

**FACILITY LOCATION AND SUPPLY CHAIN PERFORMANCE OF
THE MOBILE TELECOMMUNICATION FIRMS IN KENYA**

BY

KABENA JESSIE NGANDU : D61/75376/2012

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DECLARATION

This Research Project is my original work and has not been presented for a degree in any other university.

Signed: Date:

Kabena Jessie Ngandu

D61/75376/2012

This Research Project has been submitted for examination with my approval as the University Supervisor.

Signed: Date:

Kariuki C. Ngugi,

Lecturer, Department of Management Science

DEDICATION

First and foremost to God Almighty, the creator of everything for granting me life and giving me the ability to achieve this research project; I owe you this victory. You have always been with me even when this journey seemed unbearable; you gave me a special anointing to start and to finish. Receive all the Glory. To my beloved husband Daniel Kaboto, and my kids Jeda, Samuel and Anthony Kaboto, you have been fully my sponsor in everything, your morale, financial and spiritual support was so unbelievable, even when I was almost to give up with this program, you believed in me and trusted that I can make it. I dedicate this project to you.

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TABLE OF CONTENTS

| | |
|--|-------------|
| DECLARATION | ii |
| DEDICATION | iii |
| ACKNOWLEDGEMENTS | iv |
| TABLE OF CONTENTS | v |
| LIST OF TABLES AND FIGURES..... | vii |
| ABBREVIATIONS AND ACRONYMS..... | viii |
| ABSTRACT..... | ix |
| CHAPTER ONE: INTRODUCTION | 1 |
| 1.1 Background of the Study | 1 |
| 1.2 Statement of the Problem..... | 6 |
| 1.3 Objectives of the Study..... | 8 |
| 1.4 Importance of the Study..... | 8 |
| CHAPTER TWO: LITERATURE REVIEW | 10 |
| 2.1 Introduction..... | 10 |
| 2.2 Theoretical Framework..... | 10 |
| 2.3 Facility Location | 11 |
| 2.4 Supply Chain Performance | 13 |
| 2.5 Facility Location and Supply Chain Performance of the Mobile Telecommunication Firms . | 15 |
| 2. 6 Summary and Conceptual Framework..... | 18 |
| CHAPTER THREE: RESEARCH METHODOLOGY | 20 |
| 3.1 Introduction..... | 20 |
| 3.2 Research Design..... | 20 |
| 3.3 Population of the Study..... | 20 |
| 3.4 Sampling Design..... | 20 |
| 3.5 Data Collection | 21 |
| 3.6 Data Analysis | 21 |
| CHAPTER FOUR: DATA ANALYSIS AND FINDINGS..... | 23 |
| 4.1 Introduction..... | 23 |
| 4.2 Profile of Respondents..... | 23 |
| 4.3 Facility Location Decisions | 25 |
| 4.4 Facility Location and Supply Chain Performance | 35 |
| 4.5 Discussion of Results..... | 40 |

| | |
|---|-----------|
| CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS | 42 |
| 5.1 Introduction..... | 42 |
| 5.2 Conclusions..... | 42 |
| 5.3 Recommendations..... | 43 |
| 5.4 Limitations of the Study..... | 45 |
| 5.5 Suggestions for further Research | 45 |
| REFERENCES..... | 47 |
| APPENDICES | 51 |
| Appendix I: Introduction Letter | 51 |
| Appendix II: Research questionnaire..... | 52 |
| Appendix III: List of Mobile Telecommunication Firms in Kenya | 57 |

LIST OF TABLES AND FIGURES

| | |
|---|----|
| Figure 2.1: Conceptual Framework | 19 |
| Table 4.1: Distribution of Respondents per Telecommunication Company | 23 |
| Table 4.2: Distribution of Respondents by Length of Service in the Companies | 24 |
| Table 4.3: Distribution of Respondents by role in determining facility Location | 25 |
| Table 4.4: Effect of Proximity to Customers on Facility location Decisions | 26 |
| Table 4.5: Effect of Proximity to Suppliers on Facility location Decisions | 27 |
| Table 4.6: Effect of Infrastructure on Facility location Decisions | 28 |
| Table 4.7: Effect of Quality of Labour on Facility location Decisions | 30 |
| Table 4.8: Effect of Operational Costs on Facility location Decisions | 31 |
| Table 4.9: Effect of Government policy and Regulations on Facility location Decisions | 32 |
| Table 4.10: Other Factors affecting facility location decisions | 34 |
| Table 4.11: Correlation of Facility Location Factors and Supply Chain Performance | 36 |
| Table 4.12: Model Summary | 37 |
| Table 4.13: ANOVA | 38 |
| Table 4.14: Regression Coefficients | 39 |

ABBREVIATIONS AND ACRONYMS

| | |
|--------------|-----------------------------------|
| ANOVA | Analysis of Variance |
| CAK | Communication Authority of Kenya |
| CCK | Communication Commission of Kenya |
| CK | Constitution of Kenya |
| KPIs | Key Performance Indicators |
| SCM | Supply Chain Management |

ABSTRACT

In Kenya today, most mobile telecommunication operators situate their business mainly in Nairobi, the capital city. What leads these mobile telecommunication firms to situate their businesses in Nairobi? What factors lead to such business decisions and how do they affect the supply chain performance of the mobile telecommunication firms? This study in addressing the research questions had two main objectives of establishing the factors considered in facility location decisions of the mobile telecommunication firms in Kenya and determine the relationship between facility location factors and the supply chain performance of mobile telecommunication firms in Kenya.

This study was a census of the mobile telecommunication operators in Kenya since they were only four focusing on what they consider to be influencing the location of their firms across Kenya. Primary data was collected from the respondents through questionnaires, observations and literature. A total of 20 questionnaires were sent and administered out of which, 19 responded and 1 did not respond giving an encouraging response rate of 95% and only 5% non-response rate. Secondary data from websites, firm documents and direct observations of the industry validated the primary data. Data collected was analyzed using descriptive statistics, ANOVA, regression and correlation analysis in order to address the research objectives.

Research findings showed that 63% of the respondents who included managers had no role in determining the location of a facility while 37% had a role in determining the location of a facility. Further findings indicated that proximity to customers influenced facility location decisions of mobile telecommunication firms in Kenya to a large extent. Other findings were that proximity to suppliers affects facility location decisions of the mobile telecommunication firms in Kenya to a large extent and that overall, infrastructure affect affects their facility location decisions to a large extent.

The research recommends that mobile telecommunication facilities should be located close to factors that affect supply chain performance and also the government as the regulator maintain low and competitive operational costs to encourage investments in the mobile telecommunication sector in the country. On whether the data showed any relationship between facility location factors and supply chain performance, it was revealed that proximity to customers therefore had the highest effect on supply chain performance, followed by infrastructure, then government policy, quality of labour and operational costs while proximity to suppliers has the lowest effect on supply chain performance of mobile telecommunication firms in Kenya. The research findings therefore addressed the questions and objectives of the study.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

The facility location is to do with the choice of a geographical area in a given space. All types of organization will face this problem to some extent and at sometimes though their objectives will differ (Heizer and Render, 1998). Plant location or the facility location problem is an important strategic level decision for an organisation as averred by Kumar et al. (2009). The locality of a business may influence how that business performs in an industry. There are a number of factors that business owners may consider in locating a business and those factors either enhance business performance or hinder the realization of the objective of such firms. The management of organizations have to be smart in analysing environmental and industry factors that influence choice of locality in order to be able to attain its supply chain objectives and enhance business performance.

The industry location theory by Webber (1909) is concerned with the geographic location of an economic activity. It has become an integral part of economic geography, regional science, and spatial economics. Location theory addresses the questions of what economic activities are located where and why. The Game theory which is a study of mathematical models of conflict and cooperation between intelligent rational decision-makers in this case, firms and as advanced by Neumann and Morgenstern (1947) in that modern game theory began with the idea regarding the existence of mixed-strategy equilibria in two-person zero-sum games.

In a recent research by Budde (2014), it was noted that the telecommunication industry in Kenya has grown rapidly over the past fifty years. It has seen the transformation from fixed line telephony to sprawling mobile telephone and seen an influx of both local and international players investing the once government controlled telecommunication industry. At the moment there are four (4) major investor groups in the country operating the mobile telecommunication industry. According to Communication Commission of

Kenya (CCK) now Communication Authority of Kenya (CAK, 2014), the mobile telecommunication firms, with the cut-throat competition has seen the importance of innovative marketing strategies as well facility location consideration in order to maximize profitability while minimizing operational costs.

1.1.1 Facility Location

Determining the location of a facility is among key issues and decisions in supply chain management. The location of a business has been a major concern of many authors. Head and Mayer (2003) asserted that the location decision is a function of demand in a specified area, weighted by accessibility to consumers. Today mobile telecommunication firms are performing many different transactions and provide not only mobile telecommunication services but also mobile money services. Location of a business is the geographical region or physical address where its supply chain operations are undertaken. It plays a complex role in the supply chain activities. If not chosen correctly, it would result in heavy losses.

Facility Location is the right location for the manufacturing, plant, office facility; it will have sufficient access to the customers, workers, transportation, and various stakeholders involved in the business (Management study guide 2014). However big or small the business size is, no matter its market share, high or low, public or private organisation, a decision to locate its activities in a particular site is among the critical decision that any management team has to make in order to ensure that the location is not only profitable to a business in a short term, but also in the long run, (Heizer and Render, 1998). For commercial success, and competitive advantage; the following are the critical facilities: plant, warehouse and distribution centres, customer service centres, parking slot, office, factory, machinery, equipment and store (Kumar et al., 2009). Location decision is among key decisions areas of any operations manager in a firm. In the telecommunication sector, key facilities include the masts, customer service/repair centres, warehouse, machine, office, plant and equipment.

Murari (2010) cited by Gonda (2012) has suggested that it is very difficult to find an optimal location for a supply chain facility. Satisfying decisions are developed by approximation since there is no standard procedure. He further suggested that the first process is to define the location objectives and associated constraints. It will be important to define the objectives that drive the location process. They may include promoters, owners, employees, suppliers and customers. The second stage will include identifying the relevant decision criteria. This includes determination of the factors that will assist the organization to make a location decision, for instance, economic factors, material cost and non-economic factors such as environment.

1.1.2 Supply Chain Performance

Mabert and Venkataraman (1998) define supply chain as a network of facilities and activities that performs the functions of product development, procurement of material from suppliers, the movement of materials between facilities, the manufacturing of products, the distribution of finished goods to customers, and after-market support for sustainment. This definition fulfills the place utility of operations management. Supply chain performance is the entire chain's ability to meet end-customer needs through product availability and responsiveness on-time delivery. Supply chain performance involves both functional lines and company boundaries. Improving supply chain performance is a continuous process that requires both an analytical performance measurement system, and a mechanism to initiate steps for realizing key performance indicators (KPIs) goals. The mechanism to achieve KPIs goals is referred as KPIs accomplishment; it connects planning and execution, and builds steps for realization of performance goals into routine daily work (Coyle et al., 2003).

To measure supply chain performance, there are a set of variables that capture the impact that actual working of supply chains has on revenues and costs of the whole system. Marien and Edward (2000), state that the performance of a supply chain is determined by decisions in the areas of inventory, transportation, facilities and information. Hence these four areas are identified as drivers of supply chain performance. These variables as

drivers of supply chain performance are always derived from supply chain management practices (Stewart, 1995). Managers of organization have to achieve an improvement in their supply chains; this is achieved through continuous planning, and can be measured in the context of the following supply chain activities/processes: plan, source, make and assemble, and delivery/customer. These activities are considered at various levels of management: strategic, tactical, and operational levels, monitoring and execution (Cai et al., 2008).

1.1.3 Mobile Telecommunication Firms in Kenya

Kenya's earliest telecommunications connections to the outside world were the submarine cables linking Zanzibar, Mombasa, and Dar es Salaam laid by the Eastern & South African Telegraph Company in 1888. Internally, the construction of a telegraph network began with a 200-mile coastal line linking the port city of Mombasa with Lamu. Extension into the interior of the country began in 1896 in conjunction with the building of the railway system, forming a dual "backbone" for Kenya's communications infrastructure. The extension of the telegraph line even overtook railway construction, reaching Nairobi in 1898 and Kampala and Entebbe in Uganda in 1900. Telephone service soon followed. In 1908, the public telephone network began service in Nairobi, the capital, and in Mombasa. In Nairobi that year, only eighteen telephones subscribers were connected (Tyler and Charles, 1982).

Kenya telecommunications has seen some progress following the liberalization of the telecommunication sector in 1999. In 1999, the first mobile telephone operator, Safaricom, was launched in the country. Safaricom was owned by Telkom Kenya and Vodafone. Further progress was registered in the sector when the second mobile telephone operator was licensed in 2000. This was known as Kencell Kenya and owned by Sameer Group of companies. The mobile operator has changed ownership in 2009 and the name was changed from Zain Africa Limited to Airtel Limited in June 2010 owned by the Indian conglomerate Bharti Airtel (Web, 2014).

The sector became enterprising and more players joined. The government wholly owned Telkom ventured into mobile telephony business from fixed lines operations. Telkom wireless was launched in Kenya in April 1999 and in a very short span, a strategic partner, France Telecom joined in and Orange Telkom took over in the year 2008. The latest player in the mobile telecommunication industry is Essar Telecom Kenya network, launched in December 2008 under the brand Yu Mobile (Web, 2014).

Evidence shows that the sector is maturing fast and this is seen in the fact that the mobile operators are not only engaged in a fierce competition in growing their subscriber base and market shares but also exercise some degree of cooperation. This study will be anchored on the game theory since the mobile telecommunications firms in Kenya are characterized by both competition and cooperation among firms. The leading mobile firm in Kenya today, Safaricom has embraced cooperation with its rivals in that it offers to host the rivals gadgets on their existing masts instead of them constructing new ones. This is not only cost effective to the rivals, but it allows Safaricom to earn revenues and at the same time take care of the environment. This is an application of the game theory.

With the enactment of the Kenya Communications Act 1998 and the sectorial policy statement issued in 1999, the airwaves were literally opened. Under the policy and the spirit of the Act, competition in the entire sector is allowed in accordance with a defined market structure (CK, 1998). The mobile telecommunication industry in Kenya is regulated by Communication Commission of Kenya (CCK), today Communication Authority of Kenya (CAK). One of the core mandates of the Commission is to regulate telecommunication tariffs in Kenya. Such regulation entails the preparation of guidelines, which are designed to ensure that service providers set their tariffs within a competitive framework, thus guaranteeing optimum value for money for consumers (CAK, 2014).

Simchi et al. (2003), state that facility location decision plays an important role in supply chain planning. Firms in the Mobile Telecommunication have three planning levels in their supply chains depending on the time horizon: strategic, tactical and operational. The

strategic level deals with suppliers, plants, distribution centres, customers, collection centres and recovery plants. Melo et al. (2009) state that, most facility location decisions have a long-lasting effect on the firm. These include decisions regarding the number, location and capacities of warehouses and manufacturing plants, or the flow of material through the logistics network. This helps in establishing a clear link between location models and strategic Supply Chain Management (SCM).

1.2 Statement of the Problem

In today's business environment, customers want speed, diversity, availability, high efficiency and confidence in their mobile telecommunications operations at reasonable cost. These characteristics are critical in consideration on how the supply chain performance of firm is attained in regard to overall business outlook. In most circumstances, firms are keen to locate their business to enhance performance of the supply chain since it is central to how that business is conducted. When deciding to locate a business in a particular site, mobile telecommunication operators should consider the demographics, economics and social factors of geographical regions that will allow them to give their customers a service that exceed their expectations. The facility location problem is of major importance in all types of business. In the facility location problem, the selection of the sites where new facilities are to be established is restricted to a finite set of available candidate locations. The simplest setting of such a problem is the one in which facilities are to be selected to minimize the total (weighted) distances or costs for supplying customer demands (Ray, 2005).

Mary and Emanuel (1997) in United States of America on facility location and reliable route planning in hazardous material transportation introduced the path reliability measures for the expected number of accidents over a given planning horizon whereby two location models were introduced: the reliable 1-median and a location framework for considering multiple routes. Zeng and Fan (2005) China's telecommunications market and game theory in China, they concluded that the particularity of telecom industry requires cooperation, and only when they carry on extensive cooperation, expand market together, can they realize the win-win situation, and raise efficiency of both sides. Melo

et al (2007) on facility location and supply chain Management in Germany concluded that the role of facility location is decisive in supply chain network planning and this role is becoming more important with the increasing need for more comprehensive models that capture simultaneously many aspects that are relevant to real-life problems.

Tanser (2006) studied on methodology for optimising location of new primary health care facilities in rural communities, case of Kwazulu-Natal in South Africa. He successfully identified a locality for a new facility that would maximise the population level increase in accessibility to care. Namagembe et al., (2010) researched on collaborative relationships and SME supply chain performance. They attempted to examine the relationship between collaborative relationships and Small and Medium Enterprises (SMEs) supply chain performance in Uganda. Their study established that collaborative relationships explained 29.5 per cent of the variation in SME supply chain performance. Information sharing and incentive alignments were found to be significant predictors of SME supply chain performance while decision synchronization was not a significant predictor. These findings were important and raised implications for theory and managers of SMEs in Uganda.

In Kenya, despite the importance of facility location, very few studies have been conducted. Kamah (2012) researched on outsourcing and supply chain performance among mobile telephone service providers in Kenya. He concluded that the amount of outsourcing among mobile firms was strongly related to Operation System Responsiveness and Logistic Process Responsiveness of the supply chain, Supplier Network Responsiveness and Competitive Advantage gained from the outsourcing. Gonda (2012), on warehouse location and design decisions among large scale manufacturing firms in Nairobi, Kenya. He concluded that the factors considered in warehouse location decision include host community, proximity to market, space availability, security and utilities (such as electricity), and for warehouse design factors, available space, accessibility, safety, cost effectiveness and product type. Nyongesa (2012) studied on location decisions among commercial banks in Kenya and concluded

that the main factors that influenced the banks on its facilities location decision were: total cost factors; proximity to customers; business climate; infrastructure; and competitive advantage.

None of the studies reviewed studied facility location and the effect it has on supply chain performance of the Mobile Telecommunication Firms in Kenya. This is the research gap that this study is out to address. In Kenya today, most mobile telecommunication operators situate their business mainly in Nairobi, the capital city of the country. What then leads these mobile telecommunication firms to situate their businesses in Nairobi? What factors lead to such business decisions and how do these factors affect the supply chain performance of the firms involved in mobile telecommunication operations?

1.3 Objectives of the Study

The study will have the following objectives:

- i. To establish the factors considered in facility location decisions of the mobile telecommunication firms in Kenya,
- ii. To determine the relationship between facility location factors and the Supply Chain Performance of the Mobile Telecommunication firms in Kenya.

1.4 Importance of the Study

This study will help understand the factors that influence the location of facilities of the mobile telecommunication firms in Kenya and whether those factors contribute to a greater performance in the organizations highly competitive business environment.

The study will add to the body of knowledge on the factors to consider in locating organizations and supply chain performance of the mobile telecommunication firms in Kenya and what value if any in enhancing supply chain performance do those factors contribute to the organizations.

The survey findings will be beneficial to the management of the telecommunication industry in Kenya and the government, by using the findings to better create an enabling investment infrastructure and policies that will enhance robust growth of the mobile telecommunication firms not only in Nairobi but also in the entire country of Kenya.

The study will provide valuable information to academicians and contribute to the general body of knowledge and form a basis for further research area.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents the literature that best illustrates the information and research findings by other scholars in the area of mobile telecommunications, facility location and supply chain performance. It covers the theoretical framework, facility location, supply chain performance and the relationship between facility location and supply chain performance in the Mobile telecommunication firms in Kenya.

2.2 Theoretical Framework

Weber came up with the industry location theory in 1909 referred as deductive theory. Weber's theory was concerned with the geographic location of an economic activity and has since become an integral part of economic geography, regional science, and spatial economics. Location theory addresses the questions of what economic activities are located where and why. The location of economic activities can be determined on a broad level such as a region or metropolitan area, or on a narrow one such as a zone, neighbourhood, city block, or an individual site. Weber identified two key factors which influence the distribution of industrial units over the different regions in a country; primary and secondary. The primary factors were transport and labor cost while secondary factors included elements of cost of building new facility, labour, machines, fixed assets, power and fuel.

The deductive theory has been criticized by many economics because Weber emphasized on cost factors thereby ignoring all others factors like labor characteristics, legal and regulatory framework, social and cultural factors. Another theory that is of concern to this study is the Game theory. The Game theory which is the study of mathematical models of conflict and cooperation between intelligent rational decision-makers, in this case a firm was advanced by Neumann and Morgenstern (1947). The modern game theory began with the idea regarding the existence of mixed-strategy equilibria in two-

person zero-sum games in which one strategy is that of outcompeting with rivals in the same industry while the other strategy is to cooperate with competitors in the industry especially in areas of infrastructure and technical expertise.

Recent research by Dixit and Susan (2004) said that in these games the players choose their actions separately, but their links to others involve elements of both competition and cooperation, they concluded that a game player must recognize his interaction with other intelligent and purposive people. His own choice must allow both for conflict and for possibilities for cooperation.

2.3 Facility Location

Facility location decisions are a critical element in strategic planning for a wide range of private and public firms. The ramifications of siting facilities are broadly based and long-lasting, impacting numerous operational and logistical decisions. High costs associated with property acquisition and facility construction make facility location or relocation projects long-term investments. To make such undertakings profitable, firms plan for new facilities to remain in place and in operation for an extended time period. Thus, decision makers must select sites that will not simply perform well according to the current system state, but that will continue to be profitable for the facility's lifetime, even as environmental factors change, populations shift, and market trends evolve. Finding robust facility locations is thus a difficult task, demanding that decision makers account for uncertain future events (Owen and Daskin, 1998).

Facilities that are located are expected to operate for an extended time period. Moreover, changes of various natures during a facility lifetime may turn a good location today into a bad one in the future. Although typically no location decisions are made on the tactical or even operational level, a number of issues are strongly related to them, such as: inventory control policies; the choice of transportation modes and capacities; warehouse layout and management; and vehicle routing. However the globalization of economic activities together with fast developments in information technologies has led to shorter product

life cycles, smaller lot sizes and very dynamic customer behavior in terms of preferences. These aspects have contributed to growing demand uncertainty and as a result, a robust and well-designed supply chain network has become even more important (Melo, Nickel, et al., 2007).

Before locating a business in a particular location, there are a number of factors that one needs to consider in order to minimize the cost of serving customers and maximize its revenue. These factors may include: proximity to key suppliers; proximity to customers; nearness of the market and cost of serving customers; transport cost; land cost (rent); availability of labour skills; environmental stability; accessibility to power and electricity supply; government policies; nearby competition; and facility safety which also include work force safety (Ray, 1995). Location factors are a set of variables that one needs to consider when choosing the location of a business facility. It is critical therefore that manager of organization must consider facility location factors and how they affect performance of their supply chain.

The first selection decision process requires a clear understanding of the required strategy to be developed and communicated to all functions involved, Rahul (2005). After devising the strategy, the organization should develop location scenarios. Other factors come into play when analyzing the impact a new facility will have on a company's distribution network. These factors fall into two categories: quantitative and qualitative. Quantitative variables also referred to as cost drivers are tangible and relatively easy to define. The major ones are: demand centres and patterns, transportation costs and requirements, labour costs, facility costs and utility costs. The qualitative variables are more difficult to understand and to measure. They include customer service levels and top management preferences. A firm should be able to select the best site based on cost, operating factors and expected customer service levels. It is only when a good analysis of these factors is undertaken that a firm can ensure the greatest return on investment.

Researchers assert that many organizations or firms have to adopt strategic planning to cope with the turbulent environment. Ansoff (1984) suggests that for a firm to optimize its competitiveness and profitability, it has to match its strategy and supporting capability with the environment. These support capabilities include location of the firm and supply chain performance. In order to survive in the mobile telecommunications industry, firms must balance between location, supply chain performance and industry competition through exemplary strategic management. Aosa as reported by Mungumi (2013), states that strategic management helps organizations provide that long term direction whereby they view them in terms of their long term implications for probable success. Facility location therefore can be a bane or a boon to a business performance and managers are keen to ensure their businesses are strategically situated.

2.4 Supply Chain Performance

Supply chain encompasses all the activities associated with the flow and transformation of goods from the raw materials stage through to the end user, as well as the associated information flows. Monczka et al (2002), materials and information flow both up and down the supply chain. Supplier partnerships and strategic alliances refer to the cooperative and more exclusive relationships between organizations and their up-stream suppliers and downstream customers. Today many firms have taken bold steps to break down both inter and intra firm barriers to form alliances, with the objective of reducing uncertainty and enhancing control of supply and distribution channels. Such alliances are usually created to increase the financial and operational performance of each channel member through reductions in total cost and inventories and increased sharing of information (Maloni and Benton, 1997).

Supply chain performance is the entire chain's ability to meet end-customer needs through product availability and responsiveness on-time delivery. Supply chain performance involves both functional lines and company boundaries. Improving supply chain performance is a continuous process that requires both an analytical performance measurement system, and a mechanism to initiate steps for realizing key performance

indicators (KPIs) goals. The mechanism to achieve KPIs goals is referred as KPIs accomplishment; it connects planning, and execution, and builds steps for realization of performance goals into routine daily work (Coyle, Bardi and Langley, 2003).

To measure supply chain performance, there are a set of variables that capture the impact of actual working of supply chains on revenues and costs of the whole system. These variables as drivers of supply chain performance are always derived from supply chain management practices (Stewart, 1995). Managers of an organization have to achieve an improvement in their supply chains; this is achieved through continuous planning, and can be measured in the context of the following supply chain activities/processes: plan, source, make and assemble, and delivery/customer. These activities are considered at various levels of management - strategic, tactical and operational levels (Cai et al., 2008). According to the results of selected KPIs' accomplishment, managers may create current reports on KPIs, to compare multiple plans of supply chain management (Huan, Sheoran and Wang, 2004). In this performance management cycle, there are many challenges, both in performance measurement and in Supply Chain Performance improvement.

2.5 Facility Location and Supply Chain Performance of the Mobile Telecommunication Firms

Facility location highly contributes to Supply Chain Performance of an organization. When an organization is determining the location of a facility, it should be guided by location factors to make this decision (ReVelle et al 1977). For instance, a firm dealing with manufactured goods and services should be located close to the factory to cut transport costs and improve efficiency in delivery of manufactured goods and services. This helps in enhancing supply chain performance of the organization (Ghosh and Harche, 1993).

Study by Bhatnagar and Sohal (2005) confirmed that Supply Chain Performance is impacted by several factors beginning with the plant location decision. Existing literature has tended to predominantly emphasize quantitative factors such as transport costs, exchange rates, labour rates and taxes. Their results largely support the assertion that there is a significant relationship between qualitative plant location factors such as labour, infrastructure, business environment, political stability, proximity to markets, proximity to suppliers, key competitors' location, supply chain uncertainty and broad firms' practices and the operational competitiveness of supply chains as measured by quality, flexibility, inventory turnover and responsiveness. Ray, (1995), affirmed that factors to consider when deciding to locate a business in a particular area are; proximity to customers, proximity to suppliers, infrastructure, quality of labour, operational cost (cost of labour, wage rates and utility cost), and government regulations and policies.

Proximity to customers; a firm has to consider the proximity of its customers that it intends to maintain and sustain proper supply chain systems. It must consider its customers before making a decision to set up an organization in any location. Firms that are closer to their customers are likely to get more customers than organizations that are located away from their customers (Handler and Mirchandani, 1990).

Proximity to suppliers; a firm should make a choice on their supply chain partners. The suppliers of goods and services should be reliable to ensure that goods and services are delivered on time. A reliable supplier should win the confidence and trust to its customers (Handler and Mirchandani, 1991). A supplier who is able to supply goods and services on time always easily wins the confidence of its customer. A good supplier relationship management is essential in achieving supply chain performance between the supply chain partners. The organization can have an arrangement with the supplier to offer goods and services at an agreed time to enhance customer satisfaction (Hogan and ReVelle, 1997).

Infrastructure is a key factor to consider when making a location decision. Infrastructure in this case involves the road network (railways, airports, and sea-ports), technology, buildings and so forth. High quality infrastructure facilitates access not only to output markets, but also to the suppliers of intermediate and primary outputs, thereby lowering costs. A firm should ensure that it is located in a place with good infrastructural facilities to enable easy access and convenience to both customers and suppliers and other stakeholders, for example, the government. Infrastructure is an essential component towards achieving supply chain performance since it plays a fundamental role in ensuring improved speed of transportation and delivery of goods and services to customers. This helps in improving the quality of goods and services delivered in a cost effective manner (Drezner, 1995).

Quality of Labour is a critical component of the firm's Supply Chain Performance. A firm that easily accesses quality labour is able to cut its operational costs leading to supply chain performance. Each and every organization requires both skilled and unskilled labourers to carry out all its activities smoothly. An organization that is closely located to its labourers is able to access cheap labour due to reduced transport costs (Hogan and ReVelle, 1990). On the other hand, a firm that is located far away from its labourers incurs high labour costs since they will have to travel for long distances to the location where the organization is situated (Daskin and Jones, 1993). The quality of labour is important for quality services to the organization. When making a location

decision the organization should consider being located in a place with access to professionals and technical staff who can deliver quality services to the organization so as to improve its efficiency and effectiveness in service delivery.

Operational Costs are among the factors. When making location decisions, the firms should consider a number of costs that arise, they can be classified into fixed and variable costs. Fixed cost includes installation and start-up cost, along with investment. Variable cost includes transportation, operations, production, services, distribution, logistics, waste disposal, maintenance, and environmental cost. Transportation cost is the highest and installation cost the second highest. Several problems have used a 'total cost' criterion which contains all cost under one objective (Farahani et al., 2010). The goal of the Mobile Telecommunication firm in developing its Supply Chain strategy should be to provide customer service while reducing costs thereby increasing its profits and being competitive. In order to mitigate these costs they should be centrally located to enable easy access of skilled labourers, to access supply chain partners and other services providers (Badri, 1996). This helps the firm to carry out its activities smoothly leading to improving supply chain performance. Similarly, these costs may involve for example tailoring existing buildings to fit in the operations or building an operation from scratch.

Government policies and regulations determine the location of a facility. Firm should consider the stipulated rules and regulations. The activities and function of the firms should be in harmony with the local environment regulations which might limit business operations (Barkley and McNamara, 1994). The management of Mobile Telecommunication firms should be aware of the government regulations before deciding to locate the business in a particular area. The location decisions can be costly when a service organisation locates its business in a government restricted zone for instance an area where the opening and closing hours are controlled. On the other hand, in unrestricted environments the firms can benefit from government tax incentives that enhance corporate development and thus improving supply chain performance (Atthirawong, and MacCarthy, 2000).

For example Safaricom and Airtel Kenya are centrally located in major town to increase accessibility to their services providers, suppliers and other stakeholders (Schilling, Jayaraman and Barkhi, 1993). This improves supply chain relationships with other supply chain partners like suppliers and services providers. The centrality of their positions in major towns targets a large pool of customers operating within those towns for example corporate both private and public sector seeking telecommunication services from among the major firms. This also helps in cutting transport costs making it convenient for customers. Both Airtel and Safaricom have heavily invested in modern technologies for ICT to increase the strength of reception to serve customers in the rural areas. They have retail shops across the country to increase accessibility to all customers, in addition the cost of their products are harmonized to make them affordable to all classes of the people in the market.

2.6 Summary and Conceptual Framework

The information obtained from literature review was therefore an illustration of the amount of information available on facilities location, facility location factors and supply chain performance. This section summarizes the lessons learned and highlights the gap to be addressed by this study. The Conceptual Framework will guide the operationalization of independent and dependent variables in the study.

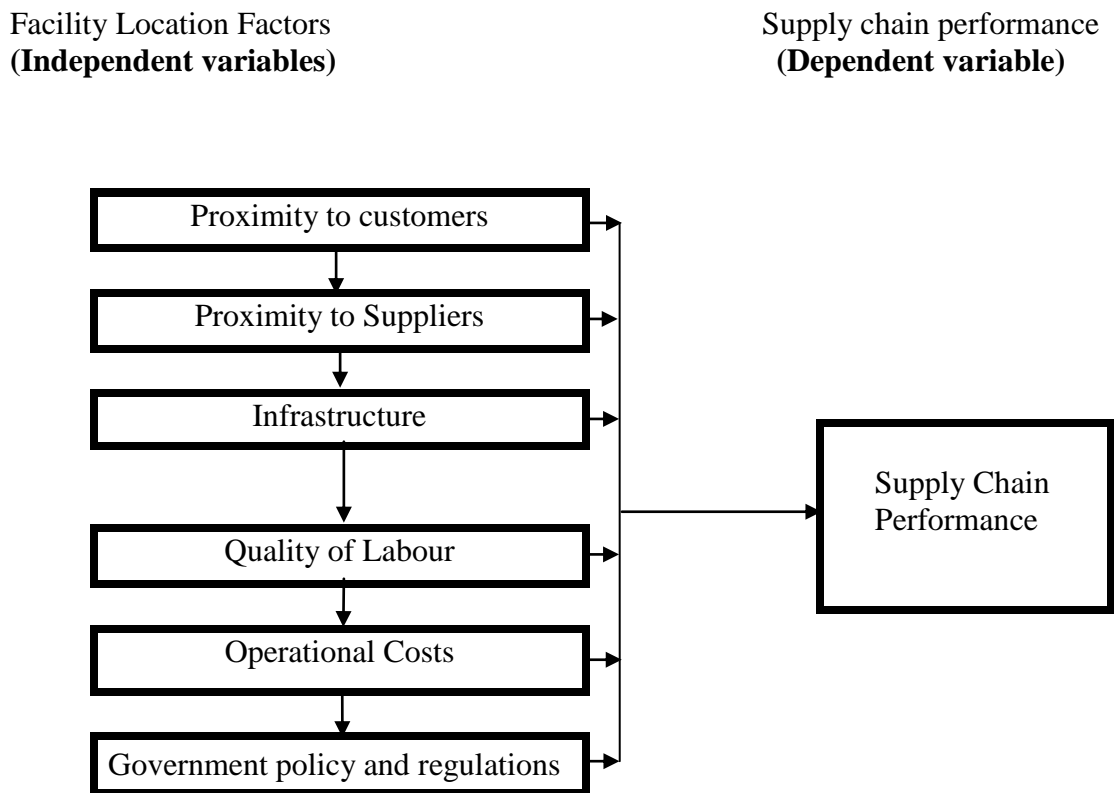
Literature review was carried out covering a number of subtopics in this research, from theories supporting facility location factors and supply chain performance, and theoretical framework in the mobile telecommunication firms. Through literature, it is clear that no single business entity can stand on its own in an industry without exercising some level of cooperation with other players and this is equally true in mobile firms in Kenya. Government too, through the regulation authority, has greater say on how the industry is run. In Kenya, the CAK is responsible for not only issuing permits but also providing a level playing field for all the players in the industry. From the empirical studies locally and internationally, it is quite evident that none of the studies focuses on the facility

location and supply chain performance in the mobile telecommunication firms in Kenya, there is need to address this knowledge gap.

The conceptual framework in this study shows the operationalization and relationship that exist between facility location factors (independents variables) and their influence on the activities of the supply chain performance (dependent variable) of mobile telecommunication operators.

Figure 2.1 indicates that facility location factors on the left used/adopted in various mix can influence or determine the choice of location of the facility and has the ability to enhance efficiency, agility, effectiveness and responsiveness of the firm.

Figure 2.1: Conceptual Framework



Source: Researcher, 2014

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter presented the methodology that was used in the study. It showed the research design, population of the study, data collection techniques and data analysis techniques. This section specified the framework or the blue print for the entire research process that enabled the researcher to achieve the objectives of the study.

3.2 Research Design

This study used the descriptive research design. Descriptive research design is most appropriate since the objective of the study was to establish the facilities location factors and supply chain performance of the Mobile Telecommunication Firms in Kenya. The descriptive research design has been used successfully by several past studies including Amimo (2013) who studied location decisions by food manufacturing firms in Kenya. Gonda (2012) also used a similar research design successfully in his study on warehouse location and design decisions among large scale manufacturing firms in Nairobi, Kenya.

3.3 Population of the Study

The target population in this study comprised of all mobile telecommunication firms in Kenya. According to Communication Authority of Kenya (2014) there were four (4) licensed mobile operators firms providing mobile telecommunication services throughout the country (Appendix II).

3.4 Sampling Design

For purposes of the study, a census was proposed given the small population size of the industry players. According to Cooper and Schindler (2003) a census is feasible when the population is small and necessary when the elements are quite different. Five (5) respondents were interviewed in each firm by use of convenient sampling technique and given the questionnaire to fill. Those five respondents were procurement manager;

operations manager; finance manager, sales managers and marketing manager because they were thought to have a say on facility location decision of the firm.

3.5 Data Collection

The study used both primary and secondary data. Primary data was collected using a questionnaire. The questionnaire was administered face to face on all the mobile telecommunication firms in the country. Primary data is data observed or collected directly from first-hand experience and in most cases data collected for the first time is usually collected by the researcher. The questionnaire had three sections. The first part contained questions on the bio data of the respondents; the second and third sections contained questions on the objectives of the study. Since this study was a census, all firms in the mobile telecommunication firms were interviewed and information collected via questionnaire.

Secondary data was used to validate the information arising from primary data. Usually this data is collected from literature, and website of the mobile operators in the telecommunication firms. The questionnaire was administered through face to face interviews and where the respondents were not able to give interviews, the drop and pick administration technique was employed.

3.6 Data Analysis

The data collected was analysed by both quantitative and qualitative method using analysis tools including means and standard deviations. Means were calculated on data collected on likert scale ranging from one to five on responses from the least favourable to the most favourable. The means were calculated from the average score on the likert scale by all respondents.

Correlation and regressions was used to determine the existence, if any, of the relationship between facility location factors and their influence on supply chain performance of the mobile telecommunication firm's thereby addressing objective two of the study. The regression equation was of the form below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon$$

Where:

Y = Dependent variable representing firm's Supply Chain performance;

β_0 = Standardized co-efficient at no facility location factor used;

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5,$ and β_6 = Regression weights attached to the variables or standardized coefficient when facility location factors one to six are used.

X_1, X_2, X_3, X_4, X_5 and X_6 = Independent variables representing facility location factors for this study they are: quality of labour, proximity to customers, proximity to supplier, operational cost, infrastructure, government policy and regulations respectively.

ε = error term

CHAPTER FOUR: DATA ANALYSIS AND FINDINGS

4.1 Introduction

This chapter presents the profile of respondents, facility location decisions, supply chain performance, facility location and supply chain performance and discussions of results. The survey questionnaire was administered to managers in charge of procurement, operations, finance, sales and marketing because they had a say on facility location decision of their respective companies: Safaricom, Bharti Airtel, Essar Telecom Kenya and Telkom Kenya as at September 2014. A summary of the response rates per Telecommunication Company is presented in Table 4.1.

Table 4.1 Distribution of Respondents per Telecommunication Company

| Company | Targeted Sample | Response | Response Rate (%) |
|---------------------|------------------------|-----------------|--------------------------|
| Safaricom | 5 | 5 | 100 |
| Bharti Airtel | 5 | 5 | 100 |
| Essar Telecom Kenya | 5 | 4 | 80 |
| Telkom Kenya | 5 | 5 | 100 |
| TOTAL | 20 | 19 | 95 |

Source: Research Data, 2014

4.2 Profile of Respondents

Data regarding the characteristics of the respondents regarding their length of service in the company including role in determining the location of a facility were collected.

4.2.1 Length of Service

A character sought from respondents was their length of service as this was key in capturing data on the factors considered in facilities location in these companies. Distribution of respondents in relation to this is presented in Table 4.2.

Out of the 20 questionnaires distributed in the four companies, 19 responded. This was a response rate of 95 percent. This was a high response rate that was enhanced using various ways. First an introductory letter that briefly explained the purpose of the study accompanied the questionnaire assuring anonymity of the responses provided. Secondly, the face to face method together with phone calls and emails proved effective.

Table 4.2: Distribution of Respondents by Length of Service in the Companies

| Length of service | Frequency | Percent |
|--------------------------|------------------|----------------|
| 1-5 years | 4 | 21.1 |
| 6-10 years | 2 | 10.5 |
| Above 10 years | 13 | 68.4 |
| Total | 19 | 100.0 |

Source: Research Data, 2014

The analysis on Table 4.2 shows the distribution of the respondents with regard to their length of service in their respective telecommunication companies. Those who have served for more than ten years constitute 68.4% of the total respondents. This indicates that since they have been with the four telecommunication companies for a longer time, they have experienced more scenarios of facility location processes and hence could give more reliable assessment.

4.2.2 Role in determining the location of a facility

Respondents were also asked to indicate their role in determining the location of a facility and the results are summarized in Table 4.3.

Table 4.3: Distribution of Respondents by role in determining facility Location

| Involvement in Location Decisions | Frequency | Percent |
|--|------------------|----------------|
| Yes | 7 | 37 |
| No | 12 | 63 |
| Total | 19 | 100.0 |

Source: Research Data, 2014

An analysis of the respondents' role in determining the location of a facility indicated that 37% had a role in determining the location of a facility while 63% had no role in determining the location of a facility. This indicates that in Kenyan Telecommunication Companies, most facility location decisions are undertaken at the corporate management level with no inputs from functional heads.

4.3 Facility Location Decisions

The first objective of this study was to establish the factors considered in facility location decisions of the Mobile Telecommunication Firms in Kenya. A five point Likert scale was used to measure the extent to which respondents agreed that proximity to customers, proximity to suppliers, infrastructure, quality of labour, operational cost and government policy and regulations influence facility location decisions of the Mobile Telecommunication Firms in Kenya.

The score of 'very great extent' and 'great extent' represented a factor influencing facility location decisions to a "Large Extent" (LE). This was equivalent to 1 to 2.4 on the continuous Likert scale ($1 \leq LE < 2.4$). The scores of 'medium extent' represented a factor

influencing facility location decisions to a “Moderate Extent” (ME). This was equivalent to 2.5 to 3.4 on the Likert scale ($2.5 \leq ME < 3.4$). The scores ‘small extent’ and ‘very small extent’ represented a factor influencing facility location decisions to a “Small Extent” (SE), equivalent to 3.5 to 5.0 on the Likert scale ($3.5 \leq SE < 5.0$). A summary of the descriptive statistics for analysis of the extent to which respondents agreed that the various factors influencing facility location decisions are as follows;

4.3.1 Proximity to Customers

A summary of the responses on the extent to which proximity to customers was a factor in facility location decision is presented in Table 4.4.

Table 4.4: Effect of Proximity to Customers on Facility location Decisions

| Statement | n | Mean | Std. Dev. |
|---|----|------|-----------|
| Ability to reach more customers | 19 | 1.8 | 0.9 |
| Need to better serve customers | 19 | 2.1 | 0.9 |
| To reduce customers lead time | 19 | 2.1 | 1.2 |
| To allow Customers easy access to the facility | 19 | 2.2 | 1.1 |
| Reduce customer's complaint to get your service | 19 | 3.6 | 1.3 |
| To improve competency in service delivery | 19 | 4.0 | 7.2 |
| To save time | 19 | 1.3 | 1.0 |
| <i>Composite Mean = 2.4, SD = 1.9</i> | | | |

Source: Research Data, 2014

Overall, with a composite mean score of 2.4 out of a possible 1, results presented in Table 4.4 indicate that proximity to customers influences facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent with mean scores equivalent to 1.0 to 2.4 on the Likert scale ($1 \leq LE < 2.4$). However, the extent to which proximity to

customers influences facility location decisions of mobile telecommunication firms in Kenya does differ significantly among the telecommunication firms in Kenya as reflected in the standard deviation of more than one (Std. Dev.>1.0). Moreover, it should be noted that ability to reach more customers, need to better serve customers, to reduce customers lead time and to allow customers easy access to the facility affect facility location decisions of mobile telecommunication firms in Kenya to a large extent with mean scores equivalent to 1.0 to 2.4 on the Likert scale ($1 \leq LE < 2.4$). Results in Table 4.4 indicate that reducing customer's complaint to get your service and improvement in competency in service delivery affect facility location decisions to a “Small Extent” (SE), equivalent to 3.5 to 5.0 on the Likert scale ($3.5 \leq SE < 5.0$).

4.3.2 Proximity to Suppliers

The extent to which proximity to suppliers affect facility location decisions of mobile telecommunication firms in Kenya is shown in Table 4.5.

Table 4.5: Effect of Proximity to Suppliers on Facility location Decisions

| Statement | n | Mean | Std. Dev. |
|--|----|------|-----------|
| To Reduce cycle time | 19 | 1.5 | 1.1 |
| Quick delivery of goods and services | 19 | 2.5 | 1.2 |
| Guarantee to get fast service from suppliers | 19 | 2.3 | 0.9 |
| To improve relationship with different suppliers | 19 | 2.0 | 0.9 |
| To improve information flow | 19 | 1.5 | 0.8 |
| <i>Composite Mean = 1.96, SD = 0.96</i> | | | |

Source: Research Data, 2014

As shown in Table 4.5, proximity to suppliers affect facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent with a composite mean score of 1.96 out of a possible 5 equivalent to 1.0 to 2.4 on the Likert scale ($1 \leq LE < 2.4$).

Moreover, the extent to which proximity to suppliers affect facility location decisions of Mobile Telecommunication Firms in Kenya does not differ significantly among the telecommunication firms as reflected in the standard deviation of less than one (Std. Dev. <1.0).

From the analysis, reduce cycle time; guarantee to get fast service from suppliers; to improve relationship with different suppliers; and to improve information flow affect facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent with mean scores equivalent to 1.0 to 2.4 on the Likert scale ($1 \leq LE < 2.4$). However, quick delivery of goods and services affects facility location decisions of Mobile Telecommunication Firms in Kenya to a moderate extent equivalent to 2.5 to 3.4 on the Likert scale ($2.5 \leq ME < 3.4$).

4.3.3 Infrastructure

This study further sought to establish the extent to which infrastructure affects facility location decisions of Mobile Telecommunication Firms in Kenya and Table 4.6 has a summary of the findings.

Table 4.6: Effect of Infrastructure on Facility location Decisions

| Statement | n | Mean | Std. Dev. |
|---|----|------|-----------|
| Existence of different transport modes | 19 | 2.5 | 1.4 |
| Availability of utilities (electricity/water) | 19 | 2.1 | 1.2 |
| Reliability and quality of infrastructure | 19 | 1.6 | 0.9 |
| Nearness to other facilities (Shopping Centres, Mall) | 19 | 2.2 | 1.2 |
| Transport from office to customer service centres or Agent houses | 19 | 2.7 | 1.3 |
| Transport from CBD to the office/firm | 19 | 2.5 | 1.3 |
| Distance to the competitors location | 19 | 3.4 | 1.3 |
| Number of your customer service Centres, shops, office and masts | 19 | 2.3 | 1.2 |
| <i>Composite Mean = 2.4, SD = 1.2</i> | | | |

Source: Research Data, 2014

Results presented in Table 4.6 indicate that overall, infrastructure affects facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent with a composite mean score of 2.4 out of a possible 1 equivalent to 1.0 to 2.4 on the Likert scale ($1 \leq LE < 2.4$). However, the extent to which infrastructure affects facility location decisions of Mobile Telecommunication Firms in Kenya does differ significantly among the telecommunication firms in Kenya as reflected in the standard deviation of more than one (Std. Dev. > 1.0).

It is worth noting that number of your customer service centres; shops; office and masts; availability of utilities (electricity/water); reliability and quality of infrastructure; and nearness to other facilities (shopping centres, mall) affects facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent with mean scores equivalent to 1.0 to 2.4 on the Likert scale ($1 \leq LE < 2.4$). However, results indicate that the existence of different transport modes; transport from office to customer service centres or agent houses; transport from CBD to the office/firm; and distance to the competitors location affect facility location decisions of Mobile Telecommunication Firms in Kenya to a moderate extent equivalent to 2.5 to 3.4 on the Likert scale ($2.5 \leq ME < 3.4$).

4.3.4 Quality of Labour

This study sought to establish the extent to which quality of labour affects facility location decisions of Mobile Telecommunication Firms in Kenya and Table 4.7 has a summary of the findings.

From the analysis in Table 4.7, quality of labour affects facility location decisions of mobile telecommunication firms in Kenya to a moderate extent equivalent to 2.5 to 3.4 on the Likert scale ($2.5 \leq ME < 3.4$). However, the extent to which quality of labour affects facility location decisions of mobile telecommunication firms in Kenya does differ significantly among the telecommunication firms in Kenya as reflected in the standard deviation of more than one (Std. Dev. > 1.0).

Table 4.7: Effect of Quality of Labour on Facility location Decisions

| Statement | n | Mean | Std. Dev. |
|--|----------|-------------|------------------|
| Education, skills of workers | 19 | 2.3 | 1.2 |
| Quality of work force | 19 | 3.5 | 1.4 |
| Ability to hire technical professionals | 19 | 2.2 | 1.3 |
| Ability to hire management staff | 19 | 2.3 | 1.1 |
| Employees flexibility | 19 | 2.0 | 0.7 |
| Union worker rules | 19 | 2.6 | 1.1 |
| Ability to secure employees' health and safety | 19 | 2.5 | 1.2 |
| <i>Composite Mean = 2.5, SD = 1.1</i> | | | |

Source: Research Data, 2014

From the findings, education and skills of workers; ability to hire management staff; employees flexibility; and ability to hire technical professionals affect facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent with mean scores equivalent to 1.0 to 2.4 on the Likert scale ($1 \leq LE < 2.4$). Results indicate that quality of work force affect facility location decisions to a “Small Extent” (SE), equivalent to 3.5 to 5.0 on the Likert scale ($3.5 \leq SE < 5.0$) while union worker rules and ability to secure employees' health and safety affect facility location decisions of Mobile Telecommunication Firms in Kenya to a moderate extent equivalent to 2.5 to 3.4 on the Likert scale ($2.5 \leq ME < 3.4$).

4.3.5 Operational Cost

This study sought to establish the extent to which operational costs affects facility location decisions of Mobile Telecommunication Firms in Kenya as shown in Table 4.8

Table 4.8: Effect of Operational Costs on Facility location Decisions

| Statement | n | Mean | Std. Dev. |
|--|----|------|-----------|
| Cost of land | 19 | 1.4 | 0.7 |
| Leasing/Rent costs | 19 | 2.6 | 1.2 |
| Change in annual running costs | 19 | 2.2 | 1.1 |
| Construction cost | 19 | 2.4 | 1.2 |
| Reduce transport costs | 19 | 2.7 | 1.0 |
| Storage and handling costs | 19 | 2.8 | 1.2 |
| Installation/maintenance cost | 19 | 2.7 | 1.1 |
| Costs of labour and wages rates | 19 | 2.8 | 1.3 |
| Utility cost (electricity, water, suppliers) | 19 | 2.2 | 1.1 |
| Cost to obtain permits to build and operate a facility | 19 | 2.6 | 1.1 |
| <i>Composite Mean = 2.4, SD = 1.1</i> | | | |

Source: Research Data, 2014

The results indicate that overall, operational costs affects facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent with a composite mean score of 2.4 out of a possible 1 equivalent to 1.0 to 2.4 on the Likert scale ($1 \leq LE < 2.4$). However, the extent to which operational costs affects facility location decisions of Mobile Telecommunication Firms in Kenya does differ significantly among the telecommunication firms in Kenya as reflected in the standard deviation of more than one (Std. Dev. > 1.0).

From the analysis, cost of land; change in annual running costs; construction cost and utility cost (electricity, water, suppliers) affect facility location decisions of mobile telecommunication firms in Kenya to a large extent with mean scores equivalent to 1.0 to 2.4 on the Likert scale ($1 \leq LE < 2.4$). However, results indicate that leasing/rent costs, reduce transport costs, storage and handling costs, installation/maintenance cost, costs of labour and wages rates and cost to obtain permits to build and operate a facility affect facility location decisions of mobile telecommunication firms in Kenya to a moderate extent equivalent to 2.5 to 3.4 on the Likert scale ($2.5 \leq ME < 3.4$).

4.3.6 Government Policy and Regulations

Respondents were also asked to indicate the extent to which government policy and regulations affects facility location decisions of mobile telecommunication firms in Kenya and Table 4.9 presents the findings.

Table 4.9: Effect of Government policy and Regulations on Facility location

Decisions

| Statement | n | Mean | Std. Dev. |
|---|----|------|-----------|
| Stable political and social environment | 19 | 1.8 | 0.9 |
| Market entry rules | 19 | 2.5 | 1.4 |
| Zoning (sector) regulation | 19 | 2.6 | 1.0 |
| National and local taxes | 19 | 2.2 | 0.8 |
| Opening and closing hours regulations | 19 | 2.6 | 1.1 |
| Trading agreement | 19 | 1.9 | 1.1 |
| Labour relations and unionization | 19 | 2.5 | 1.2 |
| <i>Composite Mean = 2.3, SD = 1.07</i> | | | |

Source: Research Data, 2014

The results indicate that government policy and regulations affects facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent with a composite mean score of 2.3 out of a possible 1 equivalent to 1.0 to 2.4 on the Likert scale ($1 \leq LE < 2.4$). However, the extent to which government policy and regulation affect facility location decisions of Mobile Telecommunication Firms in Kenya does differ significantly among the telecommunication firms in Kenya as reflected in the standard deviation of more than one (Std. Dev. > 1.0).

From the analysis, stable political environment; national and local taxes; and trading agreements affect facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent with mean scores equivalent to 1.0 to 2.4 on the Likert scale ($1 \leq LE < 2.4$). However, market entry rules; zoning (sector) regulation; opening and closing hours regulation; and labour relations and unionization affect facility location decisions of Mobile Telecommunication Firms in Kenya to a moderate extent equivalent to 2.5 to 3.4 on the Likert scale ($2.5 \leq ME < 3.4$).

4.3.7 Other Factors affecting facility location decisions

Respondents were also asked to indicate the extent to which other factors such as management preferences, quality of life, room for expansion, community environment and public reaction to the location among other affect facility location decisions of Mobile Telecommunication Firms in Kenya and Table 4.10 presents the findings.

Table 4.10: Other Factors affecting facility location decisions

| Statement | n | Mean | Std. Dev. |
|---|----------|-------------|------------------|
| Management preferences | 19 | 1.9 | 1.1 |
| Quality of life | 19 | 2.5 | 1.2 |
| Room for expansion | 19 | 2.7 | 1.2 |
| Community environment | 19 | 2.6 | 1.1 |
| Public reaction to the location | 19 | 1.7 | 1.1 |
| The prices charged on the product in the area as compared to other location | 19 | 1.4 | 0.7 |
| Security from and to the facility | 19 | 2.6 | 1.1 |
| Nearby competitor | 19 | 2.1 | 1.1 |
| Highly industrial concentration | 19 | 2.1 | 0.9 |
| Ability to redesign the facility (warehouse/customer care) | 19 | 2.5 | 1.2 |
| <i>Composite Mean = 2.2, SD = 1.07</i> | | | |

Source: Research Data, 2014

The results indicate that overall, other factors affect facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent with a composite mean score of 2.4 out of a possible 1 equivalent to 1.0 to 2.4 on the Likert scale ($1 \leq LE < 2.4$). Further the results indicate that management preferences, public reaction to the location, nearby competitor, highly industrial concentration and the prices charged on the product in the area as compared to other location affect facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent with mean scores equivalent to 1.0 to 2.4 on the Likert scale ($1 \leq LE < 2.4$). However, quality of life; room for expansion; community environment; security from and to the facility; and ability to redesign the facility (warehouse/customer care) affect facility location decisions of mobile

telecommunication firms in Kenya to a moderate extent equivalent to 2.5 to 3.4 on the Likert scale ($2.5 \leq ME < 3.4$).

4.4 Facility Location and Supply Chain Performance

This section presents the correlation and regression analysis of various variables in the study.

4.4.1 Correlation between Facility Location Factors and Supply Chain Performance

The Pearson's Product moment correlation, which is a non-parametric measure of the strength and direction of association that exists between two variables was used. Although the 0.05 level of significance is considered better because it is neither too high nor too low, Kerlinger (1986) observed that reporting the significance of all levels is acceptable by scholars. Following this assertion, results of each significance level (0.05 and 0.01) are reported. The Pearson's Product moment correlation analysis for the relationship between facility location decisions factors and supply chain performance of mobile telecommunication firms in Kenya are presented in Table 4.11.

Table 4.11: Correlation of Facility Location Factors and Supply Chain Performance

| | | Proximity to Suppliers | Infrastructure | Quality of Labour | Operational Costs | Government Policy and Regulations | Supply Chain Performance |
|---|------------------------|------------------------------|----------------|-------------------------|----------------------|---|-----------------------------|
| Proximity to Customers | Pearson Correlation | .375 | .595(**) | .694(**) | .559(*) | .622(**) | .586(**) |
| | Sig. (2-tailed) | .114 | .007 | .001 | .013 | .004 | .008 |
| Proximity to Suppliers | Pearson Correlation | | .380 | .234 | .460(*) | .084 | .314 |
| | Sig. (2-tailed) | | .108 | .334 | .047 | .731 | .190 |
| Infrastructure | Pearson Correlation | | | .641(**) | .845(**) | .503(*) | .547(*) |
| | Sig. (2-tailed) | | | .003 | .000 | .028 | .015 |
| Quality of Labour | Pearson Correlation | | | | .625(**) | .640(**) | .423 |
| | Sig. (2-tailed) | | | | .004 | .003 | .071 |
| Operational Costs | Pearson Correlation | | | | | .608(**) | .406 |
| | Sig. (2-tailed) | | | | | .006 | .084 |
| Government Policy and Regulations | Pearson Correlation | | | | | | .469(*) |
| | Sig. (2-tailed) | | | | | | .043 |

Source: Research Data, 2014

The Pearson's Product moment correlation results described in Table 4.11 show that proximity to customers showed strong and significant positive relationship with supply chain performance, showing a correlation coefficient of $r = 0.586$, $P < .01$. The results also show that strong and significant positive relationships are observed between infrastructure and supply chain performance ($r = 0.547$, $P < .01$). The results show that a moderate and positive relationship was observed between government policy and regulations ($r = 0.469$, $p < .01$), quality of labour ($r = 0.423$, $p < .01$), operational costs ($r = 0.406$, $P < .01$) and proximity to suppliers ($r = 0.314$, $P < .01$) and supply chain

performance. Proximity to customers therefore has the highest effect on supply chain performance, followed by infrastructure, then government policy and regulations, quality of labour and operational costs while proximity to suppliers has the lowest effect on supply chain performance in mobile telecommunication firms in Kenya.

4.4.2 Regression Model of Facility Location on Supply Chain Performance

In this section, the results of regression analysis between variables are presented and interpreted. The linear regression model was used to predict the influence Facility Location Factors on Supply Chain Performance.

Table 4.12: Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .697 ^a | .486 | .229 | .53446 |

Source: Research data, 2014

As shown in Table 4.12, proximity to customers; proximity to suppliers; infrastructure; quality of labour; operational costs and government policy and regulations accounted for 48.6% of variance in Supply Chain Performance of Mobile Telecommunication Firms in Kenya ($R^2 = 0.486$). This means that the six facility location decisions factors studied can only explain 48.6% of changes in the Supply Chain Performance in Mobile Telecommunication Firms in Kenya.

With a $R^2 = 0.45$, we can infer that the variation left unexplained by the model was not caused by a large rating error but rather by the exclusion of predictors from the model that affect the level of Supply Chain Performance. This suggests that this model may be missing some important variables that employees agree affect the level of Supply Chain Performance. Despite this limitation of the variables available on the Facility Location decisions factors for inclusion in the model, the high levels of correlation justify the

generation of a single linear model to predict the employee opinion about the level of supply chain performance. To test the overall significance of the model, the ANOVA model was generated using SPSS version 11.5 and the results are in Table 4.13.

Table 4.13: ANOVA

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|----|-------------|-------|-------------------|
| 1 | Regression | 2.244 | 6 | 0.541 | 1.893 | .163 ^a |
| | Residual | 3.428 | 12 | 0.286 | | |
| | Total | 6.671 | 18 | | | |

Source: Research data, 2014

As shown in Table 4.13, given that the regression mean ($m = 0.541$) is significantly greater than the residual variability ($m = 0.286$), it is concluded that the research samples differed on the outcome variable. This is supported by the ratio $F (1.893)$, which serves as a measure of the statistical importance or significance of the differences among the group means. Given that the value of $F (1.893)$ is much larger than 1, this indicates that some of the groups differed significantly in terms of their mean or average values. This could be attributed to varying perceptions of Supply Chain Performance in relation to facility location decisions factors by staff in the various Mobile Telecommunication Firms in Kenya. The significance of this model seemed that the significance level of 0.168 was above the 10% significance level. This can be explained by the fact that the analysis may be missing some important variables that employees agree affect the level of Supply Chain Performance. The category of other factors was not taken into consideration and may explain why the significance level was higher than 10%. A summary of the coefficients of regression equation is resented in Table 4.14.

Table 4.14: Regression Coefficients

| Model | Unstandardized | | Standardized | T | Sig. |
|--|----------------|------------|--------------|--------|-------|
| | Coefficients | | Coefficients | | |
| | B | Std. Error | Beta | | |
| (Constant) | 0.922 | 0.876 | | 1.053 | 0.313 |
| Proximity to Customers (X ₁) | 0.636 | 0.404 | 0.662 | 1.576 | 0.141 |
| Infrastructure (X ₂) | 0.307 | 0.286 | 0.353 | 1.072 | 0.305 |
| Government Policy (X ₃) | 0.186 | 0.208 | 0.299 | 0.893 | 0.389 |
| Quality of Labour (X ₄) | 0.206 | 0.265 | 0.202 | 0.777 | 0.452 |
| Proximity to Suppliers (X ₅) | 0.191 | 0.431 | 0.147 | 0.443 | 0.665 |
| Operational Costs (X ₆) | -0.701 | 0.606 | -0.536 | -1.158 | 0.270 |

Source: Research data, 2014

Substituting the beta coefficients from Table 4.13 generates the predictor equation

$$Y = 0.922 + 0.662X_1 + 0.353X_2 + 0.299X_3 + 0.202X_4 + 0.147X_5 - 0.536X_6$$

The equation was used to infer what a unit change in each of the independent variable would have on the dependent variable. Holding all independent variables constant at zero, the dependent variable would have a score of 0.922. A unit increase proximity to customers variable, holding all the other variable constant will lead to a 0.662 increase in supply chain performance of mobile telecommunication firms in Kenya; a unit increase in infrastructure will lead to a 0.353 increase in supply chain performance of mobile telecommunication firms in Kenya; a unit increase in government policy and regulations will lead to a 0.299 increase in Supply Chain Performance of Mobile Telecommunication Firms in Kenya; a unit increase in quality of labour will lead to a 0.202 increase in Supply Chain Performance of Mobile Telecommunication Firms in Kenya; a unit increase proximity to suppliers will lead to a 0.147 increase in Supply Chain Performance of Mobile Telecommunication Firms in Kenya; while a unit increase in operational costs will lead to a 0.536 increase in Supply Chain Performance of Mobile Telecommunication Firms in Kenya. This implies that proximity to customers was the most significant factor influencing Supply Chain Performance of Mobile Telecommunication Firms in Kenya.

4.5 Discussion of Results

Results presented indicate that proximity to customers influences facility location decisions of mobile telecommunication firms in Kenya to a large extent with mean scores equivalent to 1.0 to 2.4 on the Likert scale ($1 \leq LE < 2.4$). As noted in this study's literature review, a firm has to consider the proximity of its customers that it intends to maintain and sustain proper supply chain systems. Findings that proximity to customers influences facility location decisions of mobile telecommunication firms in Kenya to a large extent are consistent with observation by Handler and Mirchandani, 1990.

Findings indicate that proximity to suppliers affect facility location decisions of mobile telecommunication firms in Kenya to a large extent. From the literature review, a supplier who is able to supply goods and services on time always easily wins the confidence of its customers. These findings that proximity to suppliers influences Facility Location decisions of Mobile Telecommunication Firms in Kenya to a large extent are consistent with Hogan and ReVelle, 1997.

Analysis of findings indicate that overall, infrastructure affects facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent with a composite mean score of 2.4 out of a possible 1 equivalent to 1.0 to 2.4 on the Likert scale ($1 \leq LE < 2.4$). It is worth noting that number of your customer service centres; shops; office and masts; availability of utilities (electricity/water) and reliability and quality of infrastructure; nearness to other facilities (shopping centres, mall) affects facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent with mean scores equivalent to 1.0 to 2.4 on the Likert scale ($1 \leq LE < 2.4$). However, results indicate that the existence of different transport modes; transport from office to customer service centres or agent houses, transport from CBD to the office/firm and distance to the competitors location affect facility location decisions of Mobile Telecommunication Firms in Kenya to a moderate extent equivalent to 2.5 to 3.4 on the Likert scale ($2.5 \leq ME < 3.4$). Findings that infrastructure affects facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent are consistent with assertions by Drezner (1995), giving the firm

easy access and convenience to both customers and suppliers and other stakeholders, for example, the government.

It was established that quality of labour affects facility location decisions of Mobile Telecommunication Firms in Kenya to a moderate extent. From the findings, ability to hire technical professionals; ability to hire management staff; employees' flexibility; education and skills of workers affects facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent. Despite the fact that quality of labour affects facility location decisions of Mobile Telecommunication firms in Kenya to a moderate extent, these findings lend support to the proposition by Daskin and Jones (1993).

In relation to operational costs, to save time and costs, to reduce cycle time, availability of utilities (electricity/water), cost of land, utility cost and change in annual running costs affect facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent. However, results indicate that reduced transport utilities costs; cost to obtain permits to build and operate a facility; costs of labour and wages rates; transport from office to customer service centers or agents houses, storage and handling costs; transport from CBD to the office/firm and installation/maintenance cost affect facility location decisions of mobile telecommunication firms in Kenya to a moderate extent. Overall, the results indicate that operational costs affects facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent is consistent with assertions by Badri (1996).

Findings showed that government policy and regulations affects facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent. From the reviewed literature, government policies and regulations determine the location of a facility. These study findings that government policy and legislation affects facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent are consistent with the empirical assertions by Barkley and McNamara, 1994.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The objectives of the study were to establish the factors considered in Facility Location decisions of the Mobile Telecommunication Firms in Kenya and to determine the relationship between Facility Location Factors and the Supply Chain Performance of the Mobile Telecommunication Firms in Kenya. This chapter summarizes the findings by making conclusions and recommendations based on the two specific objectives of the study; it also shows the limitations of the study and suggests areas for further research. The collected data was analyzed and interpreted in line with the objectives of the study and analyzed through descriptive statistics.

5.2 Conclusions

The first specific objective of this study was to establish the factors considered in facility location decisions of the Mobile Telecommunication Firms in Kenya. Analysis of findings indicate that overall, infrastructure affects facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent. It was established that quality of labour affects facility location decisions of Mobile Telecommunication Firms in Kenya to a moderate extent. Results presented indicate that proximity to customers influences facility location decisions of mobile telecommunication firms in Kenya to a large extent. Findings indicate that proximity to suppliers affect facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent.

In relation to operational costs, that may include operations to save time and costs; to reduce cycle time; availability of utilities (electricity/water); cost of land; utility cost and change in annual running costs affect facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent. However, results indicated that reduced transport utilities costs; cost to obtain permits to build and operate a facility; costs of labour and wage rates; transport from office to customer service centers or agents; storage and handling costs; transport from CBD to the office/firm and

installation/maintenance cost affect facility location decisions of Mobile Telecommunication Firms in Kenya to a moderate extent. Overall, results indicate that operational costs affects facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent; government policy and regulation affects facility location decisions of Mobile Telecommunication Firms in Kenya to a large extent.

In addressing the second objective this study established that there was a positive relationship between Facility Location Factors and the Supply Chain Performance of the Mobile Telecommunication Firms in Kenya. The Pearson's Product correlation results showed that proximity to customers showed strong and significant positive relationship with supply chain performance, showing a correlation coefficient of $r = 0.586$, $P < .01$. The results show that strong and significant positive relationships are observed between infrastructure and supply chain performance.

The results show that a moderate and positive relationship was observed between government policy and regulations, quality of labour, operational costs and proximity to suppliers and supply chain performance. Proximity to customers therefore had the highest effect on supply chain performance, followed by infrastructure, then government policy and regulations, quality of labour and operational costs while proximity to suppliers has the lowest effect on Supply Chain Performance of the Mobile Telecommunication Firms in Kenya

5.3 Recommendations

Mobile Telecommunications firms in Kenya need to involve their staff especially at functional units in determining locations of their facilities. Kenya is endowed with highly skilled workforce with technical ability ready to hire technical professionals, to hire as management staff; the employees' have flexibility and good education, and skills that can help in decisions of facility location in the Mobile Telecommunication Firms.

Proximity to customers had the highest effect on Supply Chain Performance, followed by infrastructure, then government policy and regulations, quality of labour and operational costs while proximity to suppliers has the lowest effect on Supply Chain Performance in Mobile Telecommunication Firms in Kenya. This study recommends that facilities should be located close to factors that affect supply chain performance like, customers, suppliers and general infrastructure in order to facilitate better performance of the supply chain which is critical in the overall performance of the firm.

This study recommends that Mobile Telecommunication Firms critically need to evaluate their decision making and start involving the talented and highly skilled workforce in Kenya to come up with facility location decisions. This practice could have revolutionary effect on the firms by realizing the potential in the personnel and their knowledge of the local work environment and conditions including suggesting ways of the firms staying ahead of competition. Mobile telecommunication firms can use these study findings and find ways of better engaging the government in negotiating for a better work environment.

The report affirms the critical role of the game theory and that it is possible in Mobile Telecommunication industry that firms take advantage of their strength and out-compete other firms while they can use their weaknesses to cooperate with other firms in the industry. Mobile Telecommunication firms from the results cannot ignore the fact that facility location factors and decisions have a profound effect on the performance of the firms supply chain. This fact has been realized and the regulatory authority in the industry CAK has deliberately forced firms to encourage cooperation in the areas of infrastructure layout where one firm can use another's mast instead of putting up several masts across the country. This is not only a cost saving approach but also conserves the environment hence firms going green.

This study report will be useful among the academicians as previously there was no such study in sub Saharan African. The government of Kenya through the industry regulator

CAK will need to develop policy and regulations framework to encourage investment in the Mobile Telecommunication Industry. Currently only four firms are registered while the industry has information that one of the firms may fold business. A good policy framework may focus on lower operational costs by firms, open one stop shops in registering and licensing and help firms in the acquisition of land for setting up office and also consider lower taxes to encourage the investors pass the benefits to the local population in the country.

5.4 Limitations of the Study

The study was limited were the feeling by Mobile Telecommunication Firms that the information required by the study was confidential and some respondents were not comfortable filling it. Given that the respondents are busy professionals, it was very hard to convince them to fill the questionnaires and some actually refused to take part in the study, this caused some delays in getting the questionnaires back from them. Scarcity of funds was another limitation. The limitations therefore dictated the duration of the study and the number of respondents.

5.5 Suggestions for further Research

This study was only able to address Facility Location and Supply Chain Performance of the Mobile Telecommunication Firms in Kenya. Further research should look into other factors that affect Facility Location of The Mobile Telecommunication Firms in Kenya. It will be necessary to carry out a study featuring other areas outside Kenya in order to find out if there are any similarities and differences in the findings of this study. A comparative study with another country both in the developed and developing country is needed in order to ascertain the similarities and differences in Facility Location and Supply Chain Performance of the Mobile Telecommunication Firms.

This study recommends that future researchers should study the extent that each Facility Location Factors influence decision making across a number of Industries not only in Kenya but also across the world so as to compare findings. These findings finally

suggested that a similar study establishing the suitability of the environment in which Mobile Telecommunication Firms operate in due to the current legal and regulatory framework and recommend better policy regime in order to encourage investment in the Mobile Telecommunication Industry in the country.

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APPENDICES

Appendix I: Introduction Letter



UNIVERSITY OF NAIROBI
SCHOOL OF BUSINESS
MBA PROGRAMME

Telephone: 020-2059162
Telegrams: "Varsity", Nairobi
Telex: 22095 Varsity

P.O. Box 30197
Nairobi, Kenya

DATE..15..09..2014

TO WHOM IT MAY CONCERN

The bearer of this letter ... KABENA NGANDU JESSIE

Registration No. 061175376/2012

is a bona fide continuing student in the Master of Business Administration (MBA) degree program in this University.

He/she is required to submit as part of his/her coursework assessment a research project report on a management problem. We would like the students to do their projects on real problems affecting firms in Kenya. We would, therefore, appreciate your assistance to enable him/her collect data in your organization.

The results of the report will be used solely for academic purposes and a copy of the same will be availed to the interviewed organizations on request.

Thank you.



PATRICK NYABUTO
MBA ADMINISTRATOR
SCHOOL OF BUSINESS

Appendix II: Research questionnaire

This questionnaire is confidentially administered to Mobile Telecommunication Firm's employees for the purpose of getting primary data for writing a research report for partial fulfilment of Master of Business Administration, being pursued by the scholar at The University of Nairobi. The responses that you will provide will be treated with a high degree of confidentiality.

Please provide the answer as accurately as you can by using a tick or filling in.

SECTION A: General information

1. Years in operation

Less than 1 year []

1-5 years []

6-10 years []

Above 10 years []

2. What is your job title

3. Do you play a role in determining the location of a facility in your company?

Yes []

No []

If yes, please explain the specific role you play in facility location decision.....
.....

SECTION B: Facility Location Factors

By use of a tick, indicate the extent to which any of the following location factors influence your decision in locating your business in a particular cite in Kenya. Kindly tick where appropriate. Where: 1= Very great extent; 2= Great extent; 3= Medium extent; 4= Small extent; 5= Very small extent

| N ^{br} | Location factors | 1 | 2 | 3 | 4 | 5 |
|-----------------|--|---|---|---|---|---|
| 1 | Accessibility to customers | | | | | |
| 2 | Accessibility to suppliers | | | | | |
| 3 | Stable political and social environment | | | | | |
| 4 | Capacity to reach more customers | | | | | |
| 5 | Reliability and quality of infrastructure | | | | | |
| 6 | To save time and costs | | | | | |
| 7 | Need to better serve customers | | | | | |
| 8 | Ability to redesign the warehouse/customer care facility | | | | | |
| 9 | To Reduce cycle time | | | | | |
| 10 | Quick delivery of goods and services | | | | | |
| 11 | Reduce transport utilities costs | | | | | |
| 12 | Transport modes available | | | | | |
| 13 | Availability of utilities (electricity/water) | | | | | |
| 14 | Reduce customer's complaint to get your service | | | | | |
| 15 | Cost of land | | | | | |
| 16 | Construction/rent cost | | | | | |
| 17 | Utility cost | | | | | |
| 18 | Cost to obtain permits to build and operate a facility | | | | | |
| 19 | Distance to the competitors location | | | | | |
| 20 | Market entry rules | | | | | |

| | | | | | | |
|----|---|--|--|--|--|--|
| 21 | Trading agreement | | | | | |
| 22 | Management preferences | | | | | |
| 23 | To improve competency in service delivery | | | | | |
| 24 | Labour relations and unionization | | | | | |
| 25 | Costs of labour and wages rates | | | | | |
| 26 | Quality of work force | | | | | |
| 27 | Ability to hire technical professionals | | | | | |
| 28 | Ability to hire management staff | | | | | |
| 29 | Employees flexibility | | | | | |
| 30 | Union worker rules | | | | | |
| 31 | Quality of life | | | | | |
| 32 | Market entry rules | | | | | |
| 33 | Zoning (sector) regulation | | | | | |
| 34 | National and local taxes | | | | | |
| 35 | Easy access of the location | | | | | |
| 36 | Nearness to other facilities (Shopping centres, Mall) | | | | | |
| 37 | Number of your customer service centres, shops, office, masts in the area | | | | | |
| 38 | Quality of life | | | | | |
| 39 | Quality of workforce | | | | | |
| 40 | Education, skills of workers | | | | | |
| 41 | Leasing/Rent costs | | | | | |
| 42 | Transport from office to customer service centres or Agents houses | | | | | |
| 43 | Number of customers service centres, masts, shops in the area | | | | | |

| | | | | | | |
|----|--|--|--|--|--|--|
| 44 | Storage and handling costs | | | | | |
| 45 | Transport from CBD to the office/firm | | | | | |
| 46 | Installation/maintenance cost | | | | | |
| 47 | Change in annual running costs | | | | | |
| 48 | Room for expansion | | | | | |
| 49 | Guarantee to get fast service from suppliers | | | | | |
| 50 | Community environment | | | | | |
| 51 | Public reaction to the location | | | | | |
| 52 | Health and security of worker | | | | | |
| 53 | Security from and to the facility | | | | | |
| 54 | Nearby competitor | | | | | |

SECTION C: The relationship Between Facility Location Factors and Supply Chain Performance of the Mobile Telecommunication Firms.

By use of a tick, indicate the extent to which the following statements are related to performance of your supply chain activities. Where: 1= Very great extent; 2= Great extent; 3= Medium extent; 4= Small extent; 5= Very small extent

| N ^{br} | Supply Chain Performance indicators | 1 | 2 | 3 | 4 | 5 |
|-----------------|--|---|---|---|---|---|
| 1 | Flexibility and accuracy of orders delivered | | | | | |
| 2 | Supplier response on time | | | | | |
| 3 | Quality service to customer | | | | | |
| 4 | Information dissemination | | | | | |
| 5 | Quick response on customer complaints | | | | | |
| 6 | Environment friendly Packaging | | | | | |
| 7 | On time Supply Chain decisions | | | | | |
| 8 | Efficiency in the entire supply chain | | | | | |
| 9 | Decentralization in decision making | | | | | |
| 10 | Better supplier relationship management | | | | | |
| 11 | Quick responses in handling customers queries | | | | | |
| 12 | Organization ability to contact suppliers quickly | | | | | |
| 13 | Database of suppliers can easily be maintained | | | | | |
| 14 | Professionalism and ethics in service delivery | | | | | |
| 15 | Monitoring of stock movement/Inventory control | | | | | |
| 16 | Orders and deliveries are easily processed to avoid delays | | | | | |
| 17 | Information moves faster and this reduces lead time in the organization | | | | | |
| 18 | Fast communication and decision making in the entire chain | | | | | |
| 19 | Efficiency in delivery of goods and services to customers | | | | | |
| 20 | Improved quality of services offered to the customers/ Timeliness of deliveries | | | | | |
| 21 | In general the location of your business has improved the performance of the overall supply chain activities | | | | | |

Thank you for your participation.

Appendix III: List of Mobile Telecommunication Firms in Kenya

1. Safaricom (Vodafone),
2. Bharti Airtel (formerly Zain, Celtel),
3. Essar Telecom Kenya (YU, formerly Econet),
4. Telkom Kenya (Orange, France Telecom).

Source: Communication Authority of Kenya (2014)