefore recommends review of government policies affecting multinationals. MNCs should propose for the introduction of government policies protecting mechanization in agricultural multinationals while at the same time managing the welfare of the communities they operate in.

5.4 Recommendations for Further Research

Research findings indicate that only 28.7% variation in competitiveness of the selected multinational tea companies can be explained. Further research on other factors affecting competitiveness of MNCs should therefore be studied. Such factors could include government regulation and taxation policies, product packaging and marketing strategy, taste and preference of customers which have not been covered in this study.

A study assessing government restrictions on the adoption of new technologies in MNCs is recommended. The study should analyze the effect of government restrictions on competitiveness of the MNCs. The aim of the study should be to show how government limitations affect maximum utility of available technologies in multinational companies. This has not been covered in this study.

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APPENDICES

Appendix I: Letter of Introduction

DORNAH CHERONO BOR

KENYATTA UNIVERSITY.

Dear Sir/Madam,

RE: REQUEST TO COLLECT DATA

I am a post-graduate student at Kenyatta University pursuing a master of business administration in strategic management.

As part of the requirement for the course, I am required to undertake a research project relevant to my area of study. I therefore write to request for your permission to collect data in your company. My research project will seek to assess the **‘TECHNOLOGY BASED STRATEGIES AND COMPETITIVENESS OF SELECTED MULTINATIONAL TEA COMPANIES IN KERICHO AND BOMET COUNTIES, KENYA’**. I have attached authorization letters from Kenyatta University, National Commission for Science, Technology and Innovation, County Commissioners and County Directors of Education, Kericho and Bomet Counties, the abstract of my area of research and a copy of the questionnaire.

The information provided was used for academic purposes only and was treated with utmost confidentiality it deserves. Thanks in advance.

Yours sincerely

Dornah C. Bor

Appendix II: Questionnaire

SECTION A: BACKGROUND INFORMATION

1	Gender	Male Female	<input type="checkbox"/> <input type="checkbox"/>	Select the most appropriate
2	Age bracket	18-20 21-25 26-30 >30	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Select the most appropriate.
3	How long have you been working with this organization?			State the length service in multinational tea company
4	Position held	Top level management Administrative staff Supervisor Support staff	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Select the most appropriate.
5	Highest academic level attained	Primary O-Level/Secondary College Any other (specify)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Select one
6	Does your job require skills to carry out tasks?	Yes No	<input type="checkbox"/> <input type="checkbox"/>	Select one
7	If yes to question 6, are these skills trained or acquired?	Trained Acquired	<input type="checkbox"/> <input type="checkbox"/>	Select one
8	If trained, was training done by the employer or personal?	Employer Personal	<input type="checkbox"/> <input type="checkbox"/>	Select one

SECTION B: TECHNOLOGY BASED STRATEGIES

The statements below relate to the technology-based strategies of multinational tea companies. The responses are rated in likert scale as follows; Strongly Agree (SA) = 5, Agree (A) = 4, Undecided (U) = 3, Disagree (D) = 2 and Strongly Disagree (SD) = 1. Please select the appropriate scale by ticking on the provided space.

1. Planting Strategies	5	4	3	2	1
Large scale planting of tea using mechanical machinery affects the number of days required to complete task					
The number of tea plants planted per person is higher when the mode of planting is mechanical					
Use of mechanical machines in tea planting reduces the number of people required to complete task					
Mechanical tea planting influences the number of seedlings that survive after planting					
Planting strategies influence competitiveness					
How else has mechanical planting impacted on the performance of the organization?					

2. Harvesting Strategies	5	4	3	2	1
Use of machines in tea harvesting directly affects the number of employees required to harvest a given area of tea					
Kilos of tea harvested by an individual employee is higher when using two man mechanical harvesting that when manual harvesting is used					
Employees' earnings are higher with one man mechanical harvesting machine than in manual harvesting					
Crop yield is higher with the use of mechanical tea harvesting machines					
Harvesting strategies play a crucial role in competitiveness					
In what other ways do you think mechanical tea harvesting has influenced the competitiveness of the organization?					

3. Cutting Strategies	5	4	3	2	1
Use of mechanical tea pruning machines has influenced the number of reported cases of accidents during pruning operation					
The cutting machine used during tea pruning affects the number of tea bushes cut per person					
The use of pruning machine reduces the number of days to prune a given area of tea					
Mode of cutting determines the number of cutting tools required for pruning a given area of tea					
Mechanical pruning reduces the number of employees required to prune a given area of tea					
Competitiveness is a function of cutting strategies					
What other effects has mechanical pruning had on the performance of the organization?					

4. Input Strategies					
i. Aerial fertilizer application	5	4	3	2	1
Aerial application of fertilizer to tea improves the amount of green leaf that can be harvested from a given area					
Aerial application of fertilizer improves the spread of the amount of fertilizer per tea bush					
Number of employees required for fertilizer application is less when aerial means is used					
Days of fertilizer operations are less in aerial application than in manual method.					
Competitiveness is directed by the input strategies used in fertilizer application					
In your opinion, how has aerial fertilizer application contributed to the competitiveness of the organization?					
ii. Mechanical lime application	5	4	3	2	1
Lime application by mechanical means positively impacts on the health of the plants planted					
Use mechanical lime application method improves the distribution of lime in a given area					
Mechanical lime application requires less labour than manual application					
Mode of lime application affects the days required to complete task					
Competitiveness is directed by the input strategies used in lime application					
What influence do you think mechanical lime application has had on the competitiveness of your organization?					

5. Additional Information
State any other ways in which technology has influenced the performance of this organization.

SECTION C: COMPETITIVENESS

Choose an appropriate linkert scale from 5-1 with Strongly Agree (SA) = 5, Agree (A) = 4, Undecided (U) = 3, Disagree (D) = 2 and Strongly Disagree (SD) = 1, by ticking on the provided space.

	Competitiveness	5	4	3	2	1
2	The level of productivity per man day in tea harvesting influences the competitiveness of the organization					
3	The cost of production for area of tea harvested affects the competitiveness of the organization					
4	Safety incidences related to company operations has an impact on the competitiveness of the organization					
5	The level of tea production in yield per hectare influences the competitiveness of the organization					
6	Productivity, cost, safety and production directly affects the competitiveness of an organization					
7	Give any additional information on the factors that you think have impacted on the competitiveness of this organization.					

Thank you for filling in the questionnaire.

Appendix III: Research Authorization from Kenyatta University Graduate School



**KENYATTA UNIVERSITY
GRADUATE SCHOOL**

E-mail: dean-graduate@ku.ac.ke

Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 810901 Ext. 4150

Internal Memo

FROM: Dean, Graduate School

DATE: 20th May, 2019

TO: Dornah Cherono Bor
C/o Business Administration Dept.

REF: DSS/KER/PT/33342/2014

SUBJECT: APPROVAL OF RESEARCH PROPOSAL

We acknowledge receipt of your revised Research Proposal as per our recommendations raised by the Graduate School Board of 6th March, 2019 entitled "Technology based strategies and competitiveness of selected multinational tea companies in Kericho and Bomet Counties Kenya".

You may now proceed with your Data Collection, Subject to Clearance with Director General, National Commission for Science, Technology and Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking Forms per semester. The form has been developed to replace the Progress Report Forms. The Supervision Tracking Forms are available at the University's Website under Graduate School webpage downloads.

Thank you,

**ANNBELL MWANIKI
FOR: DEAN, GRADUATE SCHOOL**

C.C. Chairman, Department of Business Administration

Supervisors:

1. Dr. Kipkorir Sitienei Chris Simon
C/o Department of Business Administration
Kenyatta University

Appendix IV: Research Authorization Letter to NACOSTI



KENYATTA UNIVERSITY GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke

Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 8710901 Ext. 57530

Our Ref: D53/KER/PT/33342/2014

DATE: 20th May, 2019

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR DORNAH CHERONO BOR- REG. NO. D53/KER/PT/33342/2014.

I write to introduce Dornah Cherono Bor who is a Postgraduate Student of this University. The student is registered for MBA degree programme in the Department of Business Administration.

Dornah intends to conduct research for a MBA Project Proposal entitled, "Technology based strategies and competitiveness of selected multinational tea companies in Kericho and Bomet Counties Kenya".

Any assistance given will be highly appreciated.

Yours faithfully,


PROF. ELISHIBA KIMANI
AG. DEAN, GRADUATE SCHOOL

Appendix V: Research Authorization from NACOSTI



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349,3310571,2219420
Fax: +254-20-318245,318249
Email: dg@nacosti.go.ke
Website : www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box, 30623-00100
NAIROBI-KENYA

Ref No. **NACOSTI/P/19/64264/31454**

Date: **31st July, 2019.**

Dornah Cheronno Bor
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *“Technology based strategies and competitiveness of selected multinational tea companies in Kericho and Bomet Counties, Kenya.”* I am pleased to inform you that you have been authorized to undertake research in **Bomet and Kericho Counties** for the period ending **29th July, 2020.**

You are advised to report to **the County Commissioners, and the County Directors of Education, Bomet and Kericho Counties** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

**GODFREY P. KALERWA, MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO**

Copy to:

The County Commissioner
Bomet County.

The County Director of Education
Bomet County.

Appendix VI: NACOSTI Research License

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013

The Grant of Research Licenses is guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014.

CONDITIONS

1. The License is valid for the proposed research, location and specified period.
2. The License and any rights thereunder are non-transferable.
3. The Licensee shall inform the County Governor before commencement of the research.
4. Excavation, filming and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
5. The License does not give authority to transfer research materials.
6. NACOSTI may monitor and evaluate the licensed research project.
7. The Licensee shall submit one hard copy and upload a soft copy of their final report within one year of completion of the research.
8. NACOSTI reserves the right to modify the conditions of the License including cancellation without prior notice.

National Commission for Science, Technology and innovation
P.O. Box 30623 - 00100, Nairobi, Kenya
TEL: 020 400 7000, 0713 788787, 0735 404245
Email: dg@nacosti.go.ke, registry@nacosti.go.ke
Website: www.nacosti.go.ke



REPUBLIC OF KENYA



National Commission for Science, Technology and Innovation

RESEARCH LICENSE

Serial No.A 26251

CONDITIONS: see back page

THIS IS TO CERTIFY THAT:

MISS. DORNAH CHERONO BOR of KENYATTA UNIVERSITY, 0-20200 kericho, has been permitted to conduct research in Bomet , Kericho Counties

on the topic: TECHNOLOGY BASED STRATEGIES AND COMPETITIVENESS OF SELECTED MULTINATIONAL TEA COMPANIES IN KERICHO AND BOMET COUNTIES, KENYA


for the period ending: 29th July,2020


.....
Applicant's Signature




.....
**Director General
National Commission for Science, Technology & Innovation**

Appendix VII: Research Authorization from Bomet County Commissioner


OFFICE OF THE PRESIDENT
MINISTRY OF INTERIOR AND COORDINATION OF NATIONAL GOVERNMENT

Telegrams: "DISTRICTER", Bomet
Telephone: (052) 22004/22077 Fax 052-22490
When replying please quote

COUNTY COMMISSIONER
P.O BOX 71- 20400
BOMET


REF: EDU 12/I VOL.III/(168) 30th August, 2019

The Deputy County Commissioners
BOMET

RE: RESEARCH AUTHORIZATION – DORNAH CHERONO BOR

The above named person has been authorized to carry out research on "*Technology based strategies and competitiveness of selected multinational tea companies in Kericho and Bomet Counties, Kenya.*" by the National Commission for Science, Technology and Innovation vide their letter Ref. No. NACOSTI/P/19/64264/31454 dated 31st July, 2019 for the period ending 29th July, 2020.

Any assistance accorded would be appreciated.


Nereah Kotonya
For: County Commissioner
BOMET

COUNTY COMMISSIONER
BOMET COUNTY
30 AUG 2019
P. O. Box 71-20400, BOMET

c.c.

Dornah Cheronu Bor
Kenyatta University
P O Box 43844-00100
NAIROBI

Appendix VIII: Research Authorization from Kericho County Commissioner



**OFFICE OF THE PRESIDENT
MINISTRY OF INTERIOR AND CO-ORDINATION OF NATIONAL GOVERNMENT**

Telegrams:
Telephone: Kericho 20132
When replying please quote
kerichocc@yahoo.com

THE COUNTY COMMISSIONER
KERICHO COUNTY
P.O. BOX 19
KERICHO

REF: MISC.19 VOL.IV/08

26th August, 2019

Dornah Cheron Bor
Kenyatta University
P.O. Box 43844-00100
NAIROBI

RE: RESEARCH AUTHORISATION

I am pleased to inform you that you are authorized to undertake research as per the letter Ref. No. NACOSTI/P/19/64264/31454 dated 31st July, 2018 on ***“Technology based strategies and competitiveness of selected multinational tea companies in Kericho and Bomet Counties, Kenya”*** for a period ending 29th July, 2019.

Any assistance accorded to her is highly appreciated.

COUNTY COMMISSIONER
KERICHO COUNTY

Ezekiel Amonde
FOR: COUNTY COMMISSIONER
KERICHO COUNTY

CC: County Director of Education
KERICHO

Appendix IX: Research Authorization from the Ministry of Education, Bomet County



**REPUBLIC OF KENYA
MINISTRY OF EDUCATION
STATE DEPARTMENT OF EARLY LEARNING AND BASIC EDUCATION**

Telegrams: "ELIMU",
Telephone: 052-22265
When replying please quote
email: cdebometcounty@gmail.com
Ref/CDE/BMT/ED/AUTH/74/VOL.II/9

COUNTY EDUCATION OFFICE,
BOMET COUNTY,
P.O. BOX 3-20400,
BOMET.

28TH AUGUST, 2019

Dornah Cherono Bor
Kenyatta University
P.o Box 43844-00100,
NAIROBI.

RE: RESEARCH AUTHORIZATION.


Reference is made to yours from NACOSTI Ref: No NACOSTI/P/19/64264/31454 dated 31st July, 2019 on the above subject.

Permission is hereby granted to carry out research on "*Technology based strategies and competitiveness of selected multinationals tea companies in Kericho and Bomet Counties*" Kenya, for the period ending 29th July, 2020.

Ensure, you present a copy of the research to County Director of Education-Bomet

This letter should be presented to the principal of the schools visited for the said purpose.

COUNTY DIRECTOR OF EDUCATION
BOMET
P.O. BOX 3-20400, BOMET

PP 
**INDIATSO MABALE
COUNTY DIRECTOR OF EDUCATION
BOMET COUNTY.**

**CC
DIRECTOR NACOSTI**

Appendix X: Research Authorization from the Ministry of Education, Kericho County



MINISTRY OF EDUCATION
STATE DEPARTMENT OF EARLY LEARNING AND BASIC EDUCATION

Email: cdekerichocounty@gmail.com
When Replying Please Quote:

County Education Office
P.O BOX 149
KERICHO

REF: KER/C/ED/GC/2/VOL.II/

23RD AUGUST, 2019.

TO WHOM IT MAY CONCERN.

RE: RESEARCH AUTHORIZATION.
DORNAH CHERONO BOR.

The above student has been authorized by the National Commission for Science, Technology and innovation to undertake research on "*Technology based strategies and competitiveness of selected multinational tea companies in Kericho and Bomet Counties, Kenya*", for the period ending 29th July, 2020.

Kindly accord her the necessary assistance.


ZACHARY MUTURI
COUNTY DIRECTOR OF EDUCATION
KERICHO COUNTY.

