

**QUALITY, SUPPLY CHAIN MANAGEMENT AND SERVICE DELIVERY
IN THE ELECTRICITY SUPPLY FIRMS IN KENYA**

JANE NYAMBURA MWANGI

**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT FOR
THE REQUIREMENTS OF THE AWARD OF THE DEGREE OF MASTER
IN BUSINESS ADMINISTRATION SCHOOL OF BUSINESS UNIVERSITY
OF NAIROBI**

2017

DECLARATION

This research project is my original work and has not been submitted for examination to any other University.

Signature..... Date.....

Jane Nyambura Mwangi

D61/80971/2015

This research project has been submitted with my authority as the university supervisor.

Signature..... Date.....

Dr. X N. Iraki

Lecturer, Department of Management Science

University of Nairobi

ACKNOWLEDGEMENT

I wish to express special appreciation and gratitude to my supervisor Dr. X. N. Iraki for his guidance and suggestions from project conceptualizing till the completion. I also wish to acknowledge the encouragement and cheering on I got from my children, Mwangi, Wambo and Stephanie their moral their support as I devoted a lot of time to my studies.

DEDICATION

This project work is dedicated to the memory of my special friend and mentor, Margaret Wangui Ndirangu.

TABLE OF CONTENTS

DECLARATION	ii
ACKNOWLEDGEMENT	ii
DEDICATION	ii
LIST OF TABLES	v
LIST OF FIGURES	vi
LIST OF ABBREVIATIONS AND ACRONYMS	vii
ABSTRACT	viii
CHAPTER ONE: INTRODUCTION	1
1.1 Background of the study	1
1.1.1 Quality Management	3
1.1.2 Supply Chain Management	4
1.1.3 Service Delivery	5
1.1.4 Electricity Supply Firms in Kenya	6
1.2 Research Problem.....	8
1.3 Objective of the Study.....	10
1.5 Value of the study	10
CHAPTER TWO: LITERATURE REVIEW	12
2.1 Introduction	12
2.2 Theoretical Review	12
2.2.1 Stakeholder Theory.....	12

2.2.2 Total Quality Management Theory	14
2.3 Empirical Review	15
2.3.1 Quality Management	15
2.3.2 Supply Chain Management	16
2.3.2 Service Delivery	17
2.4 Conceptual Framework	18
CHAPTER THREE: RESEARCH METHODOLOGY	20
3.1 Introduction	20
3.2 Research Design	20
3.3 Population of Study	21
3.4 Data Collection.....	21
3.5 Data Analysis	22
CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSION	23
4.1 Introduction	23
4.2. Response Rate	23
4.3 General Information	25
4.3.1 Management Level	25
4.3.2 Years of Business Operation	26
4.4 Quality Management	28
4.4.1 Quality Standards in Supply Chain	28
4.4.2 Types of Quality Standardization in Electricity Supply Firms.....	29
4.4.3 Training in Quality Management	30
4.4.4 Importance of Quality in Organizations	31
4.5 Supply Chain Management	33
4.5.1 Strategies Managing Supply Chain	33

4.5.2 Involvement in Supply Chain Management Decisions	35
4.5.3 Areas of Supply Chain Improvement	35
4.6 Service Delivery	37
4.6.1 Complaints on Service Delivery.....	37
4.6.2 Duration Taken to Respond to Complaints	38
4.6.3 Number of Complaints Raised per Month.....	38
4.7 The Effect of Quality and Supply Chain Management on Service Delivery	39
4.7.1 Goodness of Fit.....	39
4.8.2 Analysis of Variance (ANOVA)	40
4.8.3 Beta Coefficients	41
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS	43
5.1 Introduction	43
5.2 Summary of Major Findings	43
5.2.1 Quality Issues in Supply Chain	43
5.2.2 The Effect of Quality and Supply Chain on Service Delivery	45
5.3 Conclusion of the Study	46
5.3.1 Quality Issues in Supply Chain	46
5.3.2 The Effect of Quality and Supply Chain on Service Delivery	47
5.4 Recommendations of the Study	47
5.5 Suggestion for Further Study	48
REFERENCES.....	49
APPENDICES	52
Appendix I: Questionnaire	52
Appendix II: The Institutional Structure of the Energy Sub Sector	56

LIST OF TABLES

Table 4.1: Distribution of Response Rate	24
Table 4.2: Distribution of Respondents.....	24
Table 4.3: Years of Business Operation.....	27
Table 4.4: Duration of Employment	28
Table 4.5: Quality Standards in Supply Chain.....	29
Table 4.6: Types of Quality Standardization	29
Table 4.7: Quality Management Training	30
Table 4.8: Rating Importance of Quality in Organizations.....	31
Table 4.9: Strategies to Manage Supply Chain.....	33
Table 4.10: Decision Making in Supply Chain Management.....	35
Table 4.11: Rating Areas of Supply Chain Improvement.....	36
Table 4.12: Number of Hours Taken to Respond to Complaints.....	38
Table 4.13: Number of Complaints Rose per Month	39
Table 4.14: Model Summary.....	40
Table 4.16: Beta Coefficients.....	41

LIST OF FIGURES

Figure 2.1: Conceptual Model.....	18
Figure 4.1: Management Level	26

LIST OF ABBREVIATIONS AND ACRONYMS

BE	:	Business Excellence
ERC	:	Energy regulatory Commission
GDC	:	Geothermal Development Company
GDP	:	Growth Domestic Product
IPPs	:	Independent Power Producers
ISO	:	International Standardization Organization
KenGen	:	Kenya Electricity Generating Company
KETRACO	:	Kenya Electricity Transmission Company
KPC	:	Kenya Pipeline Company
KPLC	:	Kenya Power and Lighting Company
MoEP	:	Ministry of Energy and Petroleum
QM	:	Quality Management
QMS	:	Quality Management System
REA	:	Rural Electrification Authority
SCM	:	Supply Chain Management
SD	:	Service Delivery
SPSS	:	Statistical Package for Social Sciences
TQ	:	Total Quality
TQM	:	Total Quality Management

ABSTRACT

Quality management is becoming increasingly important to the leadership and management of all organizations. Provision of high quality services has attracted senior management in many organizations globally. Proper quality management can enable companies to report high productivity and increased satisfaction of all stakeholders such as employees, suppliers and customers. Managers addressing the issue of high quality in electricity tariffs can be essential in enabling power supply firms in Kenya to compete both in local and global market. However, problems related to quality of power have turned quality aspect in electricity supply to be an important competitive factor among other activities in the industry. This study intended to examine how quality and supply chain management affected service delivery in the electricity supply firms of Kenya. It relied on stakeholder theory and TQM theory and employed the descriptive research design. This study was a census of all the seven entities under energy sector that deal with electricity supply. Primary data was collected by use of survey questionnaires and study employed quantitative techniques in data analysis. The findings show that quality management was found to be statistically significant to service delivery of electricity supply firms in Kenya. Supply chain was not found to be significant in influencing service delivery, although the study pointed to a lack of strategic thinking in the supply chain departments of these power supply firms and an emphasis on legislative rules and regulations at the expense of strategy. This was interpreted to be a lack of consciousness in these departments of possible and potential ways in which supply chain can influence service delivery. The study has thus suggested further research should investigate how legislative rules and regulations hinder development and pursuit of strategy as related to service delivery. It is also suggested that further studies should be done to investigate if existence of quality standards certifications have an effect on service delivery. As is also suggested that studies should be done to investigate whether industry standards influence service delivery.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The pressure brought about by globalization has made most management to think of ways of expanding their business boundaries to new markets, accessibility to well trained personnel, areas with available of raw materials, among many other reasons, that can assist firms to be competitive (Gebremichael, 2014). In turn, this transformation can lead organizations to be able to interchange their business process with other partners and suppliers, as they rely on the capacity of high production and quality service delivery (Goetsch & Davis, 2010). Total Quality (TQ) has been defined as a “philosophy or an approach to management” made up of a “set of mutually reinforcing principles, each of which is supported by a set of practices and techniques” (Abdul-Aziz, 2014). Performance sustainability in the entire supply chain may involve sharing of information, participation, integration, communication, as well as cooperation among partners in supply chain. This can be achieved through proper application of techniques of Quality Management (QM) which supports and improves the activities of supply chain. In order to improve the service delivery of any given organization, there is need to incorporate Supply Chain Management (SCM) and QM as these help to continually improve firm’s image and satisfaction of customers’ needs (Campatelli, Citti & Meneghin, 2011).

Lassana and AbdoulayeSeck (2013) in their research based on data of 2005 asserted that African Sub-Saharan had an economic cost of 2.1% of GDP which was brought about by

electricity outages. In the year 2011, the report by World Energy Outlook, indicated that 1.3 billion people, which was equivalent to 20% of the entire population of world, had limited access to electricity in 2009. About 80% of those who were not able to access electricity resided from African Sub-Saharan and South Asia. This issue of electricity supply deficit might draw businesses backward and can as well have a negative impact economically among the third world countries. This is due to the fact that electricity is an essential input for almost every business and household. Thus, inadequate electricity can lead to low production, less competition as well as employment (Rojin, 2013).

Heizer and Render (2011) argue that quality management strategy adopted by firms focuses on achievement and sustainability of outputs which are of high quality through management practices. Kenyans are focusing more on quality as indicated by an increase in number of ISO certified firms. Energy sector has not been left behind by this paradigm shift. In present years, Kenya power has more connections, for instance, between March 2013 and June 2016 connections rose from a base of 2,261,064 to 4,890,373 customers an impressive growth of 116 per cent or an additional 2.6 million households. This represents a raised rate of electricity access in the Kenya from 27% over the past three years to 60% per cent during the current time (Chumo, 2016). However, this impressive performance in terms of increased power connectivity is not matched in terms of quality of the same. Ngina (2014) has noted that professionals in this field are very few and this makes it difficult to deliver and provide quality services to the public. World Economic Forum (2012) reported that, most people from third world economies are faced with problems of unreliable and inadequate electricity. Infotrak Research and consulting report (2017), reported that 47% of Kenyans feel that the electricity they get from Kenya Power

is either somewhat reliable or not at all reliable. In comparison to developing countries, USA for example has an average of 1 day per decade with power interruptions. On the other hand Kenya has an average of 56 days per annum with power interruptions.

Rojin (2013) outlines, some of the most energy power supply problems, as very short interruptions, being voltage, surges/spikes, long interruptions, blackouts, brownouts, harmonic interruptions, voltage swell and fluctuations, noise among others. The increase in sensitivity of the entire process has its applicability in service industry, general industrial/manufacturing, as well as residential customers (Kaziliūnas, 2010). Bloemer *et. al.* (1998) highlighted reliability and efficiency as aspects of service quality. Quality issues in the power sector can be found along the supply chain from generation to consumers. The energy sector is highly specialized and shielded from consumer scrutiny except cases of blackouts. This study sheds more light among electricity supply firms in relation to the quality in service delivery in the entire chain of supply.

1.1.1 Quality Management

The International Organization for Standardization (ISO) 9000: 2000 referred quality to “degree to which a set of inherent characteristics fulfill requirements”. Here “inherent” – as opposed to assign – “means existing in something, especially as permanent characteristics”. The “requirements” in the definition of quality can address three key aspects: technical specifications, (product standards, regulatory requirements); the requirements of quality in the products produced (conditions gotten from expectations of clients, quality), system requirements, expectations of processes of quality (process of capability to aim higher) (ISO, 2000). In addition, quality can be termed as “coordinated activities to direct and control an organization with regard to quality” (Ramos, Asan &

Majestic, 2007). Therefore, it could be important knowing that the control of quality is based on better quality polices, proper quality planning, quality assurance, quality objectives, quality improvement as well as quality control.

Ahmed (2012) argues that quality management is becoming increasingly important to the leadership and management of all organizations. Provision of high quality services has attracted senior management in many organizations globally. Companies that report high productivity have been proven to implement quality management. Quality management leads to increased satisfaction of all stakeholders such as employees, suppliers and customers. Quality Management System (QMS) is the management system part of an organization's which deals with the results achievement based on objectives of quality and needs satisfaction, requirement and expectations. This can also be described as the "management system to direct and control an organization with regard to quality". To ensure effectiveness and efficient of QMS, it is suggested by ISO 9000 that an organization should adopt eight principles of QM (ISO, 2000). The organization's practices of quality (that occur within the context or culture of quality) can be explained as those activities of which an organization or a company undertakes in order to maintain high-quality product or service (Barros *et. al.*, 2014).

1.1.2 Supply Chain Management

Chopra and Meindl (2004) described supply chain to "consists of all parties involved, directly or indirectly, in fulfilling a customer request." This can as well be referred to as a network with business entity complexities (these include: warehouses, suppliers, distributors, manufacturers, customers as well as service providers) and has involvement of the flow of downstream and upstream of information, finances and products/services

(Serdar & Tanyas, 2007). Among the supply chain's goals is the need related to customer satisfaction that leads to improvement in individual's performance in a given supply chain of an organization. Once quality is ensured among suppliers, there is guarantee of customer satisfaction, faster response to demand as well as flexibility (Sampaio, Carvalho & Fernandes, 2016).

The streamlining of supply chain in the energy sector can be done through better services being delivered to customers through a more logistic and effective manner (Bizana, 2013). The integration of service delivery in entire supply chain of Kenya's energy sector can be a possible approach which can help in improving sharing of information, visibility, synchronization as well as coordination. The integration of firms in energy sector can be done through identification of critical success factors available in whole networks which can assist in coming up with decisions to improve and innovate various business processes, and standard negotiation, which eventually lead to improvement in levels of service delivery, hence addressing customer needs. Still another approach is critically seeking efficiency and effectiveness in the networks of suppliers and manufacturers making up the supply chain among electricity supply firms which eventually shows up in service delivery of power.

1.1.3 Service Delivery

Delivery of quality services can be viewed as a multi-dimensional construct. Chorn (1991) stated that the efforts for providing quality services is aimed at improving service and quality both front and back end to be more effective. Sengupta, Heiser and Cook (2006) referred to service delivery as a crucial strategy taken by a company in present competitive business environment and the concept can be applied both in service

companies as well as product companies. On regular basis, the economic growth has been driven by service delivery among the developed nations (Giannakis, 2011). The application of supply chain management concept has been realized among many manufacturers and service organizations with the end results level of quality and cost optimization being fruitful (Song & Xu, 2011).

Sakhuja and Jain (2012) asserted that service providers have the ability of performing their own operations which would eventually help in coming up with solutions on service delivery. The integration of these services can be done based on the needs of customers or consumers. Service integrator helps in accomplishment of this task. Thereafter, the customized delivery of package of services to consumers can be done via a system that is well-managed. It is therefore important for firms under the energy sector in Kenya to integrate and coordinate their activities to enhance their service delivery to their respective clients at convenient timeframes, in a cost effective and efficient manner with the capability to maintain flexibility for any sought of variability.

1.1.4 Electricity Supply Firms in Kenya

The energy industry is referred by Voser (2011) as “an engine of growth, whose products serve as inputs into nearly every good and service imaginable”. In particular, electricity remains a leading energy consumed around the globe. This is because it is flexible to generate and to utilize (Chow, et. al., 2003). The presence of high quality electric power is therefore essential in all the operations of the modern generation. Quality of the power produced and supplied is supposed to meet customer needs and demands (Rojin, 2013). Energy Regulatory Commission (ERC) is the main regulator of the most of firms under the Kenya’s energy sector which was enacted in 2006 under the Energy Act No. 12 of

2006. The present flexibility in electricity connection in Kenya has a capacity of 1,533 MW. The supply of electricity in Kenya is from sources of hydro and fossil fuel (ERC, 2013).

In Kenya, the electricity connection across the national geographic is at 32% where within the year 2013, over 400,000 new connections were done and this accounted to a total of over 2.8 million customers by June 2014 (ERC, 2014). The energy sector implements quality management through ensuring that it provides quality services to its customers through addressing their complaints. Some of the challenges include “over-reliance on hydro power which constitutes about 70-80 per cent of the total electrical power hence this has caused the country to resort to power rationing in times of drought, limited capacity during peak demand, high cost of rural electrification, grid-system losses and weaknesses limited reach in rural areas, limited distribution capacity, and low investment in the power sector by private investors” (Ngina, 2014).

Therefore, government addressing the issue of high quality in electricity tariffs can be essential in enabling firms in Kenya to compete both in local and global market and also help them in the process of exploiting available supplementary energy sources, like such as coal, solar, bio-gas as well as wind. This has triggered the need to address the hurdles available in this industry and hence, help in coping and adaptation of changes in environment. ERC (2014) stated that two of the electricity supply companies namely Geothermal Development Company and Kenya Electricity Generating Company (KenGen) aim to raise “power output from the current 200MW, to 1 GW by the year 2018 and 5 GW to the grid by 2030. This is all against a potential of 10 GW in Kenya.”

1.2 Research Problem

The quality factor in SCM model is broad. It can be applied to entire industrial and service sectors from agriculture; manufacturing; education and research institutions; regulatory bodies; telecommunication, technology and utilities; financial institutions; energy and petroleum; hospitality and tourism; as well as commercial and services (Zagarnauskas, 2012). In Kenya's energy sector, especially power companies, frequent power interruptions, blackouts, short and long interruptions, brownouts create anxiety among small as well as big enterprises that depend on the reliability of power for their own productions and operations. Kenya Power has ability to improve quality of electricity supply as one in eight of its strategic objectives in its 5-Year Corporate Strategic Plan (2016/17 – 2020/21).

Problems related to quality of power have turned quality aspect in electricity supply to be an important competitive factor among other activities in the industry (Rojin, 2013). In adopting TQM as a quality management practice, there is need for a given power supply organization to ensure good governance and be able to carry out its operation effectively and efficiently (Al-Ibrahim, 2014). This scholar further asserted that quality commitment as well as the ability to understand the operations of supply chain can influence organization's performance. In addition, quality improvement among the activities of supply chain, can lead to reductions in cost, improvement in utilization of resources as well as the process of improving the efficiency (Sampaio, 2016). The trend in global business competition requires the management of firms and industries to strategize and warrant quality in service delivered to consumers are of high quality with right specifications. Customers are economic in nature and would like to derive better

satisfaction on money spent. This led the focus on quality management in supply chain in ensuring effective service delivery by electricity firms in Kenya.

Various empirical studies have examined the impact of quality practices, supply chain and service delivery in various sectors. For instance, a study carried out by Al-Saa'da, *et. al.* (2013) tested the effect of supply chain management on service quality of health care in private hospitals in Jordan. The results of their research revealed that there was no difference between supply chain management and the quality of health services due to gender, qualification, age, or experience. Another research done on the influence of Total Quality Management (TQM) on delivery of service in Swaziland's sugar industry by Kongolo and Dlamini (2014) showed that TQM has a possibility of enhancing service delivery and that it can lead to greater achievement and growth of an industry. On other hand, Bizana (2013) did a study on improvement of service delivery in supply chain of local government revealed that the managers experienced some hurdles in maintaining quality which included: lack of proper and integrated planning, inadequate contracts management, weak internal controls, unresponsive supply chain processes, and lack of performance monitoring and reporting. Odhiambo (2014) studied on effect of supply chain management practices and service quality among public hospitals in Nairobi County. The study led to the findings that service quality is positively correlating with SCM practices.

The importance of the electricity subsector and the firms from the reviewed studies, there seemed to be little evidence addressing quality management in supply chain to enhance service delivery. It was also apparent that some studies gave a conflicting results based on the variables used. It was expected that this study would complement the body of

knowledge by providing new empirical insights into the linkage of quality and SCM in service delivery. Therefore, this research attempted to shed some light on this issue with focus on electricity power firms in Kenya by answering the question: What is the influence of quality and supply chain management on service delivery among the electricity supplying firms of Kenya?

1.3 Objective of the Study

The main intention of the current research was to examine how quality and supply chain management affected service delivery in the electricity supply firms of Kenya.

The specific objectives of this study were:

- i) To establish quality issues along supply chain of electricity supply firms in Kenya;
- ii) To establish the influence of quality and supply chain management on service delivery in electricity supply companies;

1.5 Value of the study

The study was intended to provide information that would contribute to theories and knowledge related to quality and supply chain. More knowledge on the concept of service delivery would be added, thus making it of value to scholars, students and researchers. It will also create a foundation of reference from which many scholars might use in their studies within the area of supply chain and quality management practices in both public and private sectors in so far as they influence delivery of services. Future researchers and scholars will likely build on to the concept with further research and add to the body of knowledge in this area.

The study will provide useful insights to managers on how to handle quality issues in supply chains in order to attain the organizational goals. The research will provide useful information to non-governmental as well as governmental institutions in formulating and implementing policies for establishing effective supply chain management practices in service organizations. To development partners and donors will find it easier to commit resources when problem areas are already highlighted, as it will be easier to handle the problems thus highlighted.

To the policy makers in the firms, this study was important if it resulted in redirecting effort and resources to their supply chains to make a difference. Supply chain practitioners will appreciate their contribution to the power quality problem. The real importance of the study would be seen in shedding light on opportunities that may exist to address quality problems in the power sector by addressing quality in the supply chain.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter summarizes the theoretical review and discusses the stakeholder theory and Total Quality Management (TQM) theory. The empirical review summarizes concepts on quality, SCM and service delivery. The conceptual framework was well fitted in this chapter to establish the link between independent and dependent variables.

2.2 Theoretical Review

This section summarized reviews on the theories adopted by the study. The study therefore was anchored on stakeholder theory and TQM theory.

2.2.1 Stakeholder Theory

The establishment of the stakeholder theory was by Freeman (1984); it is argued was based on applicability to managers of firms in modern day, with an implication on the linkage to shareholders as well as stakeholders. De Villiers and Van Staden (2011) contend that a compliance platform is set up by regulation of reporting. Kock, Santalo and Diestre (2012) reasoned that if compliance is enforced, such reporting frameworks personally held managers accountable and responsible in case of them misbehaving. Further argument is based on intervention of government organs viable policies adding energy to an organization to adopt initiate related practices of good corporate governance (De Villiers & Van Staden, 2011).

In principle, stakeholder theory can help electricity supply firms in creation of ways to manage various groupings as well as relationships formulated strategically. From Freeman's (1984) viewpoint, the stakeholders' notions or management of stakeholders or their approaches to business management are formulated and implemented through process of satisfaction of various groups and individuals with business stake. The application of this theory is the management and integration of the interests and relationship of employees, shareholders, suppliers, communities, customers as well as other business related groups in electricity supply firms. Thus, the approach of stakeholder will assist the management of relationships, environment as well as promotion of interests shared to enable the development of business strategies (Harrison, Wicks, Parmar & De Colle, 2010). This theory was important to this study as it challenged the usual analysis frameworks, by suggesting shareholders' needs should be given priority.

Stakeholder's theory has been faced by many criticisms and many have based on the argument that firm's success solely depending on maximization of wealth of the shareholders is not enough since the organization is recognized as a link of implicit and explicit contracts among the organization with its stakeholders. Nonetheless, Mansell (2013) argues that application of the concept of politics to stakeholder theory, contradicts the entire principle based on market economy. Harrison, Wicks, Parmar and De Colle (2010) also made critic on stakeholder theory by arguing that it assumes that the welfares of some stakeholders are balanced or compromised among each other.

2.2.2 Total Quality Management Theory

TQM also known as Business Excellence (BE) can be referred to as systematic utilization of principles of quality management and business management tools, with the main aim being improvement of performance through the following principles: customer focus, process management, as well as stakeholder value (Ho, 2007). He further holds that everyone associated with the organization is fully committed and involved in continuous improvement to meet fully the customers' expressed and implied requirements.

The TQM, itself is a behavioural theory that primarily entails a change in an organizations' way of doing work, technology advancement, transformation of an organizations' culture and norms, values and beliefs, as well as a change in an organization's political system- decision making processes and power bases (Tichey, 1983). Cameron (1995) in a study of automotive, electronics and educational institutions and Khurana (1994) in a study of the worldwide picture of colour tube manufacturing industry found that organizations with strong quality cultures performed better than those without. A study carried out by the U.S. General Accounting Office (1991) found out that organizations that implemented the quality process advocated by the Malcolm Baldrige program coined on TQM principles experienced continuous improvement in performance indicators and exceeded the industry average in employee and customer-related indicators, operational and financial results. The TQM theory is overarching as it incorporates aspects of the other four anchors. The principles and tools of TQM can however help in ensuring that management of institutions in the energy sector perform better. However, Radin and Coffee (1993) noted that TQM cannot deliver its intentions as expected if there is failure in implementation process rather than the philosophy itself.

In addition, the theory poses difficulty in gaining a true understanding of the concept of customers or quality, and the importance of quality in business management (Japanese Union of Scientist and Engineers, 1997).

Thus, in the essence of quality management, the managers of the organizations in the energy sector in Kenya should ensure maximum customer satisfaction in terms of quality products and services given on market. This can also come about through involvement and empowerment of their employees to enhance and maintain goods and services of better quality. Therefore, to achieve such performance level, the organizations' employees should focus more on identification of customer wants/expectations, and should have good understanding of organizations' plans that can assist in achievement of their aims.

2.3 Empirical Review

This section is comprised of the various studies carried out on the concepts of quality management, supply chain management as well as service delivery.

2.3.1 Quality Management

With definitions of quality management, output is often seen as the output of management inputs in terms of practices (Flynn, Schroeder & Sakakibara, 1994), "actions and procedures" (Barros et.al (2014). The management practices, actions and procedures along a supply chain should deliver or contribute a certain level of quality to the services offered by the firms in the energy sector. Based on World Energy Outlook (2011) report, "1.3 billion people of 20 % of the world's population, lacked access to electricity in 2009". Availability of quality electricity is often interlinked to business and economic

growth. Shortfalls in electricity is said to hold back business and economic growth. It is also a key input for nearly all goods and services (World Economic Forum, 2012).

Accessibility to quality energy which is affordable and reliable within the African continent is important in poverty reduction, health improvement, increment in production, enhancement of competition as well as promotion of growth of its economies (Dames, 2012). He further affirms that insufficient supply of power mostly affects firms in private sector, and is costly to economies of nations. Therefore, the management of quality a vital tool on the entire structure of an organization as it plays a crucial role in both management as well as quality personnel (Lee, et al, 2003).

2.3.2 Supply Chain Management

Different definitions exist as far as supply chain (Sampaio *et. al.*, 2016). Stock and Boyer (2009) view supply chain as a process under which products are developed and delivered to customers. A supply chain has variously been defined as a network of relationships or as an integration of key business processes (Lambert, Cooper & Pagh, 1998). Boateng (2010) explained that “supply chain management is the seamless management of all the interlinked, value-adding activities that the delivery of goods and services entail, as they move through a value chain en route to the ultimate customer”.

Therefore, there exists relationship of supply chain and delivery of products both tangible and intangible, which include: services delivery by power firms, waste collection, tourism as well as health and education. Ambe and Badenhorst-Weiss (2011) stated that SCM could be a streamlining agent through which most sectors focus on in their various activities. SCM integrate business functions in different sectors including: finance,

forecasting, information systems, sales, production, procurement, marketing, logistics, customer service, research and development (Larson, 2009).

Within the context of Kenyan energy sector, SCM is a crucial element and therefore should obligate observation in so far as its effect on service delivery is concerned. Being a narrow concept, SCM is an important instrument in process of service delivery (Larson, 2009). Hanks, Davies and Perera (2008) noted that the operations of SCM are applicable in regulation framework put in place by various government authorities as well as available policies. Chong, Chan, Ooi and Sim (2010) together with Ellram, Tate and Billington (2007) discovered that service delivery in supply chains is based on seven theoretical processes namely: flow of information, supplier relationship management, demand management, capacity and skills management, customer relationship management, as well as service delivery management and cash flow.

2.3.2 Service Delivery

As much as provision and accessibility of services is important, even more should satisfaction of consumer needs through offering quality services. A study in Freetown, Sierra Leone by Harris *et al.*, (2012) indicated that the problems of collective action affect market imperfections and these include: decrease in systems coverage and low levels of access. They found out that most consumers prefer contacting informal service providers. The findings of Cammack (2012) and Cammack and Kanyongolo (2011) further showed that for a long duration, small number of kiosks was able to offer water services to residents and therefore, they chose consuming water from unclean sources.

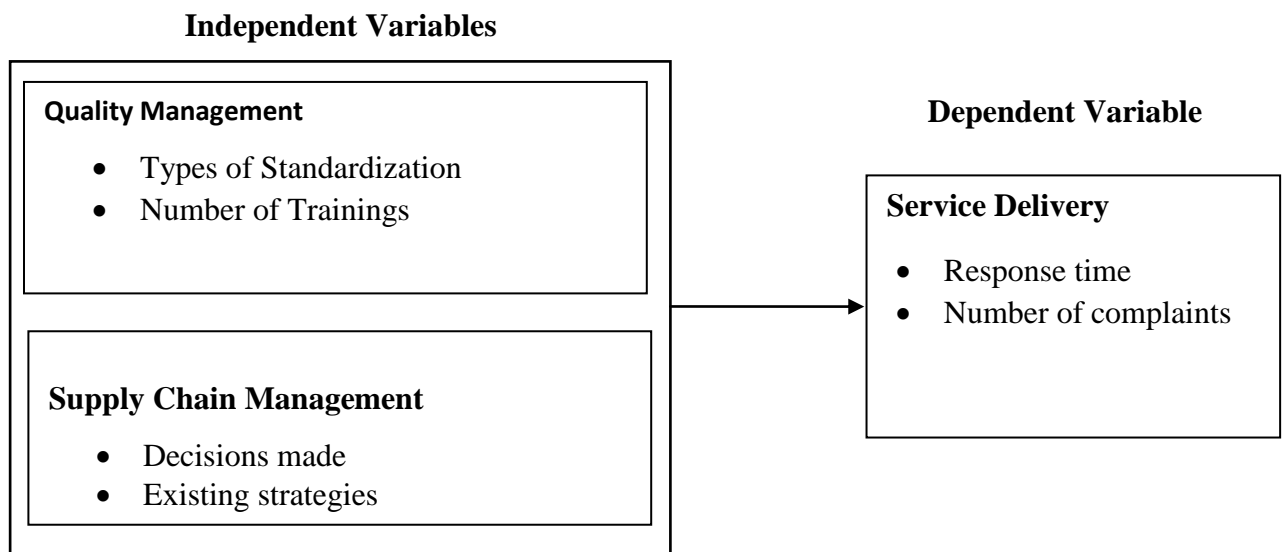
Poor responsiveness brought about by low quality can lead to delivering unrequited services to people who are in need of quality service (Gruénais *et al.*, 2009). The GNH

Survey (2008) discovered that the level to which people are satisfied differ based on different services delivered to them. It further revealed that the services being offered were of two sectors which were grouped as follows: environmental, health, and education sectors; and employment, roads, as well as power sectors. The survey observed that there was low satisfaction on the first category, especially within the rural areas in respect to environmental and social services. On other hand, there was a high satisfaction on second category and the people living in urban centres were dissatisfied in delivery of employment services.

2.4 Conceptual Framework

The main aim of this study was to analyze the influence of quality and supply chain management on service delivery in the energy sector of Kenya. From the literature reviewed by the study, the conceptual framework can be presented as illustrated in Figure 2.1.

Figure 2.1: Conceptual Model



Source: Researcher (2017)

The framework indicates that quality and supply chain management affects service delivery. Therefore, supply chain management and quality are the independent variables. On other hand, service delivery was used by the study as the dependent variable. For instance, it could be assumed that improvement in quality of any given product of services would lead to better service delivery. Likewise, an organization with improved and working business networks could be related to enhancement in delivery of services.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The methods of research applied in the study were outlined in this section. It covered the design of research, target population, sample and sampling technique, methods of data collection and analysis employed in meeting the research objectives.

3.2 Research Design

This study employed the descriptive research design. Descriptive research describes the current state of the concept to describe the available in relation to conditions or variables in a situation. Mugenda and Mugenda (2010) describe descriptive research as the data collection process so as to respond to questions of the subject under study.

The core use of descriptive statistics is description of data or information by use of numbers. The attributes the elements or groups representing the data or information are referred to as descriptive statistics (Collis & Hussey, 2009). This type of research attempts to describe factors such as attitudes, possible behaviour, characteristics and values (Mugenda & Mugenda, 2010). This design is appropriate because it enables the collection of a broad category of data (Blumberg, Cooper & Schindler, 2014). The data assisted in describing the pattern of how quality and supply chain affected changes in service delivery among the Kenya's power supply firms.

3.3 Population of Study

The larger group from which a researcher expects to use in getting the findings is referred to as the population (Nachmias & Nachmias, 2009). This study was a census of all the seven entities under energy sector that deal with electricity supply, namely: Energy Regulatory Commission (ERC), Ministry of Energy and Petroleum (MoEP), Rural Electrification Authority (REA), Kenya Electricity Generating Company (KenGen), Kenya Power and Lighting Company (KPLC), Geothermal Development Company (GDC), and Kenya Electricity Transmission Company (KETRACO) (see appendix II). These formed the population of interest where the study targeted three (3) respondents from each firm and an addition of three to cater for non-responses totaling to a sample size of 24 respondents.

3.4 Data Collection

Primary data collected by use of survey questionnaires which was administered to all the selected respondents for the study to enable gathering of information concerning various aspects of supply chain management, quality, and the aspect of service delivery. Relevant structured and unstructured questions were modified to enable gathering of the appropriate data. The tool used in collection of data comprised several parts. Part one contained the general information, part two dealt with aspects of quality management and part three entailed the features of service delivery. The drop and pick method was used in distribution of questionnaires. This study collected primary data from four employees of each of the electricity supply firms dealing with the controlling quality in supply chain management. There was a total target of 24 respondents.

3.5 Data Analysis

The answered questionnaires were edited to test for completeness and consistency prior to beginning data analysis. Quantitative techniques were adopted in data analysis. Data analysis was performed with the help of Statistical Package for Social Sciences (SPSS) version 22. Objective one was analyzed through descriptive statistics by means, percentages and frequencies. This data was then interpreted in relation to the objectives. The data is presented in tables, graphs and pie charts so as to enhance interpretation and understanding.

Objective two of this research which was to establish the effects of the quality and supply chain on service delivery in the power supply firms in Kenya, was analyzed by use of regression analysis.

$$Y = \alpha + \beta_1 Q_1 + \beta_2 SCM_2 + \varepsilon$$

Where:

Y = Service delivery (response time and number of complaints)

α = Constant

Q₁ = Quality (types of standardization and number of trainings)

SCM₂ = Supply chain management (decisions made and existing strategies)

β_1 is regression coefficients of the independent variable.

ε = Error term.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This research looked into quality, supply chain management and service delivery in electricity supply firms in Kenya. This chapter presents the research findings based on the proposed methodology. It is comprised of the following sub-sections: response rate, General information, quality management, supply chain management, service delivery as well as inferential analysis. The analysis is based on the specific objectives of the study which were: To establish quality issues along supply chain of electricity supply firms in Kenya; and to establish the influence of quality and supply chain management on service delivery in electricity supply firms in Kenya.

4.2. Response Rate

This study targeted 24 respondents anticipated to respond to survey questionnaire. However, out of the estimated figure, only 19 responded by filling in and returning the questionnaires. Thus, the projected response rate was 79.2 percent as stated in Table 4.1. For that reason, the rate of response recorded by the study was found to be fit for analysis since Mugenda & Mugenda (2010) advocates that any response rate 70% and above is considered excellent for analysis and making conclusions.

Table 4.1: Distribution of Response Rate

Responses	Frequency (n)	Percentage (%)
Responded	19	79.2
Not responded	5	20.8
Total	24	100

Source: Author (2017)

The 19 respondents who filled in and returned the research questionnaires were drawn from various electricity supply firms as indicated in Table 4.2.

Table 4.2: Distribution of Respondents

Organization	Frequency (n)
Rural Electrification Authority	2
Geothermal Development Company	2
Ministry of Energy and Petroleum	0
Kenya Electricity Generating company Limited (KenGen)	4
Kenya Electricity Transmission Company	4
Energy Regulatory Commission (ERC)	4
Kenya Power	3
Total	19

Source: Author (2017)

The sample size of the this was drawn from seven entities that deal with electricity supply in Kenya which included Energy Regulatory Commission (ERC), Ministry of Energy and Petroleum (MoEP), Rural Electrification Authority (REA), Kenya Electricity Generating

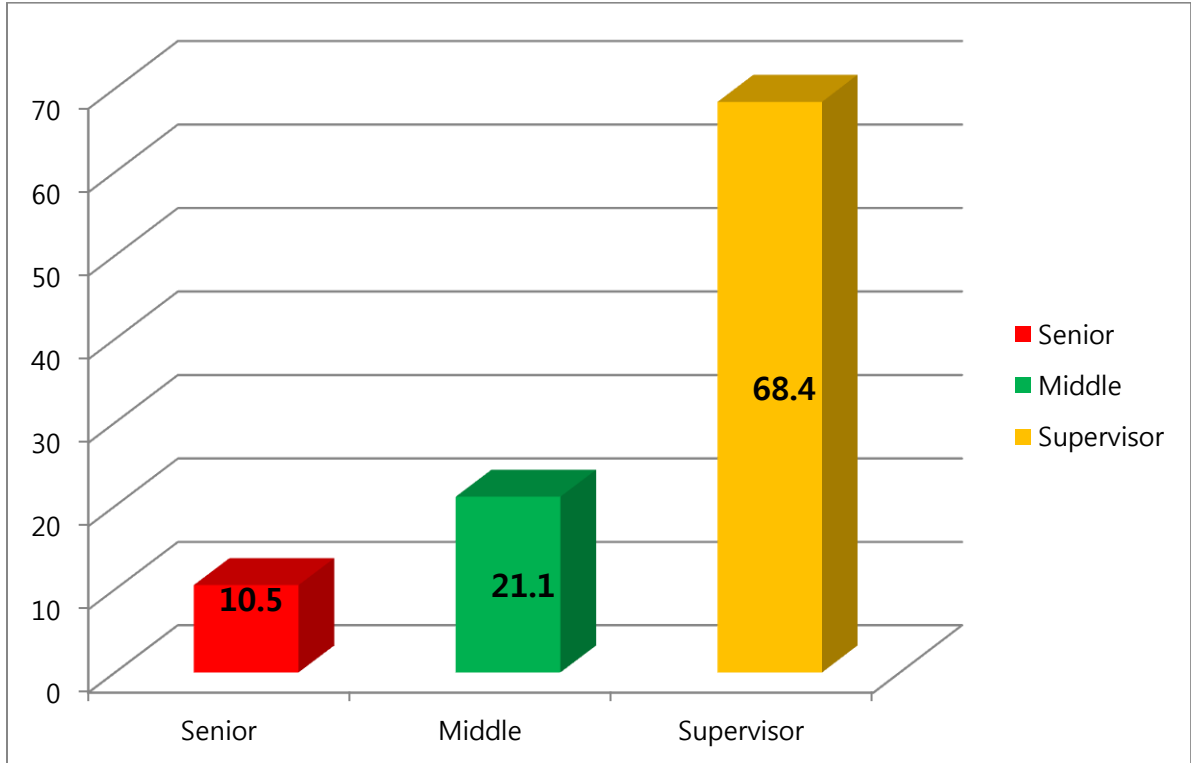
Company (KenGen), Kenya Power and Lighting Company (KPLC), Geothermal Development Company (GDC), and Kenya Electricity Transmission Company (KETRACO). The study targeted to collect data from three respondents in each firm plus another extra three to cater for a non-responsive rate. However, about five of the targeted respondents did not fill in and/or return the questionnaire. This could be due to their busy schedule in their line of duty.

4.3 General Information

4.3.1 Management Level

The results on respondent's level of management are as indicated in Figure 4.1. From the output given, it can be construed that majority (68.4%) of the respondents belonged to supervisory level. An estimate of 21.1 percent of those who responded to the survey questionnaire, were found to be middle level managers. In addition, about 10.5% of them were ranked in the level of senior management. These results could indicate that the respondents who participated in this research are managers who are likely to take part in decision making and therefore, understood the concepts under study. The study did not include the age of the respondents, but going by the findings under duration of employment, 47.4 % of the respondents had worked for a period of between 5 to 10 years. This is a pointer to the fact that respondents were not fresh from school and therefore were deemed to be knowledgeable about their respective organizations' undertakings.

Figure 4.1: Management Level



Source: Research Findings

4.3.2 Years of Business Operation

The research intended to establish the age of the electricity supply firms under investigation. From the findings given in Table 4.3, it can be deduced that majority (57.9%) of the responded interviewed had operated for a period of over fifteen (15) years as evidenced by data in table below. This has implication that most of the electricity supply companies on which the study was carried on had been in operations for a sizeable number of years and therefore a sign of business sustainability. The sector has undergone several regulatory changes that have paved way for the establishment of the electricity supply firms, beginning with the Electric Power Act of 1997, which paved way for entry of Independent Power Producers (IPPs) and also gave way to the unbundling of the

generation arm from the distribution to form two distinct companies namely Kenya Power and KenGen.

Table 4.3: Years of Business Operation

Duration	Frequency	Percent	Cum
Between 5 years and less than 10 years	6	31.6	31.6
Between 10 and 15 years	2	10.5	42.1
Over 15 years	11	57.9	100
Total	19	100	

Source: Research Findings

The more recent energy Act of 2007 paved way for the formation of Electricity Regulatory Commission and the Rural Electricity Authority. From the foregoing, these changes having only taken place in the last 20 years, it would still be too early to conclusively determine that the stability in the electricity supply firms will continue to endure, or that they will remain in their current form and structure, particularly since the entry of Independent Power Producers (IPPs).

From the findings given in Table 4.4, it can be seen that 78.9 % had worked for less than 10 years and only 21.1% had worked for over 15 years, which means a 78.9% of the workforce is recently employed, which is a pointer that these organizations keep injecting their workforce with fresh employees from the job market and therefore allowing for injection of equally fresh ideas for the electricity supply sector to take on new challenges.

Table 4.4: Duration of Employment

Duration	Frequency	Percent	Cumulative
Less than 1 year	2	10.5	10.5
Between 1 year and 5 years	4	21.1	31.6
Between 5 years and less than 10 years	9	47.4	78.9
Over 15 years	4	21.1	100
Total	19	100	

Source: Research Findings

4.4 Quality Management

4.4.1 Quality Standards in Supply Chain

The study sought to find out if the electricity firms had quality standards in their entire supply chains and the responses are as illustrated in Table 4.5. It was established that the entire respondents (100%) agreed that these companies, had some quality standards in their supply chain. Respondents cited quality standards such as QMS, ISO 9000:201, EMS, and ISO 14000. 8.3% respondents stated that their respective companies adopted quality at the source, ISO 9000 and TQM respectively. The evidence of pursuit of quality management could be seen firms practicing, continuous improvement, production or operations quality assurance, ISO certification, as well as 14001:2015, which had a representation of 4.2%, quite an insignificant pursuit of quality management.

Table 4.5: Quality Standards in Supply Chain

Responses	Frequency (n)	Percentage (%)
Yes	19	100.0
No	0	0.0
Total	19	100

Source: Research Findings

4.4.2 Types of Quality Standardization in Electricity Supply Firms

The study found out that there exist various types of quality standardization in electricity supply firms being investigated as displayed in Table 4.6.

Table 4.6: Types of Quality Standardization

Types	Frequency (n)	Percentage (%)
ISO 9001:2015	5	20.8
DSM,EMS, QMS	5	20.8
Quality at source	2	8.3
ISO 9000, TQM	3	12.5
Customer care/satisfaction	7	29.2
Production/operations quality assurance	1	4.2
14001:2015	1	4.2
Total	24	100

Source: Research Findings

As per the findings, it can be seen that about 29.2% of the respondents said that the firms from which they work from focused more on quality values related to customer care/satisfaction. The respondents whose firms focused on ISO 9001:2015 and DSM,

EMS, QMS were represented by 20.8% respectively. Similarly, an equal number of respondents (8.3%) stated that their respective companies adopted quality at the source and ISO 9000, TQM respectively. Furthermore, the firms practicing ISO certifications, continuous improvement, production/operations quality assurance as well as 14001:2015, each had a representation of 4.2%. This signifies that most of the electricity supply firms had some evidence of quality standards and observed quality in one way or another. Organizations that use these standards demonstrate that they consistently provide products and services that meet customer and regulatory requirements. Environmental Management System (EMS) on the other hand is a structured framework for managing an organization's significant environmental impacts.

4.4.3 Training in Quality Management

Table 4.7 contains the responses on the question of training on quality management. The results indicate that all the respondents under study (100%) revealed that the employees in their respective organizations had trained their workforce in quality management. This therefore, implies that all the firms under study had put in more efforts to establish and sustain quality standards achieved.

Table 4.7: Quality Management Training

Responses	Frequency (n)	Percentage (%)
Yes	19	100.0
No	0	0.0
Total	19	100

Source: Research Findings

4.4.4 Importance of Quality in Organizations

The respondents were asked to rate level of importance on the aspect of quality in organization. This was done based on the likert scale of 1 – 7 where (1) meant extremely important, (2) represented mostly important, (3) was for somewhat important, (4) was neither important nor unimportant, (5) signified somewhat unimportant, (6) represented mostly unimportant, while (7) meant extremely unimportant as shown in Table 4.8

Table 4.8: Rating Importance of Quality in Organizations

Opinion on Quality	Percentage Distribution of Responses							Total	Mean
	Extremely important	Mostly Important	Somewhat Important	Neither important nor unimportant	Somewhat unimportant	Mostly unimportant	Extremely unimportant		
Ensuring customer satisfaction	72.2%	11.1%	5.6%	5.6%	0.0%	0.0%	5.6%	100	1.7222
Enhancing service delivery	36.8%	21.1%	21.1%	0.0%	10.5%	5.3%	5.3%	100	2.6316
Improving productivity	47.4%	5.3%	10.5%	5.3%	5.3%	21.1%	5.3%	100	3.0000
Increasing market share	31.6%	10.5%	10.5%	21.1%	10.5%	0.0%	15.8%	100	3.3158
Increasing profit margins	27.8%	11.1%	11.1%	0.0%	27.8%	5.6%	16.7%	100	3.7222
Increasing price of product	5.6%	16.7%	5.6%	22.2%	0.0%	22.2%	27.8%	100	4.7222
Overall Mean	37%	13%	11%	9%	9%	9%	13%		

Source: Research Findings

It was the opinion of 72.2% of the respondents that quality is important in enhancing customer satisfaction, higher than those who thought it was important in improving productivity and enhancing service delivery at 47.4% and 36.8% respectively. The wide variance between those of the opinion that quality is extremely important in ensuring customer satisfaction and those who think it is extremely important in enhancing service delivery is unexpected because the two should go hand in hand as two sides of the same coin. An enhanced service delivery should lead to customer satisfaction.

This can be interpreted to mean that the electricity power firms perceive and pursue customer satisfaction quite apart from enhancing service delivery. It is also telling the percentage of those of the opinion that quality is extremely important in improving productivity is higher at 47.4% than the 36.8% of those of the opinion that quality is extremely important at enhancing service delivery. It is implied there is more emphasis on improving productivity, without due consideration at service delivery. It is interesting to also note that a lower percentage of 31% are of the opinion that quality was extremely important in increasing market share; perhaps a confirming that demand for power outstrips supply and there is therefore not a run for the market share.

This is also a pointer that perhaps the electricity firms are still not alive to the fact the market is now liberalized and the IPPs are having a share of what was traditionally the exclude of these electricity firms being studied. The respondents who were of the opinion that quality was extremely important in increasing the price of the product was insignificant at 5.6% and which is testimony to the reality of electricity product being homogeneous and therefore cannot be differentiated into packages customers could be willing to pay a differentiated price based on quality.

Therefore, based on the mean results, it can be interpreted that the rating of aspects on quality being ranked from the extremely important to extremely unimportant in the following order, ensuring customer satisfaction, enhancing service delivery, improving productivity, increasing market share, increasing profit margins, and finally, increasing price of product. Nevertheless, the results on overall mean of 37%, has indication that all these factors are of extreme importance to electricity firms. This could be interpreted to mean that, the applicability of these aspects in organizations can lead to an improvement in their service delivery and therefore a sign of good performance.

4.5 Supply Chain Management

4.5.1 Strategies Managing Supply Chain

The research required respondents to indicate whether there were strategies put in place by their respective organizations to manage supply chain. The results displayed in Table 4.9 show that the entire response rate acknowledged that the electricity supply firms had some strategies that facilitated supply chain management.

Table 4.9: Strategies to Manage Supply Chain

Responses	Frequency (n)	Percentage (%)
Yes	19	100.0
No	0	0.0
Total	19	100

Source: Research Findings

The responses indicated strategies in the institutions included, competitive tender, efficient contract management, delivery of services on time, reduction of operational cost, budgeting, procurement planning, industry framework, managerial focus, internal processes, unique value proposal, trainings, procurement plan, prequalification, framework contracting, cost optimization, waste reduction, value addition, supplier relationship/partnership, availability of complaints register; strict adherence to the acts, just time deliveries, long term contracts, standards, quality assurance, administrative procedures, ensuring durable products; efficiency, ISO certification; high quality products, shared responsibility, inspection of goods, category management, as well as workflow.

With the exception of supplier relationship and category management, the rest of these responses cannot be said to be procurement strategies. Most of them including competitive tender, prequalification, procurement plan, framework contracting and adherence to the act are procedures outlined in the procurement law, Public Procurement and Disposal of Assets 2015 and also featured in its predecessor the Public Procurement and Disposal Act, PPDA 2005. This is an indicator that procurement rules and procedures are hindering supply chain strategy setting and thinking. It can also be a pointer to a lack of consciousness in these supply chains of potential ways in which supply chain can positively influence service delivery in the overall organization. Still, it could be a pointer to a lack of time to devote to strategy setting and pursuit in view of the many rules and procedures that dominate public supply chains.

4.5.2 Involvement in Supply Chain Management Decisions

The research further sought to determine whether the respondents were participating in decision making as far as supply chain management is concerned. From the findings provided in Table 4.10, it is figured out that overwhelming majority (89.5%) of the respondents affirmed that they participate in supply chain management decisions and this was expected as 89.5 % of the respondents were between middle and senior management levels. The results above indicate majority of the employees working in various management levels of the electricity supply firms participate in formulation of policies related to supply chain.

Table 4.10: Decision Making in Supply Chain Management

Responses	Frequency (n)	Percentage (%)
Yes	17	89.5
No	2	10.5
Total	19	100

Source: Research Findings

4.5.3 Areas of Supply Chain Improvement

This objective sought to determine the opinion of the respondents on areas the organizations had seen improvements and their importance related to other key supply chain aspects such demand management, production flow improvement, customer relationship management, order fulfillment, supplier relationship management, customer service management, and returns management. On the scale rating of 1 being extremely important and 7 being extremely unimportant, the responded rated various areas in which in their opinion their respective electricity supply firms had improved and the outcomes

are as provided in Table 4.11. The representations were as follow: (1) meant extremely important, (2) represented mostly important, (3) was for somewhat important, (4) was neither important nor unimportant, (5) signified somewhat unimportant, (6) represented mostly unimportant, while (7) meant extremely unimportant.

Table 4.11: Rating Areas of Supply Chain Improvement

Areas of Supply Chain	Percentage Distribution of Responses							Total	Mean
	Extremely important	Mostly Important	Somewhat Important	Neither important nor unimportant	Somewhat unimportant	Mostly unimportant	Extremely unimportant		
Customer Service management	63.2%	15.8%	10.5%	0.0%	5.3%	5.3%	0.0%	100	1.8421
Supplier relationship management	47.4%	31.6%	10.5%	5.3%	5.3%	5.3%	0.0%	100	2.0526
Customer relationship management	42.1%	26.3%	10.5%	5.3%	5.3%	5.3%	5.3%	100	2.4211
Order fulfillment	52.6%	0.0%	0.0%	15.8%	10.5%	10.5%	10.5%	100	3.0526
Demand management	36.8%	10.5%	10.5%	10.5%	10.5%	10.5%	10.5%	100	3.2105
Production flow management	6.7%	26.7%	20.0%	6.7%	6.7%	13.3%	13.3%	100	4.0667
Returns management	12.5%	12.5%	12.5%	0.0%	6.3%	25.0%	31.3%	100	4.7500
Overall Mean	37.5%	18%	11%	6%	7%	11%	10%		

Source: Research Findings

The study found out that 63.2% of the respondents who participated in the study felt that customer service management was of extreme importance where supply chain has improved. Supplier relationship management follows in order of importance at 47.4%. This could be explained by the fact that suppliers in the electricity supply sector are important to the success of the supply chain owing to the lengthy periods of production expected of some of their materials such as transformers and generating sets. It is testimony to the care that the electricity supply firms should take with their suppliers to assure supply. Returns management has an insignificant showing at 12.5% and should be expected because the product of supply naturally does not result in returns. The output on the means of each aspect revealed that they were applicable in the electricity firms in the following order from the extremely important to extremely unimportant: customer service management, supplier relationship management, customer relationship management, order fulfillment, demand management, production flow management and last but not least returns management. On the other hand, the highest overall mean of 37.5% indicated that the aspects given in the Table 4.11 were found to be of extreme importance to electricity supply firms in Kenya.

4.6 Service Delivery

4.6.1 Complaints on Service Delivery

The inquiry on whether customers raised complaints on the services delivered by electricity supply firms, overwhelming majority of the respondents (89.5%) specified that there existed some complaints from the customers served on the aspect of service delivery. On contrary, 10.5% of the respondents felt otherwise.

4.6.2 Duration Taken to Respond to Complaints

The results given in Table 4.12 indicate that the minimum time taken to respond to complaints raised by customers is one hour and the maximum being 72 hours. The study found out that on average customer complaints in electricity supply firms address take 15 hours to address. In the absence of an industrial standards in the power sector, it cannot easily be determined if this is high or low. The researcher would recommend that the industry sets standards of addressing complaints so that future researches and improvement have a baseline.

Table 4.12: Number of Hours Taken to Respond to Complaints

Descriptive Statistics					
Response	N	Minimum	Maximum	Mean	Std. Deviation
Average hours taken to respond to complaints raised by customers	17	1.00	72.00	15.6364	21.02509

Source: Author (2017)

4.6.3 Number of Complaints Raised per Month

The findings on the number of complaints received from customers per month are as illustrated in Table 4.13. From these results, it can be understood that there was a minimum of one complaint and a maximum of 10 complaints per month. Moreover, the research findings show that the average complaints received from the customers of the electricity supply firms under investigation were five (5). As found in the previous section on length taken to address complaints, the number of 5 complaints is hard to interpret as low or high in the absence of a standard within organizations or the industry

and this is something that the electricity firms can set to aid future study and improvement.

Table 4.13: Number of Complaints Rose per Month

Response	Descriptive Statistics				
	N	Minimum	Maximum	Mean	Std. Deviation
Average complaints raised per month	17	1.00	10.00	5.3333	4.09268

Source: Research findings

4.7 The Effect of Quality and Supply Chain Management on Service Delivery

In order to achieve objective two of the study that established the influence of quality and supply chain management on service delivery in power generating companies, the study performed regression estimates on the relationship between predictor variables quality management and supply chain management, against dependent service delivery. The output on estimations done included: test of model's goodness of fit, Analysis of Variance (ANOVA) which was used to test the hypothesis, plus beta coefficients done to check the effect each independent variable had on dependent variable. Where, a smaller p – value (typically ≤ 0.05) was considered to have strong evidence while a higher p – value (> 0.05) was an indication of weak evidence (Rumsey, 2011).

4.7.1 Goodness of Fit

Table 4.14 contains the findings of the regression model testing the linear relationship between the quality management and supply management, and service delivery among electricity supply firms in Kenya. The results indicated in the model summary show an R^2 value of 0.448. This has implication that, quality management together with supply

management can explain 44.8% of the variation of service delivery within electricity supply firms in Kenya. Meaning that there exist some factor beside those used in this model of which when included can improve the goodness of fit of the model by 55.2%. The other factors unexplained by the models could be resources, technology, weather and even politics which might all have a bearing on delivery and reliability of the electricity.

Table 4.14: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.669 ^a	0.448	0.379	13.84129

a. Predictors: (Constant), Quality Management, Supply Chain Management

Source: Research Findings

4.8.2 Analysis of Variance (ANOVA)

In addition, the results further provided the ANOVA findings as indicated in Table 4.15.

Table 4.15: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	2487.646	2	1243.823	6.492	.009 ^b
Residual	3065.301	16	191.581		
Total	5552.947	18			

a. Dependent Variable: Service delivery

b. Predictors: (Constant), Quality Management, Supply Chain Management

Source: Author (2017)

The results presented an F- statistics of 6.492 with an acceptable $p < 0.000$. This would be interpreted as meaning that the null hypothesis that quality management and supply management jointly, have no effect on service delivery is rejected since and that the independent variables used by this study were fit in determining the influence on dependent variable indicating this as a good model.

4.8.3 Beta Coefficients

The estimations of the beta coefficients indicated in Table 4.16 reveals that quality management has a significant and positive relationship on service delivery of a given organization given a coefficient value of 0.655 ($t = 2.245$) and a p – value of 0.039.

Table 4.16: Beta Coefficients

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error				Lower Bound	Upper Bound
	(Constant)	-3.306	5.204		-.635	.534	-14.337	7.725
1	Quality Management	7.321	3.261	.655	2.245	.039	.408	14.234
	Supply Chain Management	.225	3.502	.019	.064	.950	-7.198	7.648

a. Dependent Variable: Service delivery

Source: Research findings

This would therefore mean that a unit increase in the quality management tend to improve the services offered by electricity supply firms by 65.5%. On contrary, supply chain management was found to be insignificant to determination of service delivery of a firm since it provided a coefficient value of 0.019 ($t = 0.064$) and a p – value of 0.950

Therefore, the initial regression equation used in this study was as stated below:

$$Y = \alpha + \beta_1 Q_1 + \beta_2 \text{SCM}_2 + \varepsilon$$

Where: Y was a representation of service delivery, α was the constant, Q_1 was quality, SCM_2 meant supply chain management, β_1 and β_2 were regression coefficients of the independent variables, while ε was the error term.

The resulting model can be as stated below

$$Y = -3.306 + 0.655Q_1 + 0.019\text{SCM}_2$$

The regression model output generated from the data analyzed in this research gave a new predictor model as follows:

$$Y = -3.306 + 0.655Q_1$$

It can therefore be shown that quality management as independent variable was found to be statistically significant to service delivery of electricity supply firms in Kenya unlike supply chain management. Supply chain was not found to be statistically significant to service delivery, though this cannot be concluded to be the case. This study found that there was a lack of strategic thinking in the supply chains found among electricity supply firms. Strategy thinking was found to be dominated and hindered by legislative rules and regulations. The interpretation is that supply chain could be failing in having a role at organizational level and eventually not having any influence on service delivery. The government, development partners and the electricity supply firm's puts in huge amounts of money through their supply chains and therefore this should be influence service delivery unlike the opposite results provided in this study.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides the summary of the study, findings and conclusion made in relation to the study findings. The chapter also provides the recommendations based on the findings of the study.

5.2 Summary of Major Findings

The intention of this research was to investigate how quality and supply chain management influence service delivery in the electricity supply firms in Kenya. Specifically, the objectives were to establish quality issues along supply chain of electricity supply firms in Kenya and to establish the influence of quality and supply chain management on service delivery in electricity supply firms in Kenya. The findings show that the study projected a high response rate 79.2 percent. The results on respondent's level of management revealed that majority of the respondents belonged to supervisory level. More than a half of the respondent under study stated that their respective firms had operated for a period of over five (5) years and it was observed that almost a half of the respondents were found to have worked for a period of between 5 years and less than 10 years.

5.2.1 Quality Issues in Supply Chain

Based on the findings of the study as per first objective, the study established that the entire respondents agreed that the companies where they work from had some quality standards in their supply chain. As per the findings, it was seen that most of the

respondents said that their firms focused more on quality values related to customer care/satisfaction and ISO 9001:2015 as well as DSM, EMS, QMS. Likewise, all the respondents under study revealed that the employees in their respective organizations had been trained in quality management. Based on the mean results, the aspects on quality were ranked from the extremely important to extremely unimportant the highest being ensuring customer satisfaction, followed by enhancing service delivery, then improving productivity, increasing market share, increasing profit margins, and finally, increasing price of product.

The study also found that there appeared to be more emphasis on improving productivity, without due consideration at service delivery. The low of 31% of those of the opinion that quality was extremely important in increasing market, was seen to be testimony to the fact there is a demand for power outstrips supply and there is therefore not a run for the market share but also pointing to a possibility the electricity firms are still not alive to the fact the market is now liberalized and the IPPs are having a share of what was traditionally the exclusive of these electricity firms being studied.

The respondents put procurement rules and regulations to the question of supply chain strategies in their organizations, a pointer that procurement rules and procedures are constraining supply chain strategy setting and thinking thereby failing to make supply chain count in service delivery. It can also be an indicator of a lack of awareness of the relevant procurement strategies to drive service delivery in the overall organization or a lack of time to devote to strategy setting and again in pursuit of the many rules and procedures that dominate public supply chains.

The study found also found that on average customer complaints in electricity supply firms take 15 hours to address and that there were no industry standards in the power to

determine if this was high or low. The researcher would recommend that the industry sets standards of addressing complaints so that future research and added improvement can use that as a baseline. A similar finding on the number of 5 complaints was that it was hard to interpret as low or high in the absence of a standard within organizations or the industry and this is something that the electricity firms can set to aid future study and improvement.

On decision making a majority of the respondents affirmed that they participate in supply chain management decisions, which is expected to therefore feature in influencing service delivery. However this research did not explore on possible bearing of these decisions on service delivery and more studies could be done in the area.

The study found out that more than half of the respondents who participated in the study felt that customer service management was an area of concern by most supply chain managers of their respective organizations and therefore its improvement was of extreme importance.

5.2.2 The Effect of Quality and Supply Chain on Service Delivery

The regression estimates revealed that quality management together with supply management can explain 44.8% of the variation of service delivery within electricity supply firms in Kenya. The results further presented an F- statistics of 6.492 with an acceptable $p < 0.000$. This therefore led to rejection of the null hypothesis that quality management and supply management jointly, have no effect on service delivery. Quality management was the only variable found to be statistically significant to service delivery of electricity supply firms in Kenya unlike supply chain management.

Although supply chain was not found to be statistically significant to service delivery, cannot be concluded to be the case. This study found that there was lack of strategic thinking in the supply chains departments among electricity supply firms. Strategy thinking was found to be dominated by legislative rules and regulations. This is an area where more studies could bring to light the relationship between supply chain and service delivery.

Supplier relationship management had a high showing of importance at 47.4% among those who thought it is an area of importance where supply chain has improved. This was seen as pointer to the fact stability of suppliers in the electricity supply sector is seen as important to the success of the supply chain owing to the lengthy periods of production of such as transformers and generating sets. It is testimony to the care that the electricity supply firms should take with their suppliers to assure supply. Returns management has an insignificant showing at 12.5% and should be expected because the product of supply naturally does not result in returns

5.3 Conclusion of the Study

5.3.1 Quality Issues in Supply Chain

It can be concluded that quality standards were present in all the electricity supply firms in that they all had ISO certifications. Most of the firms focused more on quality values related to customer care/satisfaction, ISO 9001:2015 and DSM, EMS, QMS. Also most all of the electricity supply firms in Kenya prioritize on ensuring customer satisfaction, which they appeared to pursue quite apart from service delivery.

Supply chain did not have strategies to positively influence service delivery and though the question of strategy in supply chain was mostly answered in the affirmative,

procurement rules and regulations appeared to constrain supply chain strategy thinking and setting. Quality in electricity supply firms can be interlinked to business and economic growth which can be construed as crucial element obligated to observation in terms of improvement in service delivery.

5.3.2 The Effect of Quality and Supply Chain on Service Delivery

The study indicates that quality management was found to be statistically significant to service delivery of electricity supply firms in Kenya. When the management of quality is done appropriately, it can strategically lead to achievement of high service delivery which can enhance competitiveness among the service industries. Provision and accessibility of services is of extreme importance, specifically, satisfaction of consumers' needs through offering quality services. Poor responsiveness brought about by low quality can lead to delivering unrequited services to people in need of quality services.

5.4 Recommendations of the Study

Informed by the findings of this study, it can be recommended that:

The management of the electricity supply firms should put more emphasis on quality practices to be able to better the service offered to their customers. This should be addressed in all the supply chain areas where services are offered.

Supply chain departments in the power supply firms in Kenya should focus on how to positively impact service delivery with appropriate quality practices and policies. This will contribute significantly in ensuring that customers are given value for their money.

The supply chain managers need to put more weight on creating strong rapport with suppliers and should insist on quality of goods supplied and services rendered in accordance with laid down guidelines of institutions.

5.5 Suggestion for Further Study

Further research should investigate if procurement legislative rules and regulations hinder development and pursuit of strategy related to pursuit of quality service delivery. Further where this study revealed quality management has a significant relationship towards service delivery, further studies should investigate possible areas within supply chain where quality could significantly impact service delivery. Further researches could be done whose data should employ use of more variables, based on larger sample size to help in generalization and better understanding of results. In addition, further studies should also be undertaken to find out if the existence of quality standards certifications, have effect on the service delivery in other service industries.

Further studies are recommended to investigate whether a lack of a competitive disposition has an effect on service delivery of the electricity supply firms. Furthermore more research could also be undertaken to determine if industry standards positively influence service delivery and also a study in procurement strategies setting and the role supply chain as a strategic function in public organizations.

REFERENCES

- Abdulaziz A. (2014). Quality Management and Its Role in Improving Service Quality in Public Sector. *Journal of Business and Management Sciences*, 2 (6), 123 - 134.
- Barros S, Sampaio P. & Saraiva P. (2014). Quality Management Principles and Practices Impact on the Companies' Quality Performance. Retrieved from <https://repositorium.sdum.uminho.pt/bitstream/1822/36224/1/V1-5.pdf>
- Campatelli, G., Citti, P., & Meneghin, A. (2011). Development of a simplified approach based on EFQM model and six Sigma for implementation of TQM principles in a university administration. *Total Quality Management and Business Excellence*, 22 (7), 691 – 704.
- Chopra, S. & Meindl, P. (2004). *Supply Chain Management – Strategy, Planning, and Operation*. Pearson Education International, (2nd Ed.), Upper Saddle River, New Jersey.
- Chumo, B. (2016). Kenya's electricity access rate now at a historic 60 per cent. *Daily Nation*, Saturday July, 23, retrieved on August 18, 2017 from <http://www.nation.co.ke/oped/Opinion/kenya-electricity-access-rate-now-at-a-historic-sixty-per-cent-/440808-3307998-p0whfa/index.html>
- Cohen, L., Manion, L. & Morrison, K. R. B. (2007). *Research methods in education*. Routledge.
- Collis, J., & Hussey, R. (2009). *Business research: A practical guide for undergraduate and postgraduate students*, (3rd ed.) New York, NY: Palgrave Macmillan
- Cooper, D. R & Schindler, P. S. (2006). *Business research methods*, 9th, edition. McGraw-Hill Publishing, Co. Ltd. New Delhi-India.
- Fukey, L. N., Issac, S. S., Balasubramanian, K., & Jaykumar, V. (2014). Service delivery quality improvement models: a review. *Procedia-Social and Behavioral Sciences*, 144, 343 – 359
- Gebremichael, B. A. (2014). Supply Chain Management for sustainable competitive advantage (SCA). *Journal of Business Management and Social Sciences Research*. 3 (2), 88 – 94
- Giannakis, M. (2011). Management of service supply chains with a service-oriented reference model: the case of management consulting, *Supply Chain Management: An International Journal*, 16 (5), 346 – 361.
- Gill, J., & Johnson, P. (2007). *Research methods for managers* (2 ed.). London: Paul Chapman Publishing Ltd.
- Goetsch, D. L., & Davis, S. B. (2010) *Quality management for organizational excellence Introduction to total quality* (6th ed. b) New Jersey: Prentice Hall

- Heizer, J & Render, B. (2011). *Operations Management*. New Jersey: Pearson Prentice Hall.
- Infotrak Research and Consulting report (2017). Public opinion on Kenya clean energy access. *Christian Aid*, Retrieved on July 20, 2017 from http://infotrakresearch.com/wp-content/uploads/2017/03/KENYA-CLEAN-ENERGY-ACCESS-POLL_-MEDIA-RELEASE-1-March-6th.pdf
- Japanese Union of Scientist and Engineers (1997, May/Jun). A manifesto of TQM - Quest for a respectable organisational presence- The TQM Committee JUSE. *Societas Qualitatis*, 11(2), 1-8.
- Kaziliūnas A. (2010). The Implementation of Quality Management Systems in Service Organizations Mykolas Romeris University, Faculty of Politics and Management, Department of Management.
- Mugenda O. M. & Mugenda A. G. (2010). Research methods, qualitative and quantitative approaches; Nairobi, Acts press.
- Nachmias, C., & Nachmias, D. (2009). *Research methods in the social sciences*. London, U.K. Hodder Education.
- Ngina N. F. (2014) Implementation of Quality Management in the Kenya's Geothermal Energy Sector; A Case Of Geothermal Development Company. *Unpublished MBA Thesis*, University of Nairobi
- Peristeris, O., Kilbourn, P. J. & Walters, J. (2015). Benchmarking supply chain management practices in a South African confectionery manufacturing organisation. *Journal of Transport and Supply Chain Management* 9(1),
- Ramos J. C., Asan Ş. S. & Majetic J. (2007). Benefits of Applying Quality Management Techniques to Support Supply Chain Management. *International Logistics and Supply Chain Congress* November 8 - 9, Istanbul, TURKIYE
- Rojin, R. K. (2013). A review of power quality problems and solutions in electrical power systems, *International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering*. 2(11).
- Sadikoglu E. & Olcay H., (2014). The Effects of Total Quality Management Practices on Performance and the Reasons of and the Barriers to TQM Practices in Turkey. *Advances in Decision Sciences*.
- Sadikoglu E. & Temur T. (2012). The relationship Between ISO 17025 Quality Management System Accreditation and Laboratory Performance. *Quality Management and Practices*, Dr. Kim- Soom Ng (Ed) Intech.
- Sampaio P., Carvalho M. S., Fernandes A. C. (2016). Quality and supply chain management: integration challenges and impacts. *International Journal of Quality & Reliability Management*, 33(4),

- Sengupta, K., Heiser, D. R., & Cook, L. S. (2006). Manufacturing and Service Supply Chain Performance: A Comparative Analysis. *The Journal of Supply Chain Management*, 42(4), 4 – 15.
- Serdar A. S., Tanyas, M. (2007). An Investigation of Complexity Management Practices In Supply Chains, *Proceedings of the 5th International Logistics and Supply Chain Congress*, November 8-9, Istanbul, Turkey.
- Silvestre, B. (2016). Sustainable supply chain management: current debate and future directions. *Gestao and Producao*, 23 (2), 235 – 249
- Song, D. & Xu, Y. (2011). Integrated Design of Service Supply Chain in the Perspective of Producer Service Outsourcing, *International Conference on Management and Service Science (MASS)*, IEEE, 1 – 4.
- Turkay M., Saracoglu O. & Arslan M. C. (2016). Sustainability in supply chain management aggregate planning from sustainability perspective. *Plos One*. 11(1)
- World Economic Forum, (2012). Energy for Economic growth: Energy Vision updates www.reports.weforum.org/energy-for-economic-growth-energy-vision-update-2012/
- Zagarnauskas, A. (2012). Developing a Supplier Performance Analysis Model. *Faculty of Economics and Social Science*.
- Zikmund, W. G., Babin, B. J., Carr, J. C. & Griffin, M. (2010). *Business research methods*, 8th ed. Southwestern, Cengage Learning.

APPENDICES

Appendix I: Questionnaire

QUALITY, SUPPLY CHAIN MANAGEMENT AND SERVICE DELIVERY IN THE ELECTRICITY SUPPLY FIRMS IN KENYA

Section A: General Information

1. What is your occupation?

2. In what management level do you belong?

Top Senior Middle Supervisor Operational

3. How long has your firm been in operation in Kenya? Please circle your answer

below.

Less than 5 years

Between 5 years and less than 10 years

Between 10 and 15 years

Over 15 years

4. How long have you been employed in your organization? Please in the boxes below.

Less than 1 year

Between 1 year and 5 years

Between 5 years and less than 10 years

Between 10 and 15 years

Over 15 years

Section B: Quality Management

5. Have your company ever practiced quality in its entire supply chain?

Yes [] No []

6. If your answer in 4 (above) is No, Please Explain

.....

.....

.....

7. If yes in question 4 (above), state the areas where quality has been practiced

.....

.....

.....

8. In your own opinion, what are the main reasons why you think quality is important to electricity supply firms in Kenya. (Please tick where appropriate)

Reasons	Yes	No
To improve productivity		
To increase market share		
To enhance service delivery		
To increase price of product		
To increase profit margins		
To ensure customer satisfaction		
Others		

Section C: Supply Chain Management

9. Is the supply chain in your firm efficient?

Yes []

No []

10. Which areas in your organization do think has improved its supply chain?

Areas of Supply Chain	Yes	No
Demand management		
Production flow management		
Customer relationship management		
Order fulfillment		
Supplier relationship management		
Customer service management		
Returns management		

Section D: Service Delivery

11. How do rate the service delivery in your organization?

Rating	Response
Very good	
Good	
Fair	
Poor	
Very poor	
Don't Know	

12. To the scale of I – V, rate the following statements on service delivery

Statements on Service Delivery	I	II	III	IV	V
Customer satisfaction is based on the quality services delivered					
Service delivery is boosted through TQM in our company					
Customers are willing to buy our products and services at higher price given it high quality.					
Through quality services offered in our entire chain of supply, our company is able to attract more customers.					
Our company has increased its profit margins due to quality products and better services offered.					
The growth of energy sector has been promoted through ensuring better quality practices.					
Better services offered has contributed to an increase in profit margins					
Power market share has increased in both local and regional market					

THANK YOU

Appendix II: The Institutional Structure of the Energy Sub Sector

1. Rural Electrification Authority (REA)
2. Geothermal Development Company (GDC)
3. Ministry of Energy and Petroleum (MoEP)
4. Kenya Electricity Transmission Company (KETRACO)
5. Kenya Electricity Generating Company (KenGen)
6. Energy Regulatory Commission (ERC)
7. Kenya Power and Lighting Company (KPLC)

Source: Ministry of Energy and Petroleum (2017)

<http://www.energy.go.ke/index.php/about-us/background.html>