INFLUENCE OF TYPES OF RISKS ON PERFORMANCE OF DISTRIBUTION PROJECTS: A CASE OF KENYA POWER AND LIGHTING COMPANY IN NAIROBI COUNTY

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A Research Project Report Submitted in Partial Fulfillment of the Requirements for the Award of the Degree of Masters of Arts in Project Planning and Management of the University of Nairobi

2016

DECLARATION

The research report is my original work and has not been submitted for a degree or any other award in any other institution.

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The research report has been submitted for examination with my approval as the University Supervisor.

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DEDICATION

I dedicate this research work to my wife Winnie and children Sylvia, Michelle, Vanessa, Alexis and Michael who have had to bear with my prolonged absence from home.

ACKNOWLEDGEMENT

I wish to acknowledge with gratitude the help I received from all those who in diverse ways made it possible for me to undertake this research and project to its successful conclusion. I wish to acknowledge my supervisor, Dr. Raphael Nyonje, for his patience and perseverance in guiding me through this research project. I am grateful to the University of Nairobi lecturers: Prof. Harriet Kidombo, Professor Christopher Mwangi Gakuu, Dr Bwibo Adieri to mention but a few, who taught me the various courses in this Master's degree program. I wish to express my gratitude to the University of Nairobi for the providing me with the opportunity to undertake this post graduate degree course. I salute the senior management of Kenya Power and Lighting Company Limited for granting me the permission to carry out my study in the organization and the staff who agreed to participate in the research project. The knowledge I have gained has made me a better manager and leader in my occupational life. I am grateful to my classmates whose constant interaction, discussions, ideas and encouragement assisted me in completing the course work and research project.

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ABBREVIATIONS AND ACRONYMS

ERC	Energy Regulatory Commission
KPLC	Kenya Power and Lighting Company Limited
NACOSTI	National Commission for Science, Technology and Innovation
PDU	Presidential Delivery Unit
PMBOK	Project Management Body of Knowledge Guide
PM	Project Manager
PMI	Project Management Institute
PRINCE2	Projects IN Controlled Environments
SGR	Standard Gauge Rail
SPSS	Statistical Package for Social Sciences
TC	Triple Constraints

ABSTRACT

The practice of project management has been with us for centuries, only in the past few decades has there been an expression in academic literature. Project management has reached a maturity level in which it is applied to many situations. It is the principal means by which operational and strategic changes are managed in contemporary organizations. Management of project risks is recognized as an essential tool in management of projects in an organization, whether profit or non-profit. In Kenya, little research exists on influence of various risk types on performance of projects in organizations within the energy and utility sector. The general objective of this study was to evaluate the influence of various types of risks on the performance of distribution projects in Nairobi County by KPLC. The study was guided by four research objectives which were: To determine the extent to which economic risk influences performance of distribution projects; to determine the influence of regulatory risk on performance of distribution projects; to establish the extent to which technological risk influences performance of distribution projects; to determine the influence of completion risk on performance of distribution projects. In order to answer these research questions, the study adopted a descriptive survey design. The target population for this study consisted of Kenya Power and Lighting Company Limited employees engaged in the planning, designing, arranging for finance and executing distribution projects within Nairobi County. A sample size of 108 respondents was selected using stratified random sampling technique to group respondents into eight strata. Data collection methods used included a set of structured questionnaires. Data was analyzed quantitatively and qualitatively and presented descriptively and illustrated by use of tables. Information was sorted, coded and input into the Statistical Package for Social Sciences (SPSS) for production of tables, descriptive statistics and inferential statistics. The response rate obtained from the study was 82 (75.93%) responses were received which was considered sufficient to draw conclusions. The study findings indicated that KPLC staff involved in distribution project activities, within Nairobi County, were keenly aware about how project performance was influenced by management of economic, completion, regulatory and technological risks.52 (63.41%) respondents agreed that the organization had systems in place for effectively managing project scope, budget and schedule,52 (63.41%) respondents agreed that the organization instituted systems to effectively manage resources allocated to projects. The Likert mean score for the responses was 3.62. The study further confirmed that there was a positive correlation between performance of distribution projects and management of economic (beta = 0.019, p=0.760), completion (beta = 0.313, p=0.000), regulatory (beta = 0.253, p = 0.131) and technological (beta = 0.253, p=0.038) risks. The study further found that 31 (37.8%) respondents agreed that the organization had instituted appropriate monitoring and control systems to ensure adequate co-ordination and control of projects while 38 (46.34%) agreed that the organization had quality control systems to ensure achievement of customer satisfaction. The study further found that an average of 42 (51.22%) and 44 (53.66%) respondents agreed with management of completion risk and technological risk respectively by the existing organizational systems. These findings led to the conclusion that quality control and monitoring and control of distribution projects within Nairobi County needed to be improved from current levels. Furthermore, the management of completion and technological risks needed to improve if performance of distribution projects within Nairobi County is to improve. The study recommends that KPLC improves management of these risks through training of KPLC supervisors, employment of qualified contractors, improving procurement systems and enhancing innovative skills through training from within and without. This will ultimately improve performance of distribution projects in Nairobi County.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

As organizations operate in local and global highly dynamic markets with new and ever changing competitive pressures and customer requirements, they frequently implement risk management practices in the expectation of addressing the challenges that arise from the changing environment (Teller, 2013).Growth in the numbers and monetary value of projects across all facets of industry has meant that the discipline of project management has undergone significant changes and improvements, including importance. The implementation of projects is challenged by management of both risks and uncertainties. Management of project risks (known-unknown) is a mature component of project management discipline. Its foundation is the triple constraint paradigm (TC-paradigm) namely: scope, schedule and cost (Lechler et al., 2013). Project risk management can be defined as the processes of conducting risk management through planning, identification, analysis, response planning and risk control (PMI, 2013). The objective of project risk management is to increase the likelihood and impact of positive events and decrease the likelihood and impact of negative events on the project. Project risk has its origins in the uncertainty present in all risks.

Globally, risk management in the context of project management varies depending on the level of maturity in project management in a particular country. The PMI Network magazine in its November 2010 edition, quoted Shelley Hurley, leader of the risk-management practice for the resources operating group of global consulting giant Accenture, USA, saying “Companies that are able to proactively assess, analyse and manage risks are better equipped to effectively manage uncertainties,”, She asserted that identifying project risks early on, enabled teams know what to look for in potential problems—and opportunities—early enough. Accenture believes an organization-wide risk-management framework is necessary to fully understand a project's risk profile and to position itself to achieve business objectives. The framework includes a robust, proactive risk assessment, analysis, reporting, feedback and monitoring process. A strong project management process that integrated with risk management made it easier to embed risk management into the culture of the organization, and the business is more open to seeing both the upside opportunities and the downside risks. This attitude towards project risk management

level is reflective of the high maturity level in project management in the US and major economies in Western Europe. In the case of China, Ms Cindy Qin, a project management professional in China, during the 2005 PMI Global Conference proceedings, noted that despite over twenty years of learning, practicing and receiving a large degree of acknowledgment and application in China, there was still a great gap between its situation in China and its application in the world. For example, she stated there was absence of project management methods and techniques in undertaking of major projects prejudice against utilization of project management skills, lack of institutional platform which did not consider early planning necessary, low level of professionalism, insufficient laws and regulation, poor practice or malpractice of project management and lack of disciplined research in project management. The consequence for lack of project management, including risk management, predisposes projects to failure in achieving project objectives and goals. She stated that design and cost overruns, wastage and theft of resources allocated to a project were common results of the failure by Chinese organizations to adopt modern project management. A possible explanation, for the apparent disconnect between modern project management and application in China, is the conflict between local cultural issues and elements of project management from the West.

Ms Serafin, in the PMI Network magazine, June 2010 edition, stated that in Nigeria, risk management was taking centre stage given the political instability in various parts of Nigeria such as Boko Haram, security and regulatory concerns, corruption, poor infrastructure and lack of professionally trained project managers in the West African country. However, lack of project management skills and management buy-in in use of modern project management means level of management of project risks was low and importation of expatriate labour proficient in project management is deemed necessary. In South Africa, project management and by extension project risk management has a greater footprint than in Nigeria. South Africa is a country classed as an emerging economy, with one foot in the first world and the other foot in the third world. The political changes begun in the early 1990s have led to enormous change including new government legislation and structures, social change and infrastructure improvements such as health clinics, low cost housing, water delivery and increased telecommunication facilities. The South African government is spending Kshs840 billion on infrastructure projects, including transport, energy and communications, in 2013-2014. By 2017, it will increase that investment by 7.9 per cent a year to Kshs1050 billion. To manage this large investment in infrastructure

including social and health there is need to engage stakeholders and manage their expectations, improved quality and quantity of project managers to manage programs and projects and the attendant risks, (Guarino and Dirie, 2014).Major project risks identified in the case of South Africa were lack of adequately trained project management practitioners who would apply project and risk management skills, stakeholder management and communication, low maturity level in project management, need for program and portfolio approach to management of the cluster of projects in order to obtain maximum synergy and lack of adequate funding.

Kenya, is currently undertaking major investments in various public projects and programs under the Vision 2030 (NECK, 2007). It is underpinned on the social, economic and political pillars. This is equivalent to infrastructure-roads, airports and rail among others and social infrastructure-political dispensation and public governance structures of the nation. The goals of the pillars are Economic-adding value to the nation's product and services, Social-investing in the people of Kenya and Political-moving to the future as a nation. The government in its development of the Vision 2030 development plan identified and acknowledged the possible risks that could hinder the successful implementation of the program. The possible project risks include macroeconomic instability, instability in governance structures, increased economic and wealth disparities, poor infrastructure by way of transportation systems, energy supplies and lack of human resource development, lack of land reforms, insecurity and lack of public sector reforms, insufficient public funding and thus need to raise funds using Public-Private partnerships (PPP).The level of project management maturity is still low with similar constraints of qualified project managers ,witnessed in Nigeria, been experienced in Kenya. President Uhuru Kenyatta created the Presidential Delivery Unit (PDU) in April 2015 to oversee the delivery of the big ticket projects. This was a clear effort by the President to stamp his imprint on the government and ensure major public projects espoused in the Vision 2030 are implemented. The unit would have the mandate of tracking and reporting on the progress of the implementation of key government projects.

In order to improve project and program performance in African countries it has been argued that six key themes are fundamental to improved program management performance. The six themes are policy, governance, stakeholders, definition, capacity and process (Eggington and Fitz-Gerald, 2012).Policy refers to government policy affecting project planning and management; governance refers to structures boundaries, roles and responsibilities and key forum and decision

makers; stakeholders refers to stakeholder engagement ,management and communication; definition refers to scope definition and related changes and alignment to strategy; capacity refers to human resource availability ,training needs, people development and use of external consultants; process refers to elements related to specific processes such as life cycle, scheduling, risk management, benefits management. As shall be seen later, in Chapter two, these themes have a strong resonance with the theoretical and conceptual frameworks that will be developed. Furthermore, the themes have a strong interdependency throughout the program and project life cycle. Under the process theme, although risk management is sometimes carried out in the preparatory stages of a project, the analysis often does not encompass the interests of all groups. For example, one project has to be scaled down because the received bids exceeded initial estimates due to the rising political tensions and the impact was not factored in the project risk management plan.

Kenya Power and Lighting Company have a major role in development of the energy sector infrastructure in the Vision 2030 plan. The key mandate of Kenya Power and Lighting Company is to plan for sufficient electricity generation and transmission capacity to meet demand; building and maintaining the power distribution and transmission network and retailing of electricity to its customers. Kenya Power and Lighting Company own and operate the entire electricity distribution system in the country and sell electricity to over 2.6 million customers as at April 2014. In performing its role of transmitting, distributing and retailing electricity throughout Kenya, the Kenya Power and Lighting Company is guided by its strategic and business plans which are closely aligned with the Government's 5,000+MW plan, under Vision 2030, as well as its other target of making electricity accessible and affordable to more than 70% of the population by 2020, compared to 35 per cent currently (KPLC, 2014).Kenya Power and Lighting Company plans to invest US$1.3 billion by 2017, particularly to support the distribution of the additional electricity that will be generated under the 5000+MW program.

According to the financial report for the year ended 2014-15, the Kenya Power and Lighting Company spent Kshs.11Bn to refurbish the distribution network and expand it. Funding for the projects will be sourced from internally generated funds and aid flows from multilateral financing institutions such as the World Bank and IDA. In order to achieve its strategic goals and attain the infrastructure investment laid out in the Vision 2030 national plan, Kenya Power and Lighting Company needs to expand on its portfolio of distribution projects countrywide and

more specifically in Nairobi County to meet the growing electricity demand. Sources of uncertainty and risk in distribution projects been undertaken by large power utilities, such as KPLC, can be stated as: multiplicity of projects been undertaken in a given period, large-scale projects that require great amount of funding, variable environmental situations and variable project delivery systems (Masudifar,2013).

Kenya Power and Lighting Company organizational structure can be described as strong matrix which reflects a blend of functional and projectized characteristics. A mixed project and functional structure, or matrix organization, is desirable for managing certain projects within desired cost, schedule and performance standards (Cleland and Ireland, 2007). Strong matrix organization structures have many of the characteristics of the projectized organization and have full-time project managers with considerable authority and full time project administrative staff (PMI, 2013).It is therefore imperative for a project-based organization such as KPLC to implement a project risk management plan that is robust with proper project risk management culture and knowledge, project team members who will be “speaking” the same language, and will leverage common analytical abilities to identify and mitigate potential risks as well as exploit opportunities in a timely fashion (Boukhari, 2013).

1.2 Statement of the Problem

Project management is the art and science of human interactions performed by one group of people to meet other people's needs. The overwhelming majority of problems in projects are due to the unforeseen consequences of intentional or unintentional human actions. People make poor estimates, forget something, communicate poorly, or make other seemingly small mistakes that conspire together to lead to larger issues (Virine, 2013) Projects in power utilities such as KPLC suffer from failure to achieve optimum performance due to decisions made by its personnel while undertaking projects Virine attributes the source of the problems to the following-overconfidence, faulty analysis and processes, biases and assumptions. A project manager who follows mandatory guidelines for time, scope, cost, risk management and other knowledge areas, should expect an improvement in the quality of the decisions made during the execution of the project and reduce chance of failure Odeh and Battaineh (2002) in their study identified major causes of project delay in the civil construction industry to several factors. The factors were related to matters such as payments for work done or lack thereof, finance availability, site

management, inadequate contractor experience, delays by the contractor, shortage of materials and labour and contract disputes The factors were categorized into eight categories namely – client related, contractor related, consultant related, material factors, labour and equipment related, contract related, contractual relationship issues and external factors. Organization and project leaders and their team members not only need to understand the importance of types of risks and opportunities that may arise in the project but they need to appreciate the causes and impacts the risks or opportunities may have on the project outcomes. Hartman and Ashrafi (1997) in their study noted that in power utilities, though measurements of project success through scope, duration, finance, quality, risk and customer satisfaction were well known, issues in respect to project selection factors were not clearly defined, poor scope management, breakdown in communications and lack of contingency planning led to poor project performance. Recent incidents during planning and implementation of several distribution projects within Nairobi County, has exposed difficulties experienced by KPLC in implementing distribution projects in Nairobi County, including re-location of a proposed substation site at the last minute due to unavailability of land, suspension of implementation of a substation due to objections by neighboring landowners (World Bank,2012). These incidents have motivated initiation of this study on the influence of various types of risk on performance of distribution projects in Nairobi County.

1.3 Purpose of the Study

The overall purpose of the study was to investigate the influence of types of risks on the performance of distribution projects, by KPLC, within Nairobi County.

1.4 Objectives of the Study

This study was guided by the following specific objectives: -

i. To determine the extent to which economic risk influences performance of distribution projects in KPLC, Nairobi County.
ii. To determine the influence of completion risk on performance of distribution projects in KPLC, Nairobi County.
iii. To establish the extent to which regulatory risk influences performance of distribution projects in KPLC, Nairobi County.

iv. To determine the influence of technological risk on performance of distribution projects in KPLC, Nairobi County.

1.5 Research Questions

The study sought to answer the following questions: -

i. To what extent does economic risk influence performance of distribution projects in KPLC, Nairobi County?
ii. How does completion risk influence performance of distribution projects in KPLC, Nairobi County?
iii. How does regulatory risk affect performance of distribution projects in KPLC, Nairobi County?
iv. How does technological risk influence performance of distribution projects in KPLC, Nairobi County?

1.6 Significance of the Study

The study, it is hoped, would provide an understanding of the influence of types of risk on performance of distribution projects in Nairobi County.

The findings of the study are aimed at assisting management of KPLC in improving delivery of the objectives of distribution projects, in Nairobi County and even countrywide, by minimizing on project risk and maximizing opportunities. In addition, it is hoped, it will assist current and future researchers understand better how the various risk types affect development and implementation of distribution projects within power utilities and what risk mitigation measures or opportunity enhancers can be pursued.

1.7 Limitations of the Study

There were a number of limitations in this study that included deliberate refusal by some of the identified respondents to respond adequately to the survey questionnaire despite written and oral assurances by the researcher and even approval of the respondent's employer. A second limitation was the possibility of limited inferential use or utility value of the results of the study. The researcher mitigated the effects of this limitation by ensuring the scope of the research considered variables that are widely common to the power utility sector. The limitation of time

was mitigated through adoption of a descriptive survey design and using a data collection tool that would enable collection of sufficient quantifiable data at minimum cost and shortest time possible.

1.8 Delimitation of the Study

The study targeted an organization within the energy and utilities sector, specifically M/s KPLC, and how various specific risks, namely, economic, completion, regulatory and technological risks influences performance of distribution projects in KPLC within the geographical area of Nairobi County. The study did not explicitly cover other categories of risk types, such as force majeure or operational risks, however the interdependent nature of risks permits a limited inference of this study results to other risks types not considered. The chosen design methodology for the study is descriptive survey design as it was considered most amenable to the data that would be generated by the survey.

1.9 Basic Assumptions of the Study

The following assumption were made while preparing and conducting the research: the respondents had a basic awareness of the various types of risks that affect the distribution projects they handle in their daily work activities and they have a desire to achieve improved project outcomes by managing these risks and opportunities proactively.

1.10 Definition of Significant Terms

Completion Risk: Risk that a project fails to achieve completion due to financial or technical difficulties.

Economic Risk: Risk that a project fails to achieve financial viability during construction, completion or operation.

Project Management: Is a series of activities, which involve application of management principles and existing capabilities to deliver a predefined scope of work within agreed timescales and costs to achieve desired benefits, goals and objectives.

Project Performance: Defined as the degree to which a project achieves the desired goals and objectives within the planned scope, duration, quality and cost.

Project Risk Management: includes the processes of conducting risk management planning, identification, analysis, response planning, and controlling and mitigating risk on a project.

Regulatory Risk: Risk that a project may not achieve completion, desired outcomes or goals due to failure to observe established legal statutes or compliance requirements.

Technological Risk: Risk that a project facility fails to perform according to set specifications or becomes prematurely obsolete on account of the technology used in operation.

Triple Constraint Paradigm: The three constraints in a project: scope, schedule and cost.

1.11 Organization of the Study

The report contains five chapters and an appendices section. Chapter one provides the background to the study, statement of the problem, purpose of the study, objectives of the study, research questions, significance of the study, limitations of the study, delimitations of the study and basic assumptions. The chapter also contains definition of significant terms used in the study.

Chapter Two discusses the literature on concepts of risk and uncertainty in project management, responses to risks and opportunities by organizations, benefits in applying risk management techniques and tools, types of risks and mitigation measures and the theoretical and conceptual framework for the study is examined

Chapter Three provides a description of the methodology used for the study. The research design and sampling techniques used in the study are explained. The method of sample selection and determination is also explained. The methods of data collection, analysis and presentation are discussed. The chapter is concluded with the operational definition of variables, which attempt to associate the objectives with the methodology.

Chapter Four contains the presentation to the findings, arising from data analysis using the techniques described in Chapter Three and concludes with a detailed interpretation of the findings.

Chapter Five presents the summary of the study findings, discussions, conclusion and the research recommendations. The chapter contains a section on suggestions for further studies arising from the study findings and contributions to the body of knowledge. The appendices section contains the introductory letter to respondents and research questionnaire.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews both theoretical and empirical literature related to the study. The chapter cites existing literature on concepts of risk and uncertainty in project management, responses to types of risks and opportunities by organizations and benefits in applying risk management techniques and tools. The theoretical and conceptual frameworks are reviewed. The chapter concludes by highlighting the knowledge gaps of the study.

2.2 Concept of Risk and Project Performance

A project is set up to change a given initial situation. Risk and uncertainty are greatest at the start of the project and decrease over the life of the project as decisions are reduced and deliverables are accepted by the project owner (PMI, 2013). During the course of the project, different factors can be influenced in order to achieve the project goal. Project activity is undertaken in an environment of uncertainty arising from a range of sources including technical or operational issues, commercial or financial constraints, management issues and external dependencies (Hillson, 2006). Uncertainty which has potential to affect achievement of project goals is seen as a cause of risk and influences success of a project. Robustness to uncertainty is important when we concentrate on the pernicious possibilities entailed by the unknown. However, opportunities can be propitious and surprises can be beneficent.

The notion of opportunity is not directly addressed by the TC-paradigm since uncertainty and risk are not differentiated.TC-paradigm is based on the notion of optimization rather than maximization (Lechler et al, 2013).Other project management practitioners and academics view uncertainty as encompassing both foreseeable and unforeseeable circumstances and focus on the aspect of uncertainty that is foreseeable—namely, risks (Teller, 2013).A good project manager will maximize opportunities which arise during project planning and execution. Practitioners of project management have realized the connection between risks, risk management and achievement of project objectives (Hillson, 2006). Since projects are a tactical means for organizations to achieve their strategic mission and vision, it then follows that project risk management is a process by which project managers are able to increase likelihood of achievement of business success through projects.

The two most popular models for project management approaches in identifying and managing project risks are the PMBOK® Guide and PRINCE2. These methods outline a project-manager driven process for risk identification and management. The processes are, first, define and identify the risks, second assess and analyze the identified risks using qualitative and quantitative methods, third, plan appropriate risk responses and implement the responses, fourth, manage and control the risks and fifth, review the risks by updating the risks register and communicating with stakeholders, determine effectiveness of the agreed responses and review the entire risk process (Griffiths and Stevens, 2013).Excellent project risk management enables a project better probability of staying on track, project team members to be empowered in their decision making ability and eventually been successful (Margules, 2013).Project risk management exists to address risk exposure and lead to an acceptable and manageable level of risk (Hillson, 2006). Risk exists when a threat and vulnerability overlap. A risk process is usually considered to begin with a risk event and end in a risk consequence, (Deng, 2014). Risk is not the same as uncertainty. Lechler et al (2013) states that classical project management has not clearly defined the concept of uncertainty or distinguished the difference between risk and uncertainty. Lechler supports the non-ergodic theory, which recognizes that some form of uncertainty cannot be reducible to measurable or estimated risk. This means practically that there is no information available today about every single event and therefore the future is not fully calculable.

Uncertainty can be described as the unknown-unknown. Risk arises when uncertainty has the potential to affect project objectives. Objectives can be used as a measure of project deliverables or success. Project success is measured as adherence to the triple constraints objectives of scope, duration and cost with addition of other constraints such as quality, risk and resources and utility value to the expected beneficiaries. Measurement involves using a predetermined and defined baseline before the project is started or modified. The project manager's perspective is to ensure that the project does not deviate from the predetermined baseline or predetermined success criteria, (Lechler et al, 2013). Project objectives are often represented by a project's baseline and therefore only possible to identify and evaluate risks if the project objectives are defined. Consequently, it follows that project risk management is a tool for ensuring the project fulfills the set success criteria. There are uncertainties that cannot affect objectives and which are therefore not risks (Hillson, 2006). Known risks are those that have been identified and analyzed, making it possible to plan responses for those risks. Known risks that cannot be managed

proactively are transferred to a third party together with ownership of the response or alternatively avoided completely by the project team. Mitigation of risk involves the project team taking measures towards reducing the probability of occurrence or the impact of a risk (PMI, 2013). Risk threshold refers to measures along the level of uncertainty or the level of impact at which an entity may have a specific interest below which the entity will accept the risk; above that level, the entity will not tolerate the risk. A project is acceptable to stakeholders if the level of risks is within tolerances and can be balanced out with possible rewards from undertaking the project.

Indeed, forward thinking organizations do not seek to avoid risks because they recognize the relationship between risks and rewards. A “zero risk” project does not exist and is not desirable either since the available benefits are determined to a large extent by the degree of risk (Hillson, 2013). Risk avoidance is a risk strategy where the project team adopts measures of avoiding the risk including changing the project implementation plan. Risk acceptance is where the project team acknowledges the risk and does not take any action when the risk occurs. Risk transference is a risk response strategy where the project team shifts the impact of a threat to a third party together with ownership of response. The development of appropriate measures for handling risk is essential to enhancing an organization’s capacity to bear risks. Salomo et al (Teller, 2013) stated that identification of risks aids in estimation of a precise and reliable risk level being prepared for materializing risks and therefore decrease the negative effects of risk. The relationship between project objectives, risk and uncertainty ensures that risk management is an important contributor to project success and achievement of organization strategy (Hillson, 2003). A project practitioner or manager needs to identify risks that threaten the project and develop strategies of control the risks through mitigation. In addition, the PM has to communicate with stakeholders early and as often as necessary and explain the nature of the risks, (Alderton, 2014). Stakeholders, among others, are sponsors of the project, financiers and beneficiaries of the project. Project managers and stakeholders who are not aware or understand the risks that could affect a project are powerless to do anything about it. Risk management has developed into a mature discipline with its own processes, tools and techniques and consensus, across professional disciplines, over the main concepts and practices, (Hillson, 2003).The attitude to risk by the organization and PM is influenced by a number of factors broadly classified into three themes: risk appetite, risk tolerance and risk threshold, (PMI, 2013).Risk

appetite is the degree of uncertainty an entity is willing to take on in anticipation of a reward. Risk tolerance is the degree, amount or volume of risk that an entity will withstand.

The presence of project risk creates surprises throughout the project life cycle affecting everything from technical feasibility to cost, market timing, financial performance and strategic objectives, (Thamhain, 2013). As globalization of business activities has increased, organizations have engaged in partnerships with other entities to leverage on such partnerships and deliver project objectives in shorter durations. This has increased project risks several times as the source of risks is not just the technical part of the project but now involve social, cultural, technological and organizational (Thamhain, 2013).This approach to project risk has led to a shift in project risk management paradigm to now view project risk management as part of the organization efforts to achieve tactical and strategic goals through projects (Hillson,2013) and to assist the PM view sources of risk from a far wider field than the traditional sources, (Thamhain, 2013).Figure 1 illustrates that in order for a strategy to change a vision into realizable benefits their needs to be implementation of programs and projects. The programs and projects will provide deliverables aligned with organization's strategy. The methods of managing programs and projects to achieve the deliverables are at the tactical level. The deliverables can be new products or services or increased competitive strengths or even maximizing throughput from existing operations.

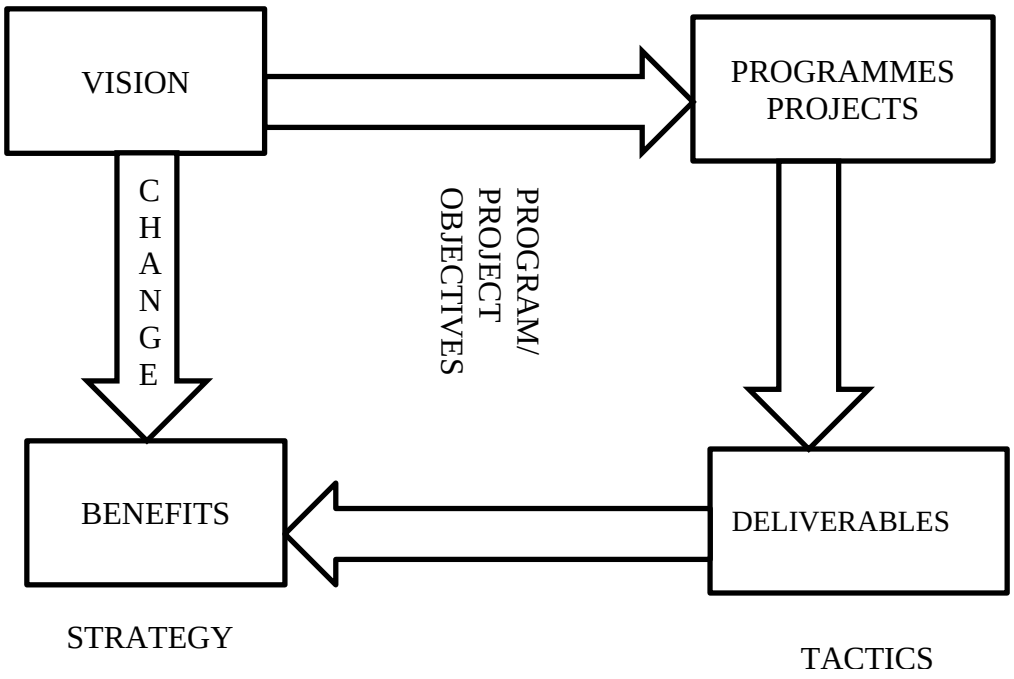

Figure 1 Strategy-Vision-Benefits and Tactics-Project-Deliverables.

Adapted from *Integrated Risk Management as a Framework for Organisational Success,* Retrieved May 2016 from the Project Management Institute Website: http://www.pmi.org/learning/integrated-risk-management-framework-organizational-success-7980 . Copyright 2006 by Project Management Institute. Adapted with permission.

Figure 2 illustrates how effective project risk management at the tactical level enhances the likelihood of realizing the deliverables and therefore expected business benefit to the organization.

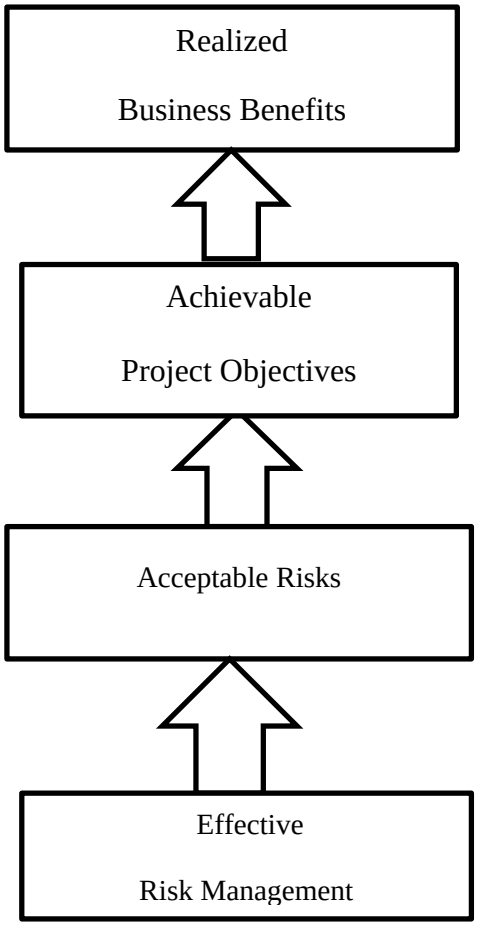

Figure 2 Link between Risk management and Business benefits.

Adapted from *Integrated Risk Management as a Framework for Organisational Success,* by D.Hillson. Retrieved May 2016 from the Project Management Institute Website: http://www.pmi.org/learning/integrated-risk-management-framework-organizational-success-7980 .Copyright 2006 by Project Management Institute. Adapted with permission.

2.3 Economic Risk and Project Performance

Projects are financial and strategic investments initiated to improve shareholder value and can only be successful when they deliver their expected business returns (Kay, 2014).Economic viability of a project will primarily depend on the marketability of the project's output, in terms of price and volume (Finnerty, 2013).To evaluate marketability, the sponsor of the project will apply financial engineering techniques to help in identifying the essential components to be considered by decision-making process and risks. The components to be considered include the

projected supply and demand conditions over the expected life of the project facility, review of competitors' products and cost of production, analysis of the expected life cycle for project output, expected sales volumes and projected prices and possibility of technological obsolescence.

The study analyses whether under given economic conditions, demand for goods or services from the project asset will be at a price that will cover the full cost of production, enable the project to service its debts and provide an acceptable return to the project sponsor. The element of risk and uncertainty therefore comes into play when attempting to judge whether a project is economically viable. A good risk analysis explores a variety of input values and paints a picture of a variety of possible outcomes and the probability of occurrence of those outcomes (Heerkens, 2014). The outcomes to understand are expressed in terms of business metrics such as Net Present Value (NPV), internal rate of return, payback period or total cost of ownership. Payback period, also known as time-to-money period, is a measure of risk and more aligned with organizational liquidity. The longer the payback period, the riskier the project becomes. A risk adverse company may have a smaller payback period stipulation, perhaps a cutoff period of less than two years, than one more tolerant and open to more risk (Kay, 2014).

A decision to start a project and even hold on to the facility requires only one instance in which the present value of continuing to hold the asset exceeds the residual or scrap value (Farrell, 2002). The inputs used to calculate these business metrics are called "sensitivity factors." When considering the benefits side of the benefit-versus-cost equation, logical possibilities might include increase in revenue, increase in margins, head count reduction, materials savings, lower distribution costs and cost avoidance (precluding legal/regulatory penalties). Sensitivity factors related to short- and long-term items of cost could be project implementation costs, increase in operating costs through inflation, increases in support costs, cost of poor quality, productivity losses and warranty work (Heerkens, 2014). Understanding costs and identifying risks are among the first steps when taking on any project and it requires an in-depth assessment of any new or unknown variables. The less one knows about the benefits and costs associated with a project, the more likely an unviable project could be approved.

It should be noted that the flip side to economic risk is economic opportunities. If there is an increased demand for products or services from a project asset, then increasing the project scope is valuable because it gives the project sponsor room to increase production if market conditions

turn out to be favorable. Economic viability will be demonstrated by the project asset generating sufficient revenues to cover all capital and operating costs and to service project debt in a timely manner (Finnerty, 2013). Mitigation of economic risks involves project sponsors employing hedging purchase of product contracts, tariffs to secure future revenue margins (Finnerty, 2013).

A case study in Thailand where a power plant project secured guarantees from key customers before ground was broken, assuring a fair return on investment. However, local dissenters in the form of local environmentalists blocked the roads to the proposed power plant on environmental grounds and caused delays in its construction, this resulted to return on investments projections quickly become moot. Interest is accruing on the loan whether or not crews are working. Indeed, the World Bank estimates that delays totalling one year can lower projected returns by up to one-fifth (Ingebretsen,2002). A similar situation may prevail here in Kenya where the Government of Kenya sourced for bids from private developers to build, own, and operate coal fired power station in Lamu. In September 2014, the development rights were awarded to a consortium, Amu Power Company, to commence development of the Lamu coal plant. Construction was expected to begin in September 2015 and last approximately 21 months. Once constructed, it will be the largest single power station in Kenya. The project is expected to cost USD 2BN with Chinese banks providing sixty per cent of the funding. However environmental and legal challenges from within and without Lamu threaten to delay the commencement. The health of the global economy affects the health of projects. In many countries, economic volatility is wreaking havoc on projects. A grasp on economic trends can help project professionals stand out by proving they can help navigate the chaos and improve the bottom line. In Portugal, member of the European Union, public projects are being suspended all over for reassessment, and more than 20 public-private partnerships are being re-analysed with banking and public-sector projects being rescheduled and reorganized. This has made it necessary for the construction sector to re-evaluate their investments, because they are the partners in most of the public-private partnerships (Hunsberger, 2011).

2.4 Completion Risk and Project Performance

Completion risk entails the risk that a project might not be completed. Completion risk has a financial and technical aspect. Financial aspect of completion risk occurs when the financial requirements to complete a project escalate due to rise in inflation, shortages of critical supplies

in executing the project, underestimation of construction costs that cause an increase in capital expenditures needed to enable completion to operational level and rendering the project financially unsustainable. Technical aspect of completion risk occur when the technical processes employed in project execution are found to be technically infeasible or environmentally objectionable (Odeh and Battaneih, 2002). The processes could include breakdown in supervision of the contractor. Mitigation in both aspects include provision of guarantees in technology employed in the project during execution and operation, furnishing by project contractors of performance guarantees to cover against failure to complete the project (Finnerty, 2013).

A case study on effects of completion risks on projects is the proposed Umaa dam in Kitui County. Umaa dam is to be located along River Nzeu, 7kms north east of Kitui town. The 28m high dam when completed was intended to store 870,000m^3 of water and inject an additional 2,500m^3/day of water to Kitui town and serve about 75,000 people. However due to design flaws and differences in implementation methods between the contractor and National Water Conservation and Pipeline Corporation, construction work at the site has been suspended for the past five years. To revive the project, the original project cost of Kshs 825MN will need to be increased to Kshs1.4 BN due to cost overruns (Ochami, 2011). A second case study on completion risk is the construction a new runway at Denver International airport to accommodate large wide bodied commercial jets like the Airbus 380. Project managers for the Denver International Airport (DIA) knew that if these jets were going to be as popular as predicted, the facility had to support the flying giants. When DIA opened in 1995 with five commercial runways, architects already had planned a sixth to support non-stop, year-round flights from Europe and Asia. However, several challenges occurred which threatened the completion date including the September 2001 terrorist attacks, varying soil conditions at the project site, inhibited funding from the aviation authority, revised completion schedules from the project sponsor and severe cold weather (Allshouse et al, 2004). The project was however completed ahead of schedule due to prudent management by the project contractor. The project was completed and opened for commercial air traffic on Sept. 4, 2003, eighteen days ahead of the original schedule.

To ensure success, in terms of meeting tight deadlines and maximize the probability of success, the project planner must first establish a realistic expected completion date — defined by the

project's Critical Path — with no regard for an arbitrary end date. Selectively compress the required sequence of tasks by judicious resource management and prudent risk taking. To ensure “on time” project completion, the plan must also accommodate the uncertainties of task execution. This is achieved by compressing the Critical Path to meet an earlier end date than specified — effectively establishing a schedule contingency (Hamburger,1987).

2.5 Regulatory Risk and Project Performance

In earlier years of the 60s,70s and as late as the 90s in developed and developing countries such as Kenya, during implementation of industrial construction projects such as large power distribution substations, the project manager concerned himself with traditional items such as financing, technical scope and specifications, staffing, and other traditional problems. Matters concerning obtaining environmental permits were unfamiliar and unheard of. However, in recent years ensuring that a project complies with legal and regulatory requirements is the norm rather than exception. Failure to do so can mean the difference between a viable project and one which is not implementable. The regulatory process includes, at a minimum, the development of environmental impact reports or statements, permit applications, public hearings, and permit issuance. It also includes compliance with other miscellaneous requirements of agencies having jurisdiction over the siting, engineering, construction, startup, and operation of a new facility, (Eveld, 1981).

Compliance to legal and regulatory requirements is a must irrespective of the project size. It is important to recognize that the regulatory process starts at the inception of any project. From the project owner’s viewpoint, it is in his best interest to involve professionals early, even before site selection. Real and emotional problems connected with the project have to be considered. The Project owner needs to engage qualified staff or expert consultants for these services. The project manager should pay particular attention to requirements of the regulatory process during proposal preparation. The proposal should include allocations of resources for regulatory process activities. Consequently, the project manager should take special care to advise the owner of any problems associated with compliance to regulatory and legal requirements, especially if the project has a tight schedule. The time delays and added requirements inherent in the implementation of the regulatory process may become more critical than the execution of other work. Regulatory risk is closely aligned to political risk in the sense that regulations can be

varied by authorities to the disadvantage of project implementation and eventual use. The project manager should learn as much as possible about the laws, regulations, policies, and precedents applicable to a project since the opposition groups are usually well informed on such matters. If the project manager is not prepared to answer questions which the opposition groups will raise, his credibility will be in serious jeopardy. Opposition groups frequently use the regulatory agencies as an umbrella to stop or delay programs. In other words, they may use certain procedures and permit requirements to thwart the program. For example, local residents can lobby their political leadership to block implementation of a project on fears of environmental damage. In other instances, government may decline to approve higher prices for services or products, generated by the project asset and used by the public, to avoid economic and political chaos. It therefore requires a project leader to evangelize a clear vision to stakeholders, understand the project objectives and align them with stakeholders' values and monitor how project decisions directly affect stakeholder value (Turner, 2007).Mitigation of regulatory risks is through : study and know the laws and regulations applicable to the project, including which courts may get involved in case of litigation, make early contact with representatives of the appropriate agencies to determine and verify their agency's requirements and discern whether the attitude of the agency toward the proposed project is favorable, unfavorable, or undecided, recognizing the changing attitudes and even jurisdictions of the groups and public bodies which will be affected by the project, monitoring the attitude of the regulatory agencies, legislators, local agency representatives, and changing legislation and regulations, including in the project's technical documentation, the conditions precedent to the approvals obtained from the regulatory and having people who are recognized in their particular field as experts but yet have the ability to listen intelligently and sympathetically to the public. KPLC as part of measures in ensuring regulatory approvals are obtained in a timely manner released a Resettlement Policy Framework for power projects in 2012 (KPLC, 2012) to assuage concerns of multilateral donors such as the World Bank. The purpose of the policy framework was to clarify resettlement principles, organizational arrangements, and design criteria to be applied to KPLC projects that have potential for involuntary resettlement. Management of regulatory risks includes aspects of safety and health of project team members and that of the public within the project environment. Planning for safety encompasses all health and safety conditions in the project site. Adequate planning not only decreases the chances for project delays and the possibility of injuries, but also

increases the potential for success and the confidence of team members, (Bonyuet,2001).Safety planning is used to protect the project team staff, anticipate possible dangerous situation and bypass hazards, guide evaluation of the safety condition of the project environment, determine minimum requirements, equipment and tool needed to perform specific activities and meet or exceed legal obligations for safety and health conditions in the work place. In respect to safety and health, KPLC, in 2007, established a dedicated Health, Safety and Environment ("HSE") department headed by a manager and staffed by environmental and social specialists, socio-economists, safety engineers and officers. The department was established purposely to provide guidance to project and operations teams on aspects of socio-environment regulatory requirements and safety at workplace and monitor adherence to set regulatory requirements.

A case study of how regulation poses risk to an organization's ability to finance its program and projects is when KPLC submitted a request to the regulator ERC for an upward adjustment of electricity retail prices on 04th February, 2011.The regulator turned down the request citing inefficiencies in the electricity distribution sector. An uproar was raised by the public over the KPLC request for tariff increases. The objections by the regulator and the public culminated in the request been shelved for two years, by which time the financial health of KPLC was declining under the weight of increased operational and capital expenditure costs. In 2013, an urgent request was brought up by KPLC management, to the ERC, for an increase in retail electricity tariff rates, who projected declining revenues and increasing operating costs would hamper growth of the company (Odhiambo, 2013). It required a lot of effort from management to convince the regulator and the incoming Jubilee government to approve the request for a raise of retail electricity tariffs, albeit in two stages (KPLC, 2014, pp.16).

A second case involved introduction of the legal framework related to the regulatory governance of the energy sector in Kenya through an act of parliament, the Energy Act of 2006. The act consolidated all laws relating to energy and provided for among other things: creation of the current regulator ERC and the splitting of KPLC, which previously handled generation, transmission and distribution of electricity to form a new entity called KenGen. KenGen which was purposed to take-over and carry on the business of generation which hitherto was been handled by KPLC.

2.6 Technological Risk and Project Performance

The development of new technologies and the implementation of such technologies in new applications is a continuous effort to close technological and logistical knowledge gaps. This introduces risk generated by the lack of knowledge and its resulting uncertainty (Regev et al, 2006). If a project requires new or unproven technology, test facilities or a pilot plant will need to be constructed to test the feasibility of the processes involved (Finnerty, 2013). Technology risk arises when the unproven technology is applied on the scale proposed for the project fails to perform as expected or experiences obsolescence prematurely. The use of tested technology eliminates unexpected technological surprises and risk. The design and ultimately the technical feasibility can be influenced by other factors such as the environment and costs of the new technologies to be utilized. Conversely, where risks are greatest then the project sponsor will expect a higher return for the use of unproven technology by way of increased productivity or service level using efficient production technology. Mitigation against technological risks is carried out through use of external consultants who advice on the efficacy of the new technologies and furnishing of operational performance guarantees by the project contractor, ensuring all stakeholders, including customers, lenders and project sponsors, are appraised on the need for the new technology and its benefits (Finnerty,2013;Pourian and Woody, 2015).Each project's level of risk can be determined by the mix of three interrelated indexes: the market (M), the product (P), and the technology (T). Thus, each project can be given a specific "MPT" index. On this basis, a traditional product being newly developed has a low MPT, (Pourian and Woody, 2015). As the project technology moves towards basic research and nontraditional product lines, the perceived risk of the project increases. A project with relatively high "MPT may increase the rate of return required by the lenders.

A classic case of introduction and application of new technologies is the on-going Mombasa-Nairobi Standard Gauge Railway (SGR) rail track project been undertaken by China. The single-track standard gauge railway between Mombasa and Nairobi will have a route length of 472km and a total length of 609km. It will run through the counties of Mombasa, Kilifi, Kwale, Taita-Taveta, Makueni, Kajiado, Machakos and Nairobi. Construction of the 609km-long line began in October 2013 and is scheduled to be completed by December 2017, ("Mombasa-Nairobi Standard Gauge", n.d.). The Mombasa-Nairobi SGR is the biggest infrastructure project in Kenya since independence. It will shorten the passenger travel time from Mombasa to Nairobi

from more than ten hours to a little more than four hours. Freight trains will complete the journey in less than eight hours. The Class 1 line will have a superior design catering to robust and low-maintenance requirement. The new line will run parallel to the existing meter gauge railway and the Mombasa-Nairobi Road or A109 Highway for the most part. It will deviate at certain points to attain the desired gradient and curvature. In the rail industry, the proliferation of standards, a complicated vehicle acceptance process, and the need for access to the rail infrastructure for testing purposes all add to technological risks and uncertainties, creates delays and generates the need for additional design modifications during the project. A further key characteristic of complex projects is the need for a breadth of knowledge that spans areas in which the project recipient, Kenya Railways, previously has little or no experience. This will demand that technology transfer by way of training in design, operation and maintenance of such new technologies be incorporated in the overall project planning and implementation including provisions of technical guarantees on performance.

A second case study in introduction of new technologies in the electrical power utility involves the successful design, installation and commissioning of the first gas insulated distribution substation (GIS), with a capacity of 90MVA, in Kenya. The substation located in Upper Hill, Nairobi was commissioned in May 2014 and contract conditions required major technical guarantees to be provided by the project contractor, from China, to ensure the substation performance and benefits were achieved as per agreed design specifications. The benefits included reduced demand for land as the substation required forty to fifty per cent less space than a similar sized Air Insulated Substation (AIS). As in the case of SGR, technology transfer is a requisite condition.

2.7 Theoretical Framework

The project management theory developed by Hanisch and Wald (2011) provides a suitable framework for this study as it brings to the fore the effects of a project on surroundings and surroundings on a project. The theory describes and explains these effects in three dimensions namely: design, goal and context. The design dimension reflects endogenous factors of project management and can be further sub-divided into the sub-dimensions of: -strategy and structure, project management and organization and culture and social processes. Goal dimension is a view which regards projects as value addition processes for an organization. This dimension views

project success not only as fulfillment of the triple constraints of time, budget and scope but also stakeholder satisfaction. Project goals are the desired results of the project subsumed within the sub-dimensions of value addition and adaptability. The theory states that the goal dimension is strongly dependent on the outcomes of the measures in the design dimension and the external effects from the context dimension. The context dimension refers to exogenous factors affecting projects and project management. The factors are external to the project and cannot be influenced directly but have to be integrated into the management of the project if it is to achieve the set goals and objectives. These factors comprise the political, economic, social, technological, legal and environmental elements that shape the organization's macro environment. Hanisch and Wald further categorized the context dimension into sub-dimensions of complexity, dynamics and uncertainty. Uncertainty is closely related to complexity and dynamics. Complexity and dynamics lead to higher uncertainty and therefore risks. Figure 2.3 is a pictorial showing how the endogenous dimensions of design and goal and exogenous dimension of context relate to each other and their interdependence. It provides a framework illustrating how project performance is influenced by the dimensions of goal, design and context.

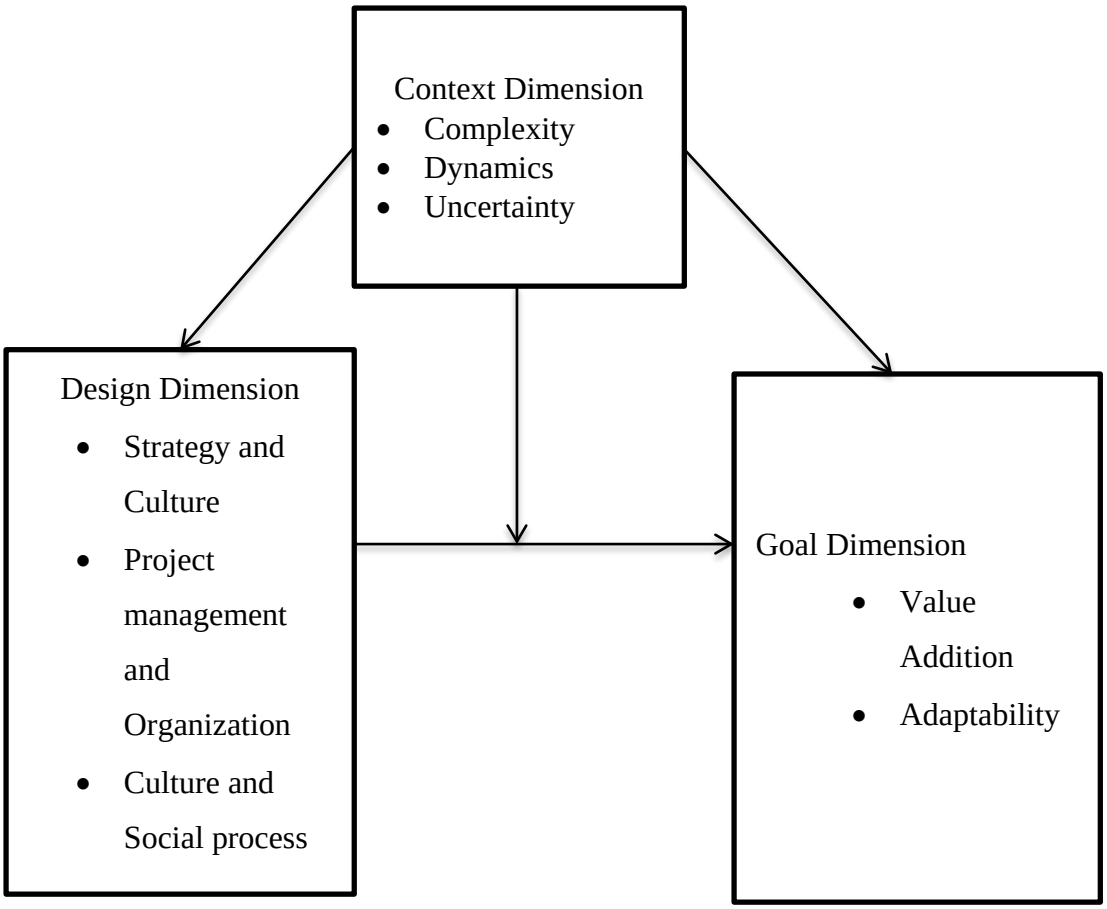

Figure 3 Theoretical Framework.

Adapted from *A project management research framework integrating multiple theoretical perspectives and influencing factors* by B. Hanisch and A. Wald. Retrieved May 2016 from the Project Management Institute Website *Project Management Journal, 42(3), 4-22.doi.10.1002/pmj.20241*. Copyright 2011 by Project Management Institute. Adapted with permission.

2.8 Conceptual Framework

The conceptual framework in figure 2.4 shows the interrelationships between the variables. Independent variables are factors influencing the dependent variable in the study. The independent variables are parameters to be measured and their effect on the dependent variable –

project performance-determined. The moderating variable is risk management quality. From the literature review, five independent variables have been identified-economic, completion, regulatory and technological risks.

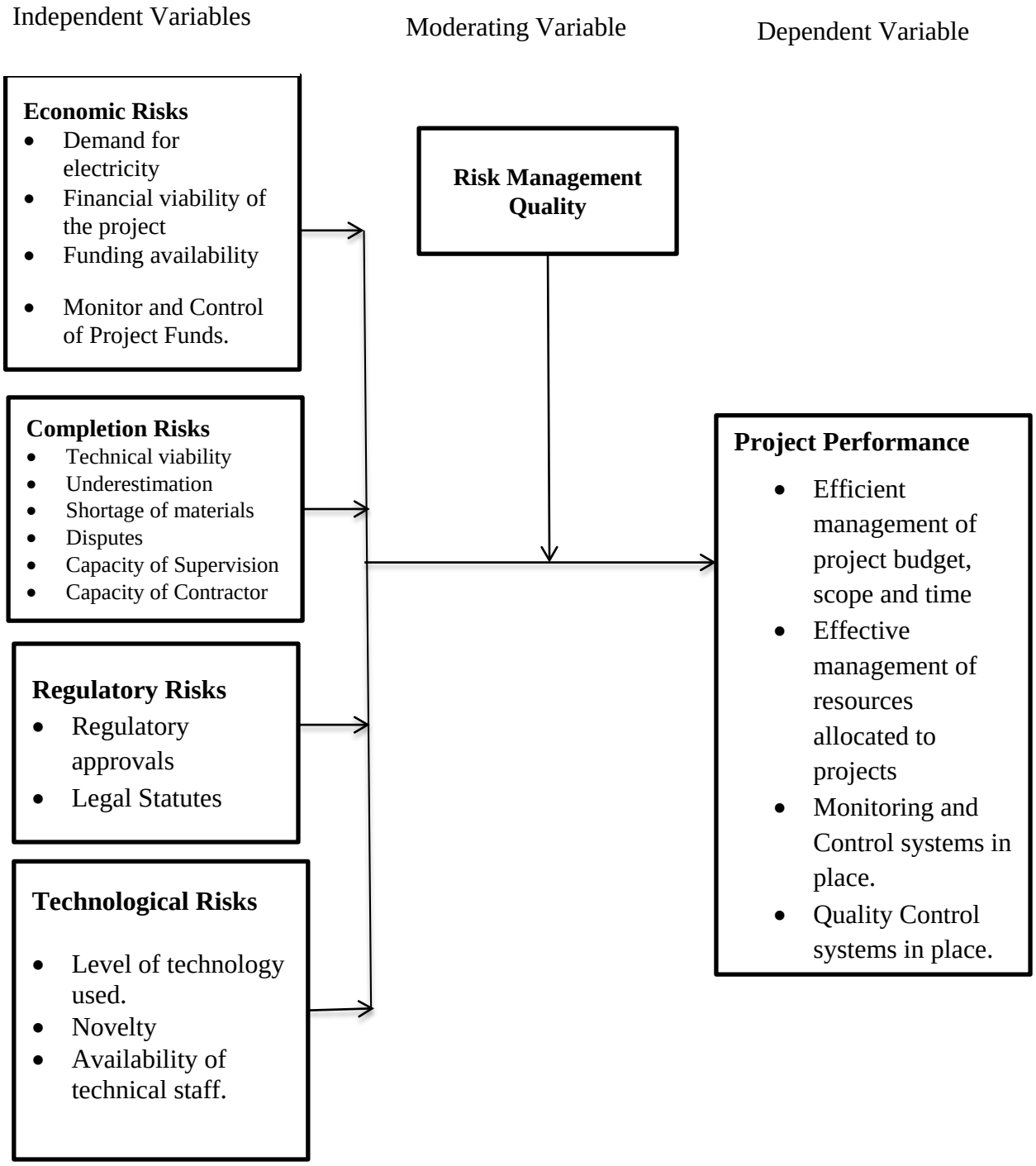

Figure 4 Conceptual Framework.

2.9 Knowledge Gap

The independent variables in this research expected to influence project performance are economic, completion, regulatory and technological risks. The expected outcome is successful project performance when the four risks are assessed and managed effectively in an integrated manner. Ondari and Gekara (2014) in their study on factors influencing road completion success, observed that inadequate funding, capacity of contractor, capacity of supervision and design specifications were a major source of failure to complete road projects. These factors have been identified, in this research, as sources of completion risk. The study by Ondari and Gekara was however limited to road construction projects. Macharia and Ngugi (2014) in their study on determinants of successful completion of power projects in KPLC observed that information technology was a determinant in successful project completion among other variables. Their study however did not consider other risks- economic, completion and regulatory risks- that were been considered in this study. Furthermore, their study confined itself to information technology when considering technological risks. Ndirangu (2013) in his study on how project management skills, politics, socio-economic factors and government bureaucracy influenced successful completion of projects implemented by KPLC on behalf of the government of Kenya. The study was restricted at the corporate and national level. In addition, the research project did not study the causal effect between specific risks and project performance and completion. It is hoped this study will yield new knowledge on how the combination of specific types of risk-economic, completion, regulatory and technological risks influence performance of distribution projects in Nairobi County.

2.10 Chapter Summary

This chapter has reviewed concepts of risk and uncertainty in project management, responses to risks and opportunities by organizations, benefits in applying risk management techniques and tools, types of risks and mitigation measures. In addition, the theoretical and conceptual framework for the study is examined in this chapter. A review of the theoretical framework has examined the interdependency of dimensions in project content and context and how risk fits in the overall picture. The conceptual framework has examined how types of risk influence project performance. The next chapter looks at the research methodology including the study design, study population, sampling technique, data collection and analysis.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research methodology that was used to carry out the study. Here, the researcher aims at explaining the research design method, selection of target population, calculating the sample size and sampling procedure adopted, the data collection methods and procedure and the research instruments tools that were used. Further it describes how validity and reliability was enhanced in the study, methods of data collection as well as data analysis procedure. The chapter concluded with an explanation of how ethical issues were adhered to.

3.2 Research Design

The research design selected for this study was descriptive survey design. In descriptive research, the data is collected without changing the environment. The major purpose of descriptive survey research is description of the state of affairs as it existed during the time of survey. The main characteristic of this method of research is that the researcher has no control over the variables. The researcher can only report on what is happening or has happened. Survey was preferred in this study since it sought information on an existing phenomenon with regard to identifying the influence of types of risk on performance of distribution projects in Nairobi County. According to Mugenda and Mugenda (2003) survey research is a self-report study which requires the collection of quantifiable information from a sample obtained from the target population.

3.3 Target Population

All the items under consideration in a field of inquiry constitute a ‘universe’ or ‘total population’ (Kothari, 2004). Mugenda and Mugenda (2003) describe a target population as the population to which a researcher seeks to generalize the results obtained from the inquiry. The target population in the study was 149 personnel, working for KPLC in Nairobi County. The personnel were identified from a staff list maintained by the Human Resources division. Their duties are

closely involved with project activities ranging from planning and implementation of projects, supervising internal and external contractors, approving finance for the projects, logistics and procurement, legal, property, wayleaves, safety, health and environment. The target population was divided into eight strata as illustrated in Table 3.1.

Table 3.1 Composition of Target population.

Strata	Frequency	Percentage (%) of Total Target Population
Planning, Design and Maintenance	51	34
Finance	12	8
Procurement and Logistics	7	5
Projects and Construction	40	27
Wayleaves and Survey	12	8
Property, Risk and Legal, Insurance	12	8
Safety, Health and Environment	8	5
Customer Service and Marketing	7	5
Total	**149**	**100**

3.4 Sample Size and Sample Selection Procedure

This section describes the sample size and sample selection used in the study.

3.4.1 Sample Size

Kothari (2004) defines a sample size as the number of items to be selected from the target population to constitute a sample. For this study, the researcher adopted the Krejcie and Morgan (1970) method as shown below, for calculation of the sample size, S as follows: -

Eqn 1 Sample Size Formula

$$S = \frac{X^2\ NP(1-P)}{d^2(N-1) + X^2P(1-P)}$$

Where N, Population size = 149

P is proportion of units in sample size possessing the variables under study, for this research study it is set at 50% (0.5);

X^2 is the table value for chi squared at one degree of freedom at the desired confidence level of 95% = 1.96^2 = 3.8416

d, is the degree of precision desired for the research study which is set at 5% (0.05)

From a target population of 149, 5% precision level and 95% confidence level, the formula yields a sample size, S, of 108.

3.4.2 Sample Selection Procedure

The study adopted a stratified random sampling in recognition that the population from which the sample was drawn is not homogeneous. In this technique, the population is stratified into a number of non-overlapping sub-populations or strata and sample items are selected from each stratum. As shown in Table 3.2, the size for each stratum in the sample is proportional to its percentage share of the target population.

Table 3.2 Sampling Frame

Strata	**Sample Size**
Planning, Design and Maintenance	37
Finance	9
Procurement and Logistics	5
Projects and Construction	29
Wayleaves and Survey	9
Property, Risk and Legal, Insurance	9
Safety, Health and Environment	5
Customer Service and Marketing	5
Total	**108**

3.5 Data Collection Instruments

The study used primary data collected through the use of questionnaires. The proposed questionnaires were structured and composed of close ended, multiple choice questions. The multiple responses provided a list of possible alternatives from which the respondents were required to select the answer that best describes their situation. It was expected the responses from the respondents would provide as honest answers as possible and generate quantifiable data. A similar questionnaire was administered to all the respondents.

3.6 Piloting of the Study

The instrument for capturing the primary data- the questionnaires were tested before they were used. The pilot test brings to light the weaknesses, if any, of the questionnaire and checks if the questionnaire contains simple but straight forward directions for the respondents so that they may not experience any difficulty in answering the questions. The aspects evaluated in the pilot test included: availability of the subjects under the study, acceptability of the questions, willingness to co-operate of the potential respondents, potential errors in the instrument and correction of the errors or format of the questionnaire. According to Mugenda and Mugenda (2003), a pre-test sample of a tenth of the sample size, for each stratum with homogeneous characteristics, was considered for the pilot study. For the study, 11 staffs, from the targeted population, were chosen. The questionnaire was administered twice over a period of one week. Staffs chosen for the pilot study were subsequently excluded from the sample The study adopted the Cronbach's Alpha (α) method as a measure of internal consistency for reliability. A value of 0.7 was used as the cut-off for reliability of the study. The results of the calculations using SPSS are shown in Table 3.2

Table 3.3 Cronbach's Alpha (α) Test Results

Cronbach's Alpha	Number of Items	Cronbach's Alpha (α)
Project Performance	4	0.779
Economic Risk	4	0.715
Completion Risk	6	0.744
Regulatory Risk	3	0.807
Technological Risk	7	0.764

3.7 Validity of the Instrument

Validity is the degree to which an instrument measures what it is supposed to measure. Kothari (2004) describes it as the extent to which differences found with a measuring instrument reflect true differences among the sample or target population being tested. The aspect of validity to be considered in this study is content validity of the instrument. Content validity is considered suitable for this study as the target population are familiar with distribution project activities and associated project risks and participate in implementation of various aspects of distribution projects in their daily duties. The issues addressed in regard to content validity were: adequate coverage of the research topic by the questionnaire, how comprehensive was the questionnaire in gathering of data needed to address the purpose and goals of the study? In order to test and enhance the validity of the questionnaires, the researcher selected at least two KPLC employees randomly, from each stratum, and discussed the contents of the questionnaires. The comments from the KPLC employees and the project supervisor's advice was used to make necessary corrections to the instruments to ensure they conform to the study objectives and answer the research questions adequately.

3.8 Reliability of the Instrument

A measuring instrument is reliable if it provides consistent results. A reliable measuring instrument contributes to validity, but a reliable instrument need not be a valid instrument. The stability aspect of reliability is concerned with securing consistent results with repeated measurements of the same person and with the same instrument (Cronbach, 1951). The degree of stability is determined by comparing the results of repeated measurements. The closer the value of Cronbach's Alpha is to unity, the more reliable the instrument. For this study, a value of 0.716 was achieved during piloting of the study.

3.9 Data Collection Procedure

In order to collect primary data from the targeted respondents, the researcher acquired a letter of authority from the University of Nairobi after examination and approval of the research proposal. The letter enabled the researcher to obtain a permit from NACOSTI under the Ministry of Education, Science and Technology. The letter was presented to the General Manager, Human Resources and Administration who issued a letter of authority for data collection at various

KPLC branches and offices within Nairobi County. This allowed the researcher to conduct the research freely. An introductory letter accompanying each questionnaire was sent to respondents within the sample. The questionnaires were administered through drop and pick method. To ensure a high response rate, the researcher responded to clarifications sought by the respondents.

3.10 Data Analysis Techniques

The term analysis refers to the computation of certain measures along with searching for patterns of relationship that exist among data-groups (Kothari, 2004). Mugenda and Mugenda (2003) observe that data analysis is the process of bringing order, structure and meaning to the mass of information collected. Data analysis involved the process of coding, editing, data entry and monitoring of the collected data. The completed questionnaires were edited for completeness and consistency. The data was coded to enable the responses to be grouped into various categories. The data collected was analysed using descriptive statistics. The descriptive statistics used are frequencies, counts and percentages. SPSS and MS Excel are the computer software tools that in carrying out analyses. Tables were used to summarize responses for further analysis and to facilitate comparison. Qualitative data analysis sought to make general statements on how categories or themes of data are related. Key research questions were used to guide the analysis of qualitative data collected from analysis. Inferential analysis was used to identify emerging patterns and develop them into themes. Pearson's Product Moment Correlation was used to determine whether there is any positive or negative relationship between the dependent and independent variables.

A multiple regression model was used to link the independent variables to the dependent variable as follows;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu$$

Where;

Y =Project Performance

X_1 = Economic Risk

X_2 = Completion Risk

X_3 = Regulatory Risk

X_4 = Technological Risk

In the model, β_0 is the constant term while the coefficient β_i where i = 1….4 was used to measure the sensitivity of the dependent variable (Y) to unit change in the predictor variables.

μ is the error term which captures the unexplained variations in the model.

3.11 Operationalization of Variables

Table 3.4 Operationalization of Variables

No.	Variable Name	Nature of Variable	Variable Indicators	Unit of Measure	Data Collection Method	Type of Scale	Type of Analysis	Level of Analysis
1.	Economic Risk	Independent	Demand for electricity Financial viability of the project Funding availability	5-point Likert Scale	Questionnaire	Ordinal for primary data	Quantitative Qualitative	Frequencies Descriptive analysis Inferential analysis
2.	Completion Risk	Independent	Technical viability Underestimation Shortage of materials Management of Contract disputes Capacity of Supervision Capacity of Contractor	5-point Likert Scale	Questionnaire	Ordinal for primary data	Quantitative Qualitative	Frequencies Descriptive analysis Inferential analysis
3.	Regulatory Risk	Independent	Regulatory approvals Legal Statutes Safety, health and environment	5-point Likert Scale	Questionnaire	Ordinal for primary data	Quantitative Qualitative	Frequencies Descriptive analysis Inferential analysis
4.	Technological Risk	Independent	Adequate tools and equipment Innovation Availability of skilled personnel	5-point Likert Scale	Questionnaire	Ordinal for primary data	Quantitative Qualitative	Frequencies Descriptive analysis Inferential analysis
5.	Performance of Project	Dependent	Effectively manage project budget, scope and time Effective use of allocated resources Monitor and Control systems Quality control systems	5-point Likert Scale	Questionnaire	Ordinal for primary data	Quantitative Qualitative	Frequencies Descriptive analysis Inferential analysis

3.12 Ethical Considerations

Research ethics refer to the appropriateness of the researcher's behavior in relation to the rights of the potential respondents, and the research work itself. Ethics emerge from value conflicts which are expressed in many ways: individuals' rights to privacy versus the undesirability of manipulation, openness and replication versus confidentiality, future welfare versus immediate relief, and others. In this study, the principle of voluntary participation was observed through seeking informed respondent consent, providing an assurance to the respondent regarding confidentiality of information that was obtained as well as an assurance phrase in the introductory letter and on the questionnaire.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presents the empirical findings of the study and results of the application of the variables using techniques mentioned in chapter three. The data analysis was based on specific objectives, where patterns were investigated, interpreted and implications drawn on them.

4.2 Questionnaire Return Rate

Table 4.1 Questionnaire Return Rate

Response Rate	Frequency	Percentage (%)
Returned	82	75.93
Unreturned	26	24.07
Total	**108**	**100**

Table 4.1 summarizes the questionnaire return rate.108 questionnaires were circulated to randomly selected respondents in the target population. 82 were duly completed and returned. A response rate of 75.93% was therefore achieved. According to Mugenda and Mugenda (2003) and Kothari (2004) a response rate of 50% is considered adequate for a descriptive study. The results indicate that the respondents appreciated the importance of the study and were willing to contribute and learn from the results of the study.

4.3 Demographic Characteristics of Respondents

The preliminary information gathered regarding the characteristics of the respondents were: gender, years employed in the organization, level of education, position in the organization and the department one belongs. The information was meant to give an insight into the nature of the respondents.

4.3.1 Gender of Respondents

The respondents were asked to indicate their gender. The results of their responses are shown in Table 4.2

Table 4.2 Gender of the Respondents

Gender	Frequency	Percentage (%)
Male	59	72.22
Female	23	27.78
Total	**82**	**100**

The results show that 52 (72.22%) respondents were male and 23 (27.78%) respondents were female. This indicates that majority of staff engaged in activities related to electricity distribution projects, in Nairobi County, are male. This reflects findings by a report by USAID (Cain et al, 2016) which noted that 20% of KPLC staffs countrywide were women. The report noted that despite increased numbers of women joining the KPLC training school, the proportion of female staff in the technical field was still a minority.

4.3.2 Length of Employment

The respondents were asked to indicate the years of service they have been in the employment of the organization. The results of their response are shown in Table 4.3.

Table 4.3 Length of Employment at KPLC

Length of Employment	Frequency	Percentage (%)
Less than 1 year	9	10.98
2 to 5 years	15	18.29
6 to 10 years	21	25.93
Over 10 years	37	45.12
Total	**82**	**100**

The results indicate that 9 (10.98%) respondents had worked at KPLC for less than a year, 5 (18.29%) respondents had worked for a period of between two to five years, and 21 (25.93%)

respondents had been in service for a period of between 6 to 10 years while 37 (45.12%) respondents had been in the organization for over 10 years. The findings indicate that at least 71% of the employees have been serving the organization for more than 6 years. This implies that the respondents have a good working knowledge of the activities and processes related to electricity distribution projects in Nairobi County. This reflects the organization's ability to retain qualified human resource necessary to implement project goals and strategies set by the organization.

4.3.3 Education Level of Respondents

The respondents were requested to state their highest level of education. The results of their responses are shown in Table 4.4.

Table 4.4 Level of Education

Education Level	Frequency	Percentage (%)
Postgraduate	6	7.41
Undergraduate	43	51.85
Diploma	33	40.74
Other	0	0
Total	**82**	**100**

Study findings indicate that 6 (7.41%) respondents had attained postgraduate qualification, 43 (51.85%) respondents had attained an undergraduate degree and 33 (40%) respondents had attained a diploma level. The findings imply that the respondents had attained the requisite level of education necessary for one to effectively participate in activities related to electricity distribution projects. This included training in electrical engineering, project management and finance. This confirms the need for the organization to recruit in skilled manpower capable of using existing and new technologies during implementation of distribution projects. The observed level of education contributed to receiving better quality responses to the survey questionnaire.

4.3.4 Position of Respondents

The respondents were requested to indicate their positions in the organization. The results of their responses are shown in Table 4.5.

Table 4.5 Position of Respondents

Education Level	Frequency	Percentage (%)
Top Management	17	20.73
Middle Management	44	53.66
Supervisory Level	9	10.98
Union	12	14.63
Total	**82**	**100**

Results indicate that 12 (14.63%) respondents were unionisable employees, 9 (10.98%) respondents were supervisory level and 44 (53.66%) respondents were at middle management level and 17 (20.73%) respondents were at top level management. The findings imply that the responses were well spread among staff. The findings further indicated that respondents within the organization structure appreciated the value of the feedback from the survey to themselves and other stakeholders within the organization.

4.3.5 Department of the Respondents

The respondents were requested to state the departments they work in within the organization.

The results of their responses are shown in Table 4.6.

Table 4.6 Department of Respondents

Department	Frequency	Percentage (%)
Planning and Design	29	35.37
Finance	5	6.10
Procurement and Logistics	4	4.88
Projects and Construction	22	26.83
Wayleaves and Survey	6	7.32
Risk and Legal	7	8.54
Safety, Health and Environment	3	3.66
Customer Service and Marketing	3	3.66
Property	2	2.44
Insurance	1	0.93
Total	**82**	**100**

Results in Table 4.6 indicate that 29 (35.37%) respondents were from planning and design, 22 (26.83%) respondents were from projects and construction, 7 (8.54%) respondents were from risk and legal, 6 (7.32%) respondents were from wayleaves and survey, 5 (6.10%) respondents were from finance , 4 (4.88%) respondents were from procurement and logistics, 3 (3.66%) respondents were from safety, health and environment , 3 (3.66%) respondents were from customer service and marketing , 2 (2.44%) respondents were from property and 1 (0.93%) respondent was from insurance. The results indicate that the respondents were well spread in all departments and therefore the responses were not biased towards one organizational department. The spread further implies that the organization needs to develop and adopt a project risk management plan that has proper risk management culture and knowledge coupled with a team that will speak the same language in terms of managing potential risks as well as exploiting opportunities, (Boukhari,2013).

4.4 Descriptive results

This section is arranged based on the objectives of the study.

4.4.1 Project Performance

The general objective of the study was to determine the extent and influence of types of risks on the performance of distribution projects in KPLC within Nairobi County. This section tested the views of the respondents regarding the performance of distribution projects in Nairobi County.

Table 4.7 Project Performance

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Likert Mean
KPLC has systems in place for efficiently managing project scope, budget and schedule.	10	6	12	40	14	3.87
KPLC has instituted systems to effectively manage resources allocated to projects.	11	10	9	44	8	3.72
KPLC has instituted appropriate monitoring and control systems to ensure adequate co-ordination and control of projects.	7	10	34	25	6	3.41
KPLC has quality control systems to ensure achievement of customer satisfaction.	9	14	21	34	4	3.46
Average	**9.25**	**10**	**19**	**35.75**	**8**	**3.62**

Results of the responses shown in Table 4.7 indicate that 54 (65.85%) respondents agreed that the organization had systems in place for effectively managing project scope, budget and schedule, 52 (63.41%) respondents agreed that the organization instituted systems to effectively manage resources allocated to projects, 31 (37.80%) respondents agreed that the organization

had instituted appropriate monitoring and control systems to ensure adequate co-ordination and control of projects and 38 (46.34%) agreed that the organization had quality control systems to ensure achievement of customer satisfaction. The mean score for the responses was 3.62. The results imply that majority of the respondents agreed to the statements regarding performance of distribution projects on aspects of managing project scope, budget and schedule and ensuring resources allocated to projects are managed effectively. However, on the aspect of monitoring and control systems and quality control, the respondents disagreed with the statements. This implies that despite provision of adequate resources, the organization systems deliver project outcomes that have deficiencies in quality, with the probable cause been lack of co-ordination and control of project.

4.4.2 Economic Risk and Project Performance

The first objective of the study was to determine the influence of economic risk on the performance of distribution projects in Nairobi County.

Table 4.8 Economic Risk Factors.

Economic Risk Factors	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Likert Mean
KPLC has systems that will make it the preferred choice by Kenyans for electricity supply in a competitive environment.	3	18	30	24	7	3.22
KPLC has systems to ensure financial viability of projects prior to commencement.	6	13	18	35	10	3.52
KPLC funding is adequate for approved projects	3	19	15	32	13	3.44
KPLC has adequate monitoring and reporting systems to ensure proper usage of budgeted project funds.	4	9	22	41	6	4.07
Average	**4**	**14.75**	**21.25**	**33**	**9**	**3.56**

Table 4.8 shows that 31 (37.81%) respondents agreed that KPLC had systems that made it the preferred choice of electricity supply in a competitive environment, 45 (54.88%) respondents agreed that KPLC had systems to ensure financial viability of projects prior to commencement, 45 (54.88%) respondents agreed that KPLC funding is adequate for approved projects, 47 (57.32%) agreed KPLC has adequate monitoring and reporting systems to ensure proper usage of budgeted project funds. Overall, 42 (51.22%) respondents, agreed that management of economic risk had an effect on project performance. The average mean of 3.56 confirms that slightly over half of the respondents were in agreement that the organization gave priority to ensuring that there was adequate financing from internal and external resources. The results imply that on the overall, KPLC is managing economic risks reasonably well. However, the respondents expressed disagreement with KPLC been the preferred supplier of electricity in a competitive environment

4.4.3 Completion Risk and Project Performance

The second objective of the study was to determine the influence of completion risk on the performance of distribution projects in Nairobi County. The results of the finds are shown in Table 4.9.

Table 4.9 Completion Risk

Completion Risk Factors	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean
KPLC has systems which ensure projects are technically viable.	3	6	9	58	6	3.76
KPLC has systems which check and control preparation of project estimates.	12	4	18	38	10	3.80
KPLC Procurement systems adequately address material requirements for projects.	5	24	19	30	4	3.11
KPLC has systems to effectively handle disputes in projects	10	15	24	32	1	3.35
KPLC has effective supervisory capacity to ensure smooth implementation and completion of projects.	9	19	15	30	9	3.44
KPLC has systems to ensure Contractors engaged to implement projects have effective capacity to implement projects to completion.	7	21	21	24	9	3.11
Overall Index	**7.67**	**14.83**	**17.67**	**35.33**	**6.5**	**3.43**

Table 4.9 indicates that 64 (78.49%) respondents agreed that KPLC had systems which ensured projects were technically viable, 48 (58.54%) respondents agreed that there were systems in place which checked and controlled preparation of project estimates, 34 (41.46%) respondents

agreed that procurement systems adequately addressed material requirements for projects, 33 (40.24%) respondents agreed that KPLC had systems to effectively handle disputes in projects, 39 (47.56%) respondents agreed that there was enough supervisory capacity to ensure smooth implementation and completion of projects and 33 (40.24%) respondents agreed that there were systems to ensure contractors engaged to implement projects had effective capacity to implement projects to completion. The average mean obtained was 3.43. The results imply that KPLC has adequate systems for establishing technical viability, checking and controlling development of project estimates. However, on the aspect of supervisory capacity, engagement of qualified contractors and handling of disputes, the respondents disagreed with the statements and this implies that KPLC systems are weak in management of completion risks on the aspects of supervision, engagement of qualified contractors and disputes handling.

4.4.4 Regulatory Risk and Project Performance

The third objective of the study was to establish the extent to which regulatory risk influenced the performance of KPLC distribution projects in Nairobi County. The results are shown in Table 4.10.

Table 4.10 Regulatory Risk

Regulatory Risk Factors	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean
KPLC has systems which ensure regulatory approvals for projects are obtained in a timely manner.	11	12	15	35	9	3.62
KPLC has systems which ensure compliance to existing regulations and laws when planning and implementing projects.	10	3	26	33	10	3.74
KPLC has effective Safety, Health and Environment systems to ensure safe working place for staff and public safety.	3	3	4	48	24	4.11
Overall Index	**8**	**6**	**15**	**38.67**	**14.33**	**3.82**

Results indicated that 44 (53.66%) respondents agreed that there were systems which ensured regulatory approvals for projects were obtained in a timely manner, 43 (52.44%) respondents

agreed that there were systems which ensured compliance to existing regulations and statutes during planning and implementing of projects while 72 (87.81%) respondents agreed that there were adequate systems to ensure a safe, healthy and clean environment for staff. The mean obtained was 3.82. This implies that the respondents were in strong agreement that management of regulatory risk within the organization was effective and this ensured improved project performance.

4.4.5 Technological Risk and Project Performance

The fourth objective of the study was to establish the influence of technological risk on the performance of distribution projects in Nairobi County. The results are shown in Table 4.11.

Table 4.11 Technological Risk

Technological Risk Factors	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean
KPLC has adequate tools and equipment to enable effective use of technology in project implementation.	3	12	17	43	7	3.53
KPLC encourages innovation of new methods in implementation of projects.	9	9	29	29	6	3.49
KPLC has systems which ensure it has trained personnel to handle technological changes.	12	14	9	41	6	3.62
Overall Index	**8**	**11.67**	**18.33**	**37.67**	**6.33**	**3.55**

Results from the study, indicate that 50 (60.98%) respondents agreed that there are adequate tools and equipment to enable effective use of technology in project implementation, 35 (42.68%) respondents agreed that KPLC encourages innovation of new methods in implementation of projects and 47 (57.32%) respondents agreed that there are systems which ensure it has trained personnel to handle technological changes. Overall, 44 (53.66%)

respondents agreed that organizational systems for managing technological risk improves project performance. This is further supported by a mean of 3.55. The results imply that the respondents were in strong agreement that management of technological risk within the organization, on the aspects of adequacy of tools and equipment and availability of trained personnel to handle technological challenges was effective. However, in terms of encouraging innovation of new methods, the respondents did not identify the organization systems as providing a conducive environment for developing innovative processes towards improved performance of projects.

4.5 Inferential Statistics Analysis

This section presented the correlation and regression analysis.

4.5.1 Bivariate Correlation

Table 4.12 displays the results of correlation test analysis between the dependent variable, the independent variables and the correlation among the independent variables themselves.

Table 4.12 Bivariate Correlation

Variable		Project Performance	Economic Risk	Completion Risk	Regulatory Risk	Technological Risk
Project Performance	Pearson Correlation	1				
	Sig. (2-tailed)					
Economic Risk	Pearson Correlation	0.178	1			
	Sig. (2-tailed)	0.109				
Completion Risk	Pearson Correlation	0.472	0.303	1		
	Sig. (2-tailed)	0.000	0.006			
Regulatory Risk	Pearson Correlation	0.206	0.213	0.610	1	
	Sig. (2-tailed)	0.063	0.055	0.000		
Technological Risk	Pearson Correlation	0.396	0.207	0.516	0.469	1
	Sig. (2-tailed)	0.000	0.062	0.000	0.000	

Results on Table 4.12 indicate that a positive correlation exists between the dependent variable-project performance- and the independent variables - Economic risk, Completion risk, Regulatory risk and Technological Risk. The bivariate Pearson Correlation produces a sample correlation coefficient, r, which measures the strength and direction of linear relationships between pairs of continuous variables. The positive correlation coefficients (r) imply that a positive change in management of economic, completion, regulatory and technological risks will lead to an improvement in performance of projects. Correlation, in this study is considered, significant if the significance is less than 0.01, for a 2-tailed test. The implication of the results indicates that completion and technological risks have a stronger correlation to project performance when compared with economic and regulatory risks. In addition, the results imply that there is a strong correlation between completion risk on one hand and regulatory and technological risks on the other.

4.5.2 Regression Analysis

In order to establish the statistical significance of the independent variables on the dependent variable-project performance-regression analysis was employed. The regression equation took the following form: -

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu$$

Where;

Y =Project Performance

X_1 = Economic Risk

X_2 = Completion Risk

X_3 = Regulatory Risk

X_4 = Technological Risk

In the model, β_0 is the constant term while the coefficient β_i where i = 1….4 was used to measure the sensitivity of the dependent variable (Y) to unit change in the predictor variables.

μ is the error term which captures the unexplained variations in the model.

To determine the coefficients and constant term, SPSS was used to compute the terms and the results are shown in Table 4.13.

Table 4.133 Regression Coefficients

Variable	B (Unstandardized Coefficient)	Standard Error	t	Significance (p)
Constant	7.681	1.717	4.474	0.000
Economic Risk	0.019	0.063	0.306	0.760
Completion Risk	0.313	0.091	3.429	0.001
Regulatory Risk	0.253	0.166	1.526	0.131
Technological Risk	0.282	0.134	2.113	0.038

The overall model as shown in Table 4.13 indicated that completion risk and technological risk were highly significant at p=0.001 and p=0.038 respectively. However economic risk and regulatory risk were significant at p=0.760 and p=0.131. The fitted model was:

$$Y = 7.681 + 0.019X_1 + 0.313X_2 + 0.253X_3 + 0.282X_4$$

Table 4.13 displays the regression coefficients of the independent variables. The results reveal that economic risk is statistically significant in explaining project performance (beta=0.019, p value 0.760). The findings imply that an increase in management of economic risks by one unit leads to an increased project performance effectiveness by 0.019 units. Regression results indicate that management of completion risks and project performance had a positive and significant relationship (beta=0.313, p value 0.001). The findings imply that an increase in management of completion risks by one unit leads to an increase in project performance effectiveness by 0.313 units. Results further indicate that management of regulatory risk and project performance had a positive and significant relationship (beta= 0.253, p value 0.131). The findings imply that an increase in management of regulatory risks by one unit leads to an increase in project performance by 0.253 units. Finally, the results indicated that management of technological risk and project performance (beta=0.282, p value 0.038) had a positive and significant relationship. The findings imply that an increase in management of technological risk by one unit leads to an increase in project performance by 0.282 units.

4.5.3 Regression Model Fitness

The results of the regression model obtained from SPSS calculations are shown in Table 4.14.

Table 4.144 Regression Model Fitness

Indicator	Coefficient
R	0.526
R Square	0.277
Standard. Error of the Estimate	2.189

Table 4.14 shows that the coefficient of determination, also called the R square, is 0.277. This means that the combined effect of the predictor variables-economic risks, completion risks, regulatory risks and technological risks- explains 27.7% of the variations in project performance. The correlation coefficient of 0.526 indicates that the combined effect of the predictor variables has a strong and positive correlation with project performance. This confirms that a positive change of the predictor variables- economic risks, completion risks, regulatory risks and technological risks- has a strong and a positive effect on performance of distribution projects.

4.5.4 Analysis of Variance

An Analysis of Variance (ANOVA) was computed, using SPSS, to determine the combined effect of the management of economic, completion, regulatory and technological risks in explaining significant changes in performance of distribution projects. The results are shown in Table 4.15.

Table 4.155 Analysis of Variance (ANOVA), F-Test

Indicator	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance
Regression	141.340	4	35.335	7.374	0.000
Residual	368.965	77	4.792		
Total	**510.305**	**81**			

The results show that the combined effect of management of economic, completion, regulatory and technological risks was statistically significant in explaining changes in performance of distribution projects. The results indicate that the model fit is significant at a p value of 0.000, which is less than the acceptance critical value of 0.05 for this study, at 81 degrees of freedom. This implies that management of economic risk, completion risk, regulatory risk and technological risk have significant and positive combined effect on performance of distribution projects.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS, DISCUSSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter finalizes the study by providing the summary of key findings, discussions, conclusions and recommendations. The summary, discussions, conclusions and recommendations are aligned to the specific objectives of the study.

5.2 Summary of Findings

5.2.1 Project Performance

One of the key findings was that KPLC employees involved in implementation of distribution projects within Nairobi County were concerned about the performance of the projects. Their concerns demonstrated their determination to ensure the projects fulfilled organization goals and objectives. This was demonstrated by the extent of agreement with the statements in the questionnaire in support of adequate provision of resources towards ensuring improved project performance. However, the respondents expressed negative sentiments towards the ability of the organization's systems to monitor and control utilization of resources and general project progress coupled with the quality control of project outcomes.

5.2.2 Economic Risk and Project Performance

The first objective of the study was to establish the influence of economic risk on the performance of distribution projects by KPLC in Nairobi County. Results indicated that an average of 42 (51.22%) respondents agreed that existing organizational systems managed economic risks well and this influenced project performance positively. Furthermore, 45 (54.88%) respondents agreed that KPLC funding for projects was adequate. The findings were also supported by the correlation coefficient and regression results which indicated that there was

a positive and significant relationship between project performance and management of economic risk factors (r = 0.178, beta=0.019, p value 0.760).

5.2.3 Completion Risk and Project Performance

The second objective of the study was to determine the influence of completion risk on the performance of distribution projects by KPLC in Nairobi County. The study findings indicated that completion risks influenced project performance. Results indicated that an average of 42 (51.01%) respondents agreed that management of completion risk influenced project performance positively. The results further confirmed that 34 (41.46%) respondents agreed that procurement systems were adequate and 39 (47.56%) respondents believed that the supervisory capacities of KPLC staff were adequate. Correlation coefficient and regression results indicated that there was a positive and significant relationship between project performance and management of completion risk factors (r =0.472, beta=0.313, p value = 0.001).

5.2.4 Regulatory Risk and Project Performance

The third objective of the study was to establish the influence of regulatory risk on the performance of distribution projects by KPLC in Nairobi County. The findings indicated that management of regulatory risks influenced project performance positively. This was supported by the overwhelming responses from the respondents- an average of 53 (64.63%) respondents - who agreed that the existing organizational systems for managing regulatory risks had a positive influence on performance of distribution projects.44 (53.66%) respondents agreed that existing systems ensured compliance to existing regulations and laws when planning and implementing projects Correlation coefficient and regression results indicated that there was a positive and significant relationship between project performance and management of regulatory risk factors (r = 0.206, beta= 0.253, p value 0.131).

5.2.5 Technological Risk and Project Performance

The fourth and last objective of the study was to establish the influence of technological risk on the performance of distribution projects in Nairobi County. Results revealed that 50 (60.98%) respondents agreed KPLC had adequate tools and equipment to enable effective use of technology in project implementation, 35 (42.68%) respondents agreed that the organization encouraged innovation of new methods in implementation of projects and 47 (57.43%) respondents agreed that the existing systems ensured availability of trained personnel to handle

technological changes. Correlation coefficient and regression results indicated that there was a positive and significant relationship between project performance and management of technological risk factors (r = 0.396, beta= 0.282, p value 0.038).

5.3 Discussions

The purpose of the discussion is to interpret and describe the significance of the study findings in light of what is already known about the research problem being investigated, and to explain any new understanding or fresh insights about the problem taking the findings into consideration.

5.3.1 Project Performance

The findings imply that in spite of KPLC instituting systems to efficiently managing project scope, budget and schedule as well as to effectively manage resources allocated to projects. The organization systems are experiencing challenges monitoring and controlling effectively project progress and quality control KPLC needs to improve the organizational processes and systems in aspects of monitoring and control of project performance and quality control of projects inputs and deliverables during project implementation. In other words, KPLC needs to embrace fully modern project management techniques, including risk management, (Hurley, 2010). Cheruiyot (2013) in his study on the influence of enterprise risk management on strategic management process at KPLC noted that employees are the ones who eventually implement the organization's risk management policy and therefore it was necessary their involvement is sought towards ensuring risk management systems are implemented successfully. Failure to institute effective systems for quality control and monitoring and control during project implementation increases the likelihood that types of risks may arise, preventing delivery of project goals and quality of deliverables. Margules, (2013) posited that excellent project risk management enables a project better probability of staying on track, project team members to be empowered in their decision making ability and eventually being successful and have an impact on customer satisfaction.

5.3.2 Economic Risk and Project Performance

The results from the study indicate that KPLC has established systems to ensure financial viability, through adequate funding as well as having an adequate monitoring and reporting systems to ensure proper usage of budgeted project funds. The results further confirm findings by Kamwana and Muturi (2014) who noted that KPLC was able to attract external funding from

multilateral donors for financing distribution projects. However, the results have established that should there be a competitor in the electricity retail market KPLC risks losing customers to potential competitors. This would affect its revenue base and subsequently its ability to fund projects. An open, vibrant electricity retail market would therefore impinge on the organization's revenue base and affect its ability to raise funds internally and borrow from without to fund distribution projects. Finnerty, (2013) posited that economic viability of a project will primarily depend on the marketability of the project's output, terms of price and volume and cost of maintenance of the project facility This places an onus on KPLC to ensure that electricity sales to its customers within Nairobi County grows while offering the service at competitive prices and at minimal cost on maintenance of the distribution facilities established within the County. A similar conclusion can be drawn for the rest of the country where KPLC operates a similar line of business.

5.3.3 Completion Risk and Project Performance

The study findings confirmed that management of technical planning and design processes for distribution projects within KPLC ensured that completion risks arising from poor planning and design were mitigated. This concurs with Finnerty (2013) who stated the importance of proper planning of technical planning, design and implementation of a project. Management of completion risk requires that KPLC invests in a capable and able human resource base by recruiting qualified personnel and ensuring they are adequately trained. This is corroborated by findings in a study conducted by Amboka and Ssemugenyi (2014) on influence of human resources management practices on employee retention in KPLC. However, in respect to procurement systems, the findings implied that organizational systems for handling procurement of materials were weak. This is corroborated by Oginda (2013) who in his study on the procurement function at KPLC stated that existing procurement systems had several handicaps which prevented adequate procurement of materials. The handicaps included: lack of trained procurement staff to schedule timely procurement of materials, corruption among procurement officers and suppliers, procurement of sub-standard quality of materials and poor co-ordination between procurement officers and the project team leaders responsible for planning and implementing distribution projects to effectively handle disputes in projects. In regard to systems for handling dispute resolution, the findings indicated that respondents did not have confidence in dispute resolution mechanisms, especially between KPLC and the contractors' it engaged to

implement the projects. Furthermore, the findings reflected weaknesses in the technical processes employed during project execution, including under-estimation of construction costs and eventual disputes with contractors (Finnerty, 2013). This is further exacerbated by the poor dispute resolutions mechanisms between KPLC and contractors. This study finding are corroborated by Kowuor (2012) who noted that KPLC was experiencing challenges in supervision of contractors furthermore competency levels of several contractors was wanting. There is therefore need for KPLC to improve its systems for handling project contracts and disputes arising from administration of the contracts. In addition, the supervisory capabilities of KPLC personnel supervising internal and external contractors need to be improved through additional technical and management training (Odeh and Battaneih, 2002).

5.3.4 Regulatory Risk and Project Performance

The study findings confirmed that KPLC has a good track record in management of regulatory risk. In order for KPLC to successfully undertake distribution projects it is imperative that the organization manages regulatory risks. This concurs with statements by Eveld, (1981) who noted that failure to comply to regulatory requirements could mean the difference between a viable project and one which is not implementable This is further confirmed by Turner, (2007), who stated that the project team needed to have a clear vision to present to stakeholders, understand the project objectives and align them with stakeholders' values and monitor how project decisions directly affect stakeholder value. The study findings confirmed that KPLC has adequate systems, which promote and ensure adherence to regulations concerning safety and health. This concurs with Bonyuet (2001) who stated that a good safety plan increases the potential for project success and the confidence of team members. Nzuki (2011) stated that running a utility organization such as KPLC, should be in a manner that not only ensured but also enhanced the safety and health of the workers, visitors, customers, the public and the environment in line with the relevant government legislation, regulation and international best practices.

5.3.5 Technological Risk and Project Performance

The results of the study imply that KPLC has endeavoured to ensure provision of tools and equipment to its personnel as part of measures necessary for successful application of technology in performance of projects. This concurs with recommendations of Macharia and Ngugi (2014) who stated that integration of information technology in the implementation of projects had a

positive influence on successful completion of projects. This study finding and earlier findings are confirmed by the organization's provision of modern computer firmware, including computers, computer aided design and accounting software, to enhance quality of service to internal and external customers and achieve project goals. A similar implication can be drawn in respect to provision of modern tools and equipment by the organization to ensure efficient, effective and safer methods are employed in project implementation processes such as construction and maintenance of distribution substations and lines. However, on the aspect of encouraging innovation of new methods in implementation of projects the study findings indicated a need for KPLC to improve on the capability of its staff, through in-house and external training, on technical and non-technical aspects of project planning, financing and implementation. The training should enable project teams to be innovative in developing efficient and effective processes with a view of improving project performance. This finding is corroborated by Amboka and Ssemugenyi (2014) who noted that training focused on quality and quantity of work improves the productivity of staff. Organizational systems should encourage project team staff to device innovative methods in managing technological risk within distribution projects. This finding is further confirmed by Wekesa (2012), in his study on managing technological change in KPLC, where he stated that communication and continuous training was necessary towards creating capacity for successful implementation of technological change.

5.4 Conclusions of the Study

The main purpose of the study was to investigate the influence of four specific types of risks to performance of distribution projects within Nairobi County. The types of risks considered in the study were economic, completion, regulatory and technological risks. In terms of the stated research objectives, the following conclusions can be drawn from the study: -

5.4.1 Project Performance

The study confirmed that economic, completion, regulatory and technological risks have a significant influence on the performance of distribution projects within Nairobi County. The study further confirmed that there are deficiencies in the organizational processes and systems in aspects dealing with monitoring and control of project performance and quality control of projects inputs and deliverables.

5.4.2 Economic Risk and Project Performance

The study confirmed that KPLC has adequate systems to ensure financial viability of projects, adequate funding for projects and a robust monitoring and reporting system of project funds. However, in the event of a liberalized market in the retail power distribution in the county, KPLC would lose market share for its services and this would impinge on the organization's ability to raise funds, generated internally or borrowed, to finance projects.

5.4.3 Completion Risk and Project Performance

The study confirmed that KPLC, organizational systems were adequate in ensuring projects were technically viable However, challenges exist in procurement systems and supervisory capabilities of staff supervising implementation of distribution projects in Nairobi County.

5.4.4 Regulatory Risk and Project Performance

The study confirmed that KPLC has adequate systems which ensure regulatory approvals for projects are obtained in a timely manner. The study further confirmed that the organization gives high priority to issues of acquisition of necessary approvals and regulatory requirements prior to implementing a project. This reflects the degree of involvement between the organization and relevant stakeholders when it seeks to implement distribution projects.

5.4.5 Technological Risk and Project Performance

The study confirmed KPLC has managed aspects of technological risks, through provision of tools and equipment to enable effective use of technology in projects. However, KPLC management needs to develop and nurture innovation among its staff engaged in implementation of projects. In addition, KPLC should endeavour to continuously train its project team personnel in the latest technologies and processes of developing, planning, financing and implementing projects. The benefits will be greater project performance and successes.

5.5 Recommendations of the Study

Given the findings and conclusions, the study recommends the following measures for implementation to address the factors affecting the performance of distribution projects by KPLC within Nairobi County: -

5.5.1 Project Performance

KPLC needs to improve the organizational processes and systems in aspects of monitoring and control of project performance and quality control of projects inputs and deliverables during project implementation. This will ensure adequate co-ordination and control of projects. Proper monitoring and control systems will enable the organization to identify challenges before-hand and also document previous challenges thereby institutionalizing knowledge management and create the ability to resolve similar challenges in future. In other words, KPLC needs to embrace fully modern project management techniques, including risk management.

5.5.2 Economic Risks and Project Performance

KPLC needs to continually improve on its internal mechanism towards maintaining good relationship with its customers for sustained future growth in revenue base. This will ensure availability of revenue to sustain increasing demands for funding expansion of the distribution network in Nairobi County. A similar conclusion can be inferred for the organization's business operations in the rest of the country.

5.5.3 Completion Risk and Project Performance

KPLC management needs to improve the organizational procurement systems to ensure it is responsive to users and able to forecast needs and requirements in a timely and responsive manner. Furthermore, training of KPLC staff in management of contracts and contractors is necessary to address challenges in supervision of contractors, project scope and disputes as part of efforts towards mitigating completion risks. It is imperative KPLC engages contractors who have the necessary capacity to implement projects to completion. This will eliminate delays while ensuring that projects are done under minimum supervision but with the best results.

5.5.4 Regulatory Risk and Project Performance

There is no doubt KPLC has responded well to the challenges of managing regulatory risk through a proactive manner such as establishing a department to address safety, health and environment issues. In addition, policies have been institutionalized to ensure full compliance to

regulatory requirements necessary to achieve successful performance of distribution projects. However, given the dynamic nature and demands by various stakeholders-including the government, the public, customers and the energy regulator ERC-KPLC should ensure it maintains vigilance through: studying, understanding and adhering to, the laws and regulations applicable to distribution projects, including conditions precedent to approval of a project and possibility of legal litigation. KPLC should establish internal mechanisms to ensure early and regular contacts with representatives of the appropriate agencies including county governments, the public and their political and social representatives to ensure any objections are responded to promptly and appropriately. This vigilance should apply to aspects of safety and health during implementation of distribution projects.

5.5.5 Technological Risk and Project Performance

The study noted that KPLC needed to appreciate and improve on the capability of its staff towards learning, developing and applying new and innovative methods of implementing distribution projects. This should be considered as a part of managing technological risk and improving project performance. The training can be achieved through in-house training and use of external consultants and trainers. There is need for KPLC to encourage innovation, among its project team members, of new methods in implementation of projects. This needs to be emphasized by projects managers and their subordinates. Innovation has a variety of benefits, including achieving project performance and completion in a cost effective manner, completion of projects ahead of schedule and saving on materials among others. The recent establishment of the Institute of Energy Studies and Research is a step the organization has taken towards the improving the knowledge base of the organization through research and innovation.

5.6 Suggestions for Further Studies

This study having researched on the influence of types of risks on the performance of distribution projects, by KPLC, in Nairobi County suggests further studies on the following two phenomena:

i. Influence of Organizational Culture and Styles on Quality of Distribution Project Risk Management within Nairobi County.
ii. How management of Project Requirements Influences Performance of Distribution Projects by KPLC within Nairobi County?

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APPENDICES

APPENDIX I LETTER OF TRANSMITTAL

LETTER OF TRANSMITTAL

Dear Respondent,

RE: REQUEST FOR QUESTIONNAIRE ADMINISTRATION

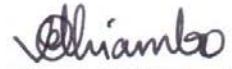
I am a Final Year Master of Arts student in Project Planning and Management at the School of Continuing and Distance Education, University of Nairobi. As part of the requirements for the course, I am undertaking a study on: ***"The Influence of Types of Risk on Performance of Electricity Distribution Projects: A Case of Kenya Power and Lighting Company in Nairobi County".***

You have been identified to participate in the ongoing research study. The burden of the questionnaire will take no more than twenty (20) minutes and will be incorporated within your routine; your participation is purely voluntary. If you choose to participate, please give as accurate and honest answers as possible.

As a confidentiality measure, your name will not be required and the information you provide will be treated with utmost confidentiality and used for purely academic purposes. A copy of this letter of request for questionnaire administration together with an approval from your employer permitting this research will be given to you as part of the questionnaire package.

Thank you in advance for your support.

Yours faithfully,



Vincent Odhiambo Ouma

+254724144981

Student-University of Nairobi

Kenya Power

The Kenya Power & Lighting Co. Ltd.
Central Office - P.O. Box 30099 Nairobi, Kenya.
Telephone - 254-20-3201000 - Telegrams 'ELECTRIC'
Fax No. 254-20-3514485
STIMA PLAZA, KOLOBOT ROAD

Our Ref:

Your Ref:

KP1/5BA/42D/JWK/ls

24th February 2016

TO WHOM IT MAY CONCERN

RESEARCH APPROVAL – VINCENT OUMA ODHIAMBO

Reference is made to the subject matter mentioned above.

Kindly allow the above student at University of Nairobi to carry out a research project in the Company on ***"Influence of Types of Risks on Performance of Distribution Projects: Case Study of Kenya Power in Nairobi County".***

This authority notwithstanding, discretion must be exercised in the use of company information including business strategies and policy documents.

The Research Project should also not disrupt normal working hours and Company's flow of work.

A soft copy of the final Research Project saved in a Compact Disc should be forwarded to the Learning & Development Department.

Yours faithfully,
For: KENYA POWER & LIGHTING CO. LTD.

JOYCE W. KOSKEY (MRS.)
FOR: MANAGER, LEARNING & DEVELOPMENT

APPENDIX II QUESTIONNAIRE FOR EMPLOYEES OF KPLC

The purpose of this questionnaire is to collect information pertaining to how certain types of risk influences performance of electricity distribution projects within Nairobi County. Information collected will be treated with utmost confidentiality and will be used only in this study.

Instructions

Complete this questionnaire as honestly as possible by ticking in the appropriate box. Do not write your name on the questionnaire.

SECTION 1

GENERAL INFORMATION

1) Indicate your Gender. [ ] Male [ ] Female
2) How long have you been employed with KPLC?
    a. Less than 1 year [ ]
    b. 2 to 5 years [ ]
    c. 6 to 10 years [ ]
    d. Over 10 years [ ]
3) What is your highest level of education?
    a. Postgraduate [ ]
    b. Undergraduate [ ]
    c. Diploma [ ]
    d. Other [ ]
4) What is your position in the organization?
    a. Top Management [ ]
    b. Middle Management [ ]
    c. Supervisory Level [ ]
    d. Union [ ]
5) Please indicate which department you work in.
    a. Planning and Design [ ]
    b. Finance [ ]
    c. Procurement and Logistics [ ]
    d. Property [ ]
    e. Risk and Legal [ ]

f. Insurance [ ]
g. Safety, Health and Environment [ ]
h. Projects and Construction [ ]
i. Wayleaves and Survey [ ]
j. Customer Service and Marketing [ ]

SECTION 2

RISK FACTORS AND PROJECT PERFORMANCE

PART A: Project Performance

This part is concerned with assessing the performance of distribution projects at KPLC within Nairobi County. Please mark (x) in the box which best describes your agreement or disagreement to each of the following statements.

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
KPLC has systems in place for efficiently managing project scope, budget and schedule					
KPLC has instituted systems to effectively manage resources allocated to projects.					
KPLC has instituted appropriate monitoring and control systems to ensure adequate co-ordination and control of projects.					
KPLC has quality control systems to ensure achievement of customer satisfaction					

PART B: Economic Risk factors and Project Performance

This part is concerned with assessing influence of economic risk on the performance of distribution projects at KPLC within Nairobi County. Please mark (x) in the box which best describes your agreement or disagreement to each of the following statements.

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
KPLC has systems that will make it the preferred choice, by Kenyans, for electricity supply in a competitive environment.					
KPLC has systems to ensure financial viability of projects prior to commencement.					
KPLC funding is adequate for approved projects.					
KPLC has adequate monitoring and reporting systems to ensure proper usage of budgeted project funds.					

PART C: Completion Risk factors and Project Performance

This part is concerned with assessing influence of completion risk on the performance of distribution projects at KPLC within Nairobi County. Please mark (x) in the box which best describes your agreement or disagreement to each of the following statements.

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
KPLC has systems which ensure projects are technically viable.					
KPLC has systems which check and control preparation of project estimates.					
KPLC procurement systems adequately address material requirements for projects.					
KPLC has systems to effectively handle disputes in projects.					
KPLC has effective project supervisory capacity to ensure smooth implementation and completion of projects.					
KPLC has systems to ensure Contractors engaged to implement projects have effective capacity to implement projects to completion.					

PART D: Regulatory Risk factors and Project Performance

This part is concerned with assessing influence of regulatory risk on the performance of distribution projects at KPLC within Nairobi County. Please mark (x) in the box which best describes your agreement or disagreement to each of the following statements.

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
KPLC has systems which ensure regulatory approvals for projects are obtained in a timely manner.					
KPLC has systems which ensure compliance to existing regulations and laws when planning and implementing projects					
KPLC has effective Safety, Health and Environment systems to ensure safe working place for staff and public safety.					

PART E: Technological Risk and Project Performance

This part is concerned with assessing influence of technological risk on the performance of distribution projects at KPLC within Nairobi County. Please mark (x) in the box which best describes your agreement or disagreement to each of the following statements.

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
KPLC has adequate tools and equipment to enable effective use of technology in project implementation.					
KPLC encourages innovation of new methods in implementation of projects.					
KPLC has systems which ensure it has trained personnel to handle technological changes.					

THANK YOU FOR YOUR PARTICIPATION

APPENDIX III UNIVERSITY OF NAIROBI INTRODUCTION LETTER

UNIVERSITY OF NAIROBI
COLLEGE OF EDUCATION AND EXTERNAL STUDIES
SCHOOL OF CONTINUING AND DISTANCE EDUCATION
DEPARTMENT OF EXTRA-MURAL STUDIES
NAIROBI EXTRA-MURAL CENTRE

Your Ref:

Our Ref:

Telephone: 318262 Ext. 120

Main Campus
Gandhi Wing, Ground Floor
P.O. Box 30197
N A I R O B I

16th February 2016

REF: UON/CEES//NEMC/22/725

TO WHOM IT MAY CONCERN

RE: VINCENT ODHIAMBO OUMA - REG.NO.L50/71989/2014

This is to confirm that the above named is a student at the University of Nairobi, College of Education and External Studies, School of Continuing and Distance Education, Department of Extra- Mural Studies pursuing Master of Arts in Project Planning and Management.

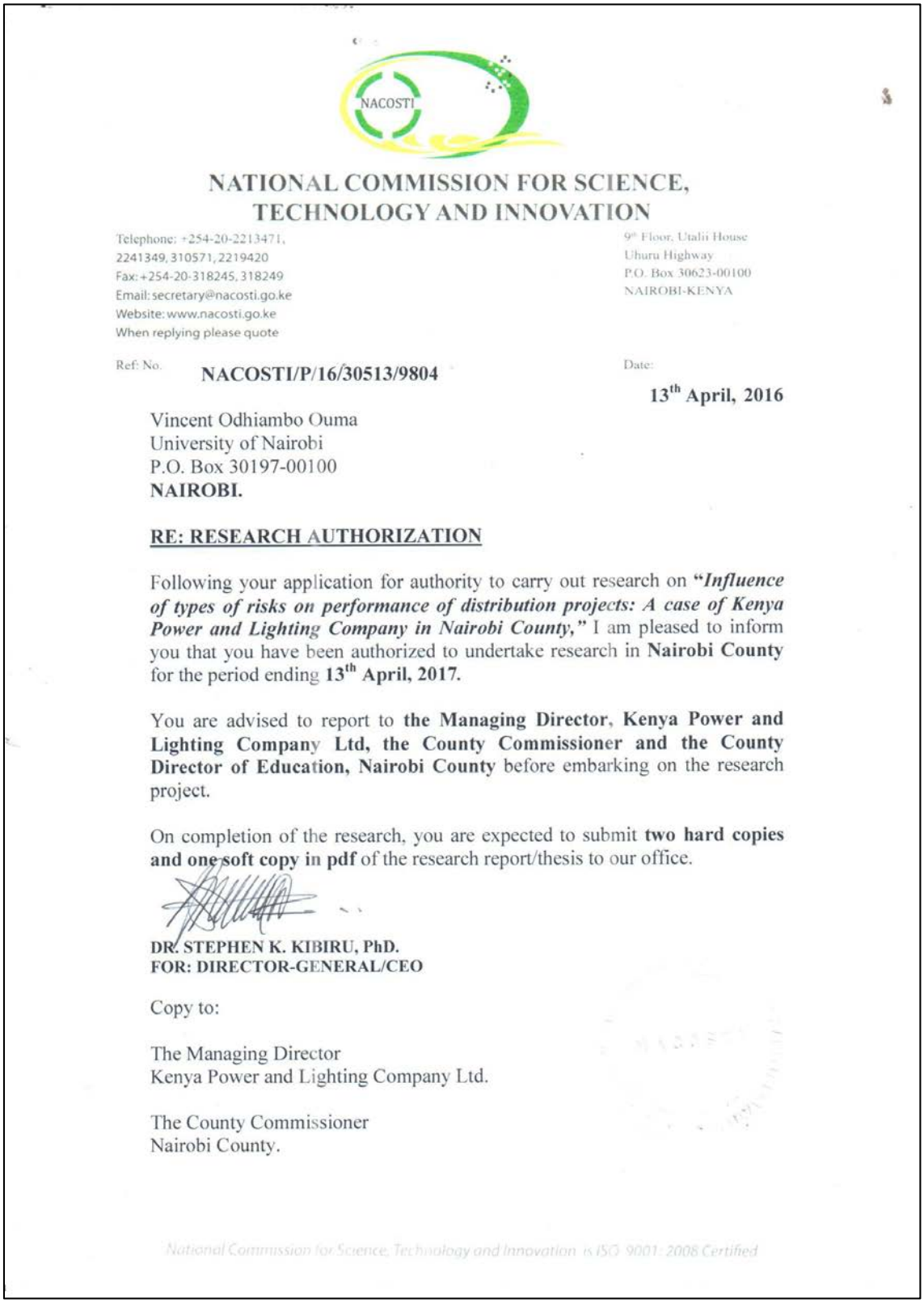
He is proceeding for research entitled **"influence of types of risks on performance of distribution projects"** A case of Kenya power and lighting company in Nairobi County.

Any assistance given to him will be appreciated.

UNIVERSITY OF NAIROBI CEES
P.O. Box 30197
16 FEB 2016
NAIROBI
NAIROBI EXTRA MURAL CENTRE

CAREN AWILLY
CENTRE ORGANIZER
NAIROBI EXTRA MURAL CENTRE

APPENDIX IV RESEARCH PERMIT- NACOSTI



NACOSTI

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

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Email: secretary@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/16/30513/9804**

Date: **13th April, 2016**

Vincent Odhiambo Ouma
University of Nairobi
P.O. Box 30197-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Influence of types of risks on performance of distribution projects: A case of Kenya Power and Lighting Company in Nairobi County,"*** I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for the period ending **13th April, 2017.**

You are advised to report to **the Managing Director, Kenya Power and Lighting Company Ltd, the County Commissioner and the County Director of Education, Nairobi County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

DR. STEPHEN K. KIBIRU, PhD.
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The Managing Director
Kenya Power and Lighting Company Ltd.

The County Commissioner
Nairobi County.

National Commission for Science, Technology and Innovation is ISO 9001: 2008 Certified