

**RISK MANAGEMENT STRATEGIES AND PERFORMANCE OF CONSTRUCTION
PROJECTS IN PUBLIC SECONDARY SCHOOLS IN MURANG'A COUNTY, KENYA**

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DECLARATION

I declare that this research project is my original work and has not been submitted to any other institution for examination or any other award. No part of this research project should be reproduced without the authority of the author and or Kenyatta University.

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This research project has been submitted for examination with my approval as the appointed university supervisor.

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DEDICATION

I dedicate this research project to my parents Mr. and Mrs. Kimani for their encouragement and great support they have given me to undertake this study.

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Firstly, I would like to take this opportunity to the Almighty Lord granting me perseverance, strength, and protection to come this far. Secondly, I would like to acknowledge my supervisor Dr. Kirui Caleb for his invaluable support, guidance, availability, and direction during this research project generation. I also appreciate my family for their financial support and encouragement during my studies. Finally, I salute my very reliable friend Mr. Njuguna who is a role model and a source of inspiration to my life.

TABLE OF CONTENTS

DECLARATION.....	ii
DEDICATION.....	iii
ACKNOWLEDGEMENT.....	iv
TABLE OF CONTENTS	v
LIST OF TABLES.....	viii
LIST OF FIGURES	ix
ABBREVIATIONS AND ACRONYMS.....	x
OPERATION DEFINITION OF TERMS.....	xi
ABSTRACT.....	xii
CHAPTER ONE: INTRODUCTION.....	1
1.1 Background to the study.....	1
1.1.1 Risk Management Strategies.....	3
1.2 Statement of the Problem.....	4
1.3 Objectives of the study.....	5
1.3.1 General Objectives.....	5
1.3.2 Specific Objectives.....	5
1.4 Research Questions.	6
1.5 Significance of the Study.....	6
1.6 Scope of the Study.....	7
1.7 Limitations of the study	7
1.8 Organization of the study	7
CHAPTER TWO: LITERATURE REVIEW.....	9
2.1 Introduction	9

2.2 Theoretical Review.....	9
2.2.1 Enterprise Risk Management.....	9
2.2.2 Network Theory.....	10
2.2.4 Expectancy Theory.....	11
2.3 Empirical Literature Review.....	12
2.3.1 Risk Management Strategies and Performance of Construction projects.....	13
2.3.2 Risk Avoidance Strategy and Performance of Construction Projects.....	14
2.3.3 Risk Reduction Strategy and performance of Construction projects.....	16
2.3.4 Risk Transfer Strategy and performance of Construction projects.....	18
2.3.5 Risk Retention Strategy and performance of Construction projects.....	20
2.4 Summary of Literature Review and Research Gaps.....	21
2.5 Conceptual Framework.....	23
CHAPTER THREE: RESEARCH METHODOLOGY.....	25
3.1 Introduction	25
3.2 Research Design	25
3.3 Target Population	25
3.4 Sampling Procedures and Sample Size.....	26
3.5 Data Collection Instruments.....	27
3.6 Validity and Reliability of Research Instruments.....	27
3.6.1 Validity of Research Instrument.....	28
3.6.2 Reliability of Research Instruments.....	28
3.7 Data Collection Procedures.....	28
3.8 Data Analysis and Presentation.....	29
3.9 Ethical Considerations.....	30

4.0: CHAPTER FOUR: DATA ANALYSIS RESULTS AND DISCUSSIONS.....	31
4.1 Introduction.....	31
4.2 Response Rate.....	31
4.3 Length of Time One is Holding the Current Position.....	32
4.4 Gender of Respondents.....	33
4.5 Highest Level of Education.....	34
4.6 Influence of Risk Management Strategies of Performance.....	35
4.6.1 Risk Avoidance Strategies.....	35
4.6.2 Risk Reduction Strategies.....	37
4.6.3 Risk Transfer Strategies.....	39
4.6.4 Risk Retention Strategies.....	43
4.7 Performance of Construction Projects.....	47
4.8 Opinion on whether Risk Management Improve Construction Projects.....	45
4.9 Regression Analysis	46
4.10 Correlation Analysis.....	49
5.0 CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS.....	52
5.1 Introduction.....	52
5.2 Summary of the Study.....	52
5.3 Conclusion.....	54
5.2.4 Recommendations.....	55
REFERENCES.....	56
APPENDICES.....	61
Appendix I: Introduction Letter.....	61
Appendix II: Questionnaire.....	62

LIST OF TABLES

Table 2.1: Summary of Research Gap.....	22
Table 3.1 Distribution of the Target Population.....	26
Table 3.2: Sample Size.....	27
Table 4.1 Questionnaires Return Rate.....	31
Table 4.2 Highest Level of Education.....	34
Table 4.3 Risk Avoidance Strategies.....	35
Table 4.4 Risk Reduction Strategies.....	37
Table 4.5 Risk Transfer Strategies.....	39
Table 4.6 Retention Strategies.....	41
Table 4.7 Performance of Construction Projects.....	43
Table 4.8 Regression Analysis.....	47
Table 4.9 Regression Analysis Coefficients.....	48
Table 4.10 Results of Correlation analysis.....	51

LIST OF FIGURES

Figure 2.1 Conceptual Framework.....	24
Figure 4.1 Graphical Representation on Number of Years a Position is Held.....	32
Figure 4.3 Graphical Representation on Gender of the Respondents.....	33
Figure 4.4 Graphical Representation on risk management Strategies and Project Performance...46	

ABBREVIATIONS AND ACRONYMS

BOM	Board of Management
CDF	Constituency Development Fund
ERM	Enterprise Risk Management
KENPRO	Kenya Project Organization
KESSP	Kenya Education School Support Programme
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
PTA	Parent and Teachers Association
SCEO	Sub-County Education Officer
SCQASO	Sub-County Quality Assurance Officer
SPSS	Statistical Package for Social Science
UNICEF	United Nations Children Fund

OPERATIONAL DEFINITION OF TERMS

- Performance** : This is the action or process of carrying out or accomplishing an action
- Public Secondary School** : These are the secondary schools that are funded and operated by the government.
- Project Performance** : The ability of a project to meet the requirements set at the initiation stage. These requirements include budget, duration of the project, quality, and customer satisfaction among others
- Risk** : Is the potential of threat harm, misfortune or negative event that is caused by outside or interior vulnerabilities and has an effect on them set objectives of the project
- Risk Avoidance** : Refers risk management strategy that avoids the actions that may cause certain risk. It entails changing the project to avoid the risks changing scope, objectives, etc
- Project Management** : Is a process in which an organization recognizes loss exposures affecting it and chooses the most suitable strategy for dealing with such exposures. It is a continuous procedure that continues throughout the project life
- Risk Reduction** : Refers to risk management strategy that minimizes the probability or outcome of the risk to an acceptable level. It can be done by increasing precautions or limiting the amount of risky activity.
- Risk Retention** : Refers to the handling of risk by bearing outcome or impact of risk, as opposed to utilizing different strategies for dealing with it. It happens if the cost of transferring risk is greater than the cost of retaining and paying losses.
- Risk Transfer** : Refers to risk management strategy that involves the contractual shifting of a risk to another party that is able to manage it effectively. It does not eliminate it, but it simply shifts responsibility.

ABSTRACT

Performance of construction projects in Kenya is a matter of great concern to stakeholders, as most of the construction projects have experienced delays and cost overruns which have adversely affected their performance. Construction projects are very prone to risk which have the significant impact on their performance in terms of time, cost and quality. As the size and complexity of construction projects increases, ability to manage risk throughout the construction process has become a key element of preventing the negative impact of risk. The general objective of the study was to investigate the effects of risk management Strategies and performance of construction projects in public Secondary schools in Murang'a County, Kenya. The specific objectives of the study was to; determine the influence of risk avoidance strategy, to establish the influence of risk reduction strategy, to examine the effectiveness of risk transfer strategy and to assess the effects of risk retention strategy and performance of construction projects in secondary schools in Murang'a County. The study was guided by Network theory, Enterprise Risk Management theory and Expectancy theory. The study employed descriptive research design while judgmental or purposive sampling technique was used to select public secondary schools in Murang'a County to participate in the study. The study used primary data which was gathered by administering questionnaires. Then the data was summarized and analyzed using descriptive and inferential statistics. Descriptive statistical involved the use of frequencies tables' standard deviation, mean and mode while inferential statistics included the use of regression analysis to analyze quantitative data. The findings of the study were presented in form of tables, frequencies, percentages, pie charts to ease interpretations and understanding. Analysis of the data was performed with the help of SPSS software where regression analysis was performed to determine the relationship between independent and dependent variable. The risk avoidance strategy was found to have the strongest influence on performance of construction projects since it had highest beta coefficient value while risk transfer had the lowest beta coefficient value. The analysis of research findings led to conclusion that risk management strategies have significant influence on performance of construction project in secondary schools. Furthermore, correlation analysis of risk management strategies and performance showed positive correlation. This study strongly recommends more studies in public secondary school, colleges and universities in other Counties in order to ascertain the in influence of risk management and performance of construction projects in education sectors. The study also recommends more research to be carried out in order to find out the relationship between risk management strategies and sustainability of construction projects in education sectors.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Construction projects are highly prone to risk which makes people working in these projects bear with failures like delays in completion, cost overruns and not bidding to quality which has resulted in poor performance of these projects. A Performance of the project can be determined by a number of indicators which include; cost, health, the satisfaction of the client, time, customers changes and business performance safety (Kibet 2016). The Concept of construction projects delays and cost overruns has now become a global phenomenon. The report issued by the chairman of Standish group in USA (CHAOS report 2009) showed that only 32% of construction projects were delivered successfully on time, 44% were challenged because they were not delivered on time and the budget was over and 24% of projected failed and canceled.

In Africa, failure of construction projects in education sector generates a cycle of rising expectations and unfulfilled promises. Most of the construction projects in Nigerian construction sector are faced with the problem of project delay. In their study, Ogunsemi and Jagboro (2006) found that construction projects in Nigeria are facing a serious challenge of cost overrun. In their study, Aibinu and Odenyinka (2006) assessed causes delay in construction projects in Nigeria. They evaluated nine factors which include; contractor, service engineer, architect, client, supplier, quantity surveyor, external factors, sub-contractor and structural engineer. The findings of their study identified ten overall delay factors which include; contractors financial difficulty, incomplete drawing by the architect, slow mobilization by the contractor, inadequate fund by a client, late delivery of materials by suppliers, problems of planning, scheduling by the contractor,

breakdown of the machines and late delivery by suppliers. The authors concluded that poor risk management strategies lead to project delay which results in a poor performance of construction projects.

In their study, Farida and El-sayegh (2006) found that poor supervision, lack of adequate skills, change of projects scope, poor site management, shortage of equipment and unsuitable leadership contribute to projects delays in the United Arab Emirates resulting to poor project performance. Oditi (2014) found that project delays and cost overruns happen in all sectors but not only in the construction sector. They also stated that to increase in cost overrun and delay of the construction project has a negative impact which affects the rate of national growth. According to Mbachu and Nkado (2004), most of the construction projects have experienced cost overruns during project delivery. This problem of not meeting cost has resulted in loss of clients' confidence and many investors terminating construction projects investments

In Kenya, Wafula (2011) carried a study in Kenya public construction projects. The findings of the study showed that out of 100 projects 73 % do not meet projects duration, while 38% experienced cost overruns which result in poor performance. Moreover, another study by Mbada (2016), carried out for both private and public construction projects got the same findings. The failure to meet cost and time will result in wastage of resources and consequently poor performance. A preliminary informal review by the researcher showed that most of the construction projects in Murang'a County have major challenges. In fact, the majority of the projects have not been completed on time and budget, others have stalled and others are abandoned resulting in poor performance.

1.1.1 Risk Management Strategies

The risk is the uncertainty that exists as to the occurrence of the event which causes economic value or loss (Green 1968). Gorrods (2004) defined risk management as an ongoing process that continues throughout the project life. Risk management is a process in which an organization identifies hazards affecting it and chooses the most suitable strategy for dealing with such exposures Redja (2008). An organization that actively identifies and manages risk is always in a better position to grab opportunities.

According to Dorfman (2007), there are several types of the risk strategies which can be used depending on the level of risk; transfer, retention, reduction, and avoidance of risk. Avoiding risk entails not involving yourself with activities that could carry risk. This can be seen as the solution to all risk but on the other hand, it can also translate to losing an opportunity that accepting the risk may have allowed. Risk avoidance is the most effective according to Dorfman (2007). Risk reduction involves reducing the likelihood of a loss occurring. Risk transferring involves transferring the responsibility to another party by contracting, insurance, legislation or other means. Risk retention can be defined as accepting the benefit of gain or loss when the risk occurs. This strategy can be used when the cost of insuring risk is greater over time than total losses incurred.

Risk management process suggested by Kiochos (1997) can heavily be applied in construction projects. Kiochos identifies a process of risk management that involves four steps namely; risk identification of likely loss, assessment of likely losses, and selection of potential methods for dealing with losses and finally implementation and for the administration of risk management program. Risk management is the ability of a human to recognize risk, assess risk and develop

the methods to mitigate and manage it using managerial resources. In short risk management process enables an organization to prepare for survival and reduce its exposure to the risk.

1.2 Statement of the problem

Projects are susceptible to risks and uncertainties of which failure to manage them appropriately can result in serious problems (Farrell, 2005). In their study, Carvalho and Junior (2013) surveyed risk management strategies in various industrial sectors in Brazil. The finding of the study showed that embracing best risk management strategies had a positive result on the success of a project. Rubio, Ferrada, Serpella, and Howard (2013) surveyed construction projects in Chile and the findings revealed that failure to use risk management practices in construction projects resulted in negative results. In Kenya, Ngugi and Odhiambo (2014) contended that effective risk management treatment resulted in the success of the projects as it lowers chances of occurrence of undesirable risk and reduces the risk impact when it occurs. Wachuru (2013) surveyed twenty-four constituency development fund (CDF) Kiambu county. The findings of the study project success were limited due to a dismal application of risk management practices.

The above citations suggest that strategies of risk management have proved to enhance the performance of a project. But, the applicability of these strategies has not been tested and empirically studied in case of construction projects school set up. For instance, it is not even clear whether using certain risk management strategies has quantifiable effects on performance of construction projects in public secondary schools. Numerous studies on effects of risk management strategies on the performance of projects have been conducted in other sectors but, little has been done in case of construction projects in the education sector in Kenya. It is in this

perspective this research examines influences of risk management strategies and performance in construction project in public secondary schools in Murang'a County

1.3 Objectives of the study

The objectives below was guided this research;

1.3.1 General objective

To investigate the influence of risk management strategies and performance of construction projects in public Secondary schools in Murang'a County, Kenya.

1.3.2 Specific Objectives

The study looked into the following specific objectives.

- (i) To determine the influence of risk avoidance strategy and performance on of construction projects in public secondary schools in Murang'a County.
- (ii) To establish the influence of risk reduction strategy and performance on of construction projects in public secondary school in Murang'a County
- (iii)To examine the influence of risk transfer strategy and performance on of construction projects in public secondary schools in Murang'a County.
- (iv)To assess the influence of risk retention strategy and performance on of construction projects in public secondary schools in Murang'a County.

1.4 Research questions

The research was directed by the questions below;

- (i) What are the influences of risk avoidance strategy and performance of construction projects in Murang'a County public Secondary Schools?
- (ii) What are the influences of risk reduction strategy and performance of construction projects in Murang'a public Secondary Schools?
- (iii) What are the influences of risk transfer strategy and performance of contraction projects in Murang'a County public Secondary Schools?
- (iv) What are the influences of risk retention strategy and performance of contraction projects in Murang'a County public Secondary Schools?

1.5 Significance of the Study

The research empirically tested effects of risk management strategies and performance of construction projects in public secondary schools in Murang'a County. Moreover, this research determined the connection between risk management strategies and performance of construction projects in Murang'a County. The research also produced literature which can be very useful to future researchers who might use it to further studies so as to solve future problems in the society. Furthermore, the stakeholders of community and government can use research findings in future development projects and determine how the established effect of risk management strategies can be improved in order to enhance the success of the construction projects.

1.6 Scope of the Study

The study was done to assess the influence of risk management strategies on performance of construction projects in public secondary schools in Murang'a County. The study was carried out in the whole County and in sample 5 schools in each Sub-County which was selected through purposive sampling. The study limited itself to construction projects done for the last 10 years.

1.7 Limitation of the Study

The first constraint was apathy of school heads towards giving information with respect to financial matters due to their conservative nature. Another limitation was that some respondents feared the administration and they were unwilling to give information. The purpose of this study was explained by the researcher in order to overcome this problem and confidentiality was guaranteed to respondents. Errors of biases were another limiting factor especially when filling questionnaires. To overcome this problem the researcher explained the purpose of carrying the study and urges the researcher to honesty as possible.

1.8 Organization of the Study

The research project is organized into five chapters. Chapter one comprises background of the study on performance of construction projects in public secondary schools in Murang'a County, problem statement, research objectives, research questions that the research purpose to answer, the significance of the study, study limitation, scope of the study and organization of the study. Chapter two discusses literature reviews on risk management strategies and performance of construction projects in public secondary schools. These discussions are based on objectives of

the research. Moreover, this chapter also discusses the theoretical review, empirical review of the literature, summary of the chapter and conceptual framework. Chapter three outlines research design, sample size, and sampling method, target population, data collection instruments, ethical consideration, reliability, and validity. Chapter four discusses findings of the study, data analysis using SPSS software and interpretations of the findings. Finally, chapter five discusses summary of the findings, conclusion and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the various literatures on risk management strategies and how they affect the performance of construction projects. The chapter also covers theoretical review and conceptual framework.

2.2 Theoretical literature review

According to Kothari (2003), the theoretical review is somehow related to abstract ideas that give the researcher an opportunity to have a philosophical stand. Theoretical framework affects the decisions made in the process of research.

2.2.1 Enterprise Risk Management Theory

According to Nocco and Stulz (2006), Enterprise Risk Management (ERM) is a risk management theory advocates for recommends for the measurement and management of notable risk facing a given entity whole than the management of each risk independently. Its main aim is to combine the risk management silos in an organization into one holistic and comprehensive framework. The ERM risk management framework of managing risk emphasizes that senior company executives and employees should actively be involved in risk management process of analyzing and responding to a wide range of company risks (Hallowell, Molenaar, & Fortunato, 2013). This concept encourages all members of the organization to be involved in the management of risks and not only one or a few members. The ERM also highlight the importance of clear process and policies for managing risks. According to Olson and Wu (2010), the theory also affirms that if

organizations can embrace formal policies that define risks appetite, strategic goals, tolerance and systematic processes then they can improve their risk management capacity of identifying, analyzing, and treating of risks. The theory also stresses on a creation of risk management culture where all stakeholders are empowered and accountable to manage risks. Cormican (2015) suggested that ERM practices involve increased competitive advantage, stakeholder confidence and long-term viability of organizations. The ERM theory has become popular in project management techniques despite the fact that it was developed for management of company risks. Drumll (2001) explains that adopting ERM philosophy in the construction industry is a wise decision as it applies to industries that have very high rates of failure like construction industry. These failures are as a result of failure to identify, mitigate and control risk across the entire business making this theory relevant to this research.

2.2.2 Network Theory

Network theory is a hypothesis that is used to clarify the structure and working of social frameworks. According to Fang, Marle, Zio&Bocquet (2015) this hypothesis sees social frameworks, for example, organizations or projects as a network that includes nodes and links associating these nodes. For example, in a given projects, the nodes may incorporate members of the project team, the task administrator, suppliers, owner of the project and project financiers. These nodes are associated with different connections such as supplier-buyer relationship, financing, legal, and working connections. The hypothesis clarifies that adjustments or unsettling influences in any node or line inside the system cause a progressively outstretching influence on every single other line and nodes. The theory is frequently used as a part of risk management to

clarify and educate the procedure of risk analysis. Moreover, according to Zingrand (2010), this theory also put more emphasis on the need to adopt a systematic approach when analyzing and understanding risk instead of concentrating on the risk consequences as one component of the project. It urges project team to consider how different segments of the project are interrelated and how obstruction in one component will influence other components of the project. This point of view of investigating risk empowers managers of the project to think of a more reasonable and all-encompassing evaluation of the effect of specific risk. This theory recommends that in order to judge the success of project management strategies the researcher should establish the extent at which this strategy holistic and comprehensive making this theory relevant to this research.

2.2.3 Expectancy Theory

The expectancy theory of motivation was developed by Vroom (1964). The theorist believes that motivation of the individual is determined by perception of relationship between the actions and rewards. The theory is categorized into three sections namely; expectancy, valence and instrumentality. Expectancy assumes that a certain level of effort will be followed with certain level of performance. Valence represents a value that a given outcome has for individual. Instrumentality relate to the connection between first level outcome like promotion and second level outcome such as raise. Thomas (1990) analyzed Vroom expectancy theory model in the context of construction industry, and found that the theory discusses variations of performance in terms of effort which the employee is willing to exert in order to finish a job. According to Thomas, the result performance could be observed based on efficiency, effectiveness, quality of work, innovation, profitability and productivity.

According to Gonzalez (1991), managers should determine the outcome of each employee values and define adequate and good performance, in terms that are observable and measurable so that employees understand managers' desires. Project managers in construction industries should also ensure that intended level of performance is attainable in fact; they should connect the outcome required by the workers to specific performance. This theory relates to performance of construction projects as it will help all stakeholders such as school heads, projects managers to develop measurement guide that can give important feedback to workers therefore improving performance of the construction projects.

2.3 Empirical Literature Review

According to Kendrick (2009), risk treatment or management strategy is a step that entails selection and implementation of measures to modify the most significant risks that are likely to be faced by a given project. It was revealed that success of risk management strategy is determined by the quality of risk analysis process (Luppino, Hosseini & Rameezdeen 2014). According to Li (2009), there is no 'one size suits all' strategy for managing risk and the success of any given risk is determined by the context and the nature of risk. In his study, he examined unique risks affecting oversee developments projects and recommended most appropriate risk management strategies. According to Hillson (2012), risk identification and analysis will be worthless without proper risk management strategies. He also noted that many construction projects do not have action plans for implementing strategies and structured strategies of responding to risks.

2.3.1 Risk Management Strategies and Performance Projects

Review of literature shows that construction projects susceptible to shortcomings which interfere with their success and final performance of the project. With time the complexity and size of projects increased and this translates that ability to manage risk is becoming the key factor in preventing consequences that are not required (Maytorena *et al.* 2007). According to Forbes (2008), research on risk management on construction sector has grown significantly high in the recent four decades. This is because construction projects are exposed to high risk as they come into existence as it involves many parties' such as designers, owners, and contractors.

It has been observed that most projects are completed with the cost higher than budgeted cost and completion dates exceeding their targets, and this has directed impact on overall performance of the project in both non-profit and profit organizations (Jones 2001). Project risk management gives a good opportunity for improving the performance of the project. It gives us a better understanding of potential threats and opportunities that can interfere with the performance of a project. Furthermore, it reduces the probability of failure and uncertainty and increases the probability of success, therefore achieving the organizational objectives. Findings from the research conducted by Cheng and Rahman (2013) showed that major risk in construction projects are time and financial risk due to poor planning and frequent late payment that affect the performance of construction industry. They both concluded that both risks affect construction performance in terms of cost, quality and time.

Ayub *et al.* (2007) contended that neglecting the risks throughout the project lifecycle certainly affects the performance of projects. This is why Kuotcha and Kululanga (2009) contended that most organization aim at determining the most effective approach to risk management so as to ensure excellent project performance. In fact, according to Tang (2007) and Ali and Siang (2012)

in order to achieve good performance management of risk must be considered as fundamental part of project management. This translates that practical risk management must be put into place so as to produce sustainable standards levels within the project. This value is realized by not incurring unnecessary and additional costs, accurate forecasting, tendering to the right people and ensuring that all estimates are justifiable.

Rasli and Masri (2008) noted that measuring the project performance is not an easy task, though it is practical to apply the traditional standards of time, quality and cost to determine the success of a project during construction. Therefore, it is important to focus time performance, as delaying a project result to project failure and this is why project fail resulting in reduced productivity and cost over-runs in a construction company (Atkinson, 1999). Ahsan and Gunawan (2010) proposed that the best method to measure the project performance is by establishing the difference between actual and planned duration. If a project is executed according to the planned sequence and in anticipated timescale then it is considered successful.

2.3.2 Risk Avoidance Strategy and Performance of Projects

Risk avoidance refers to not accepting the risk or any activity to ensure that risk will not occur (Dorfman, 2007). It is important to review project aim and just in case risk has a negative impact on the entire project, then the suitable remedy is to avoid it by either canceling entire project or changing the scope (Pott 2008). According to Cooper *et al.* (2005), activities like; operation reviews, more detailed planning, protection and safety systems, alternative approaches, permit to work, training and skills enhancement, procedural changes, regular inspections and preventive maintenance can help to avoid potential risks. Mhetre, Konnur and Landage (2016), proposed that removing the cause of risk will help to avoid the risk by implementing the project in a

different direction while focusing to achieve the objectives of the project. They also argued that risk avoidance involves the use of contingency plan to eliminate a threat.

In their study, Ahamed and Azhar (2004) assess recent practices of risk analysis and management embraced in Florida construction industry by contractors and compared it with other states construction industries that are considered highly profitable and modern. The findings from the study reveal that most favorite risk strategy adopted by contractors in Florida is risk avoidance with the response rate of 85%. The study also reveals that most companies eliminate risks by bidding at a very high price or not bidding for the job. Risk avoidance strategy was found to be one of the favored methods of management of risk in Florida, however, the respondents proposed this practice can lead low quality, low productivity, and delay of projects. According to Ploywarin and Song (2014), avoiding risks refers to taking an initiative to refuse project that may lead to risk. They also argue that construction project cannot eliminate all risk but by a method of risk aversion is suitable so as to reduce its occurrences which can cause damage. Also in their study, Ploywarin and Song analyzed risk response based on railway construction project in Thailand. The finding of research showed that contractor does not consider risk aversion in government construction program because the improvements in terms of probability are less. In fact, the research showed that there are many risk factors that contractor does not take into account as they consider a possibility of occurrence of risk small or even not happened.

Wanyonyi (2015) carried a survey on the influence of risk management strategies on the performance of selected international development organization based in Nairobi city. The study findings seem to collaborate with Merna (2004) that risk avoidance involves changing project plan so as to protect objectives of the project from repercussion of risk by eliminating the

condition that causes the risk. The study finding shows the existence of the statistically strong connection between avoidance of risk and the performance of the project. This was clearly shown by utilization of techniques in an effort to avoid risks which include the use of contingency plans, use of work plan in an implementation of projects, implementation of the safety plan and regular inspection to ensure no eventuality occurs that may interfere with the performance of the project.

2.3.3 Risk Reduction Strategy and Performance of Projects

Risk reduction refers to minimizing chances of the loss from happening. Gorrod, (2004). Moreover, risk reduction may time, require resources and thus presents a tradeoff between not doing anything versus the cost of reducing the risk (Scalable Project Risk Management Handbook version 1, 2012). A study conducted by Bhoola, Hiremath and Mallik (2014) assessed risk treatment strategies practiced in software development projects in India. They involved 302 project managers from various IT firms. The results from the study revealed that risk reduction strategy had the most significant success in software development projects. Other strategies of risk management like avoidance, transference, and acceptance were only reflected in the form transparency in communication to stakeholders.

Tesch *et al.* (2007) recognize a few risk reduction methodologies as risk reaction arrangements. As a risk reduction methodology, the writers recommend raising risk circumstances to higher administration. When there is lack of dedication from the administration or the client, the writers likewise recommend them to work together in order to comprehend the purposes behind lack of

concern. In their study, Roque and Carvalho (2013) assessed the risk management impact on the performance of projects in Brazil. The main study objective was to understand risk assessment outcome on the performance of IT. The survey was done in 415 different projects in various industrial sectors in various states in Brazil. The study findings showed positive results of adopting risk management control to reduce the occurrence of a risk factor.

Laurentiu and Gabriela (2013) explain the significance of a cost-benefit analysis on risks that exist in the project. They also recommend utilizing an affectability investigation to distinguish hazard parameters that may affect the development of the project, operational period and may prompt failure at a varied point of a life cycle of projects. Financing plays a very important role to which lead to risk alleviation exercises and empowering the framework to reestablish its usual working (Hecker, 2002). As indicated by Goble and Bier (2013) intermittent communication of risk appraisal results can alleviate project risk. They also suggested that risk assessments are chance evaluations of organized data and a medium for correspondence. Consequently, the reasonable utilization of risk appraisal apparatuses with sufficient communication can reduce risk very much (Veil & Husted, 2012). According to Alexandra-Mihaela and Danut (2013), internal communication is a very significant factor for project management success. Therefore, managers of the project adopt internal communication to ensure the project is delivered in an expected manner.

One approach to reducing risk in a project is to add an expenditure that can give benefits in the long run. Some people invest in projects that they are sure of their success or they may hire a specialist to manage very risky undertakings. Those specialists may discover solutions that the project group has not considered (Darnall & Preston, 2010). Risk reduction is all about

identifying those risks that may hinder achievement of objectives of the project and find ways of reducing this risk to levels that are acceptable. Risk reduction strategy can be accomplished by use of contingency plan.

2.3.4 Risk Transfer Strategy and Performance of Projects

Risk transfer according to Mhetre, Konnur and Landage (2016) entails sourcing another party who is prepared and willing to take its management control and financial responsibility when the risk occurs. They also argued that transferring risk does not eliminate it, as the risk will still exist but it is managed and possessed by another individual. In fact, according to them, risk reduction is the best strategy to deal with risk exposure. Mhetre, Konnur and Landage also concurred that the main of transferring risk is to make sure that is owned and handled by the best party.

According to Beard, (1982) allocating risk to the party best that will be able to control and anticipate risks is the best thing to do. These parties should be willing to accept the risks and also have the financial stability to sustain the consequences (Abednego & Ogunlana, 2006). Rahman & Kumaraswamy (2002) concurred that some risks for effective management they require a collaboration of contracting parties so that they can be managed effectively. In fact, they categorized joint risk management under relational contracting principles. These principles are important under various undertakings, which include the alliance of project and joint venturing (Jones 2008).

Pott (2008) contended that that risk can be transferred to parties who can manage it properly. According to him, risk can be transferred to various actors which include; the client, subcontractor, contractor, designer and insurer depending on characteristics of risks. He also said that this could result in additional work and higher cost usually referred to as the premium.

According to Darnall and Preston, (2010) shifting risks is the only alternative when risk cannot be controlled by project management team. Sometimes the situation consist unpredictable calamities which are rare in certain conditions. Unpredictable calamities should be transferred through insurance policies since they are beyond environmental control (Winch 2002).

In his study Koolwijk (2015), about risks shared and allocated by construction clients and contractors in Dutch Project Alliances observed that most risks items are difficult to anticipate during planning and design stage of construction. He also observed that some risks need to be a collaborative effort for many contracting parties for good management. They also found a list 16 risks items suitable for joint risk management. Koolwijk (2015) also investigated risk items shared between a client and a contractor in two different project alliances. The findings from the investigation showed a close similarity of the risk items to the one identified by Kumaraswamy and Rahman.

Ahamed and Azhar (2004) in their study assess recent practices of risk scrutiny and management embraced by contractors in Florida construction industry. The study findings also revealed that risk transfer strategy was adopted by more than 55% of respondents in Florida as their strategy of managing risk. Findings also reveal that contractors of Florida use both risk transfer through financial means such as insurance or to specialty subcontractor, however, favors transferring the risks to specialty sub-contractor when the loss expected is higher. Finally, the study also reveals that risk transfer sometimes can lead to poor quality, low productivity and project delays.

In their study, Renault and Agumba (2016) related the concept of risk and risk management in construction industry. In their study, they disclosed management of risk involves identifying, evaluating, prioritizing risks by monitoring and using capital in order to reduce the effect of risk

so as to achieve project objectives. Moreover, risk management may result in many advantages which include increased confidence in attaining objectives of the project, improving the likelihood of success and identification of good alternative course of action. The findings of the study further revealed that risk must be identified before it is mitigated or controlled. The study also revealed that risk avoidance, risk reduction, risk retention and transfer as techniques commonly used in responding to risks.

In their paper Bryan and Shapiro (2006), review the use of construction contracts and design as the best method of transferring risk in the construction industry which can have the effect of reducing costly and acrimonious disputes. According to them the party that is stronger tends to allocate unwanted risks that it does not want to incur into a weaker party and this does not always give efficient risk management process. Furthermore, improperly allocated risk can affect both stronger and weaker party. Bryan and Shapiro also advocate that transferring risk to the best party who are able to manage it inexpensively, effectively and easily will result to more profitable, successful project and consequently improve the performance of construction project.

2.3.5 Risk Retention Strategy and Performance of Projects

This is the option when the risk cannot be transferred or avoided. But, it must be controlled so as to reduce its impact (Potts, 2008). According to Thomas (2009), retention can also be the only choice when other risks management strategies are uneconomical. Risk retention it is all about accepting the existence certain circumstance of risk and formulation of serious resolution to allow the related level of risk, and not taking any unique treatment to curb it (Kerzner, 2003). Likewise, any measure of likely loss above the insured total called retained risk.

Moreover, if the probability of huge loss is minimal or if the insurance cost is too high such that it will interfere with organizational goals (Gorrod, 2004). Passive evaluation occurs due to an absence of decision-making, ignorance or through neglect, for instance, the risk at tendering phase has not been determined and therefore contractor performing work must bear the consequences. While active retention method is an intentional management action plans after the grim assessment of likely losses.

In their survey, Ploywarin and Song (2014) analyzed risk response based on railway construction project in Thailand. They divided risk retention into passive and active risk retention. Active risk retention means the risk identified consciously in a planned way, while passive risk retention which the project managers don't realize during the planning and are ready to deal with it. They also found that in engineering construction risk retention is mostly due to risk identification or analysis of respective errors and they proposed that risk management personnel should do their best to reduce the errors of risk identification and risk evaluation. In addition, Ploywarin and Song proposed that risk management personnel should make risk decision and implement these decisions on time for completion of significance and large construction projects. The study also found that risk retention measure is one of the common risk management strategies with 53.49 percent.

2.4 Summary of Literature Reviewed and Research Gaps

Table 2.1 presents summary of research gap. Most of the reviewed literature showed that risk management strategies enhance the performance of projects.

Table 2.1: Summary of Research Gaps

Author	Major Findings	Knowledge Gap	Focus of the current study
Wanyonyi (2015)	The objective of the study was to establish the influence of risk management strategies on project performance on selected international development organizations based in Nairobi. The findings of the study showed that employing risk management strategies in improves performance of international development organizations.	Wanyonyi (2015) proposed that similar study should be carried in all sectors so as to ascertain the influence of risk on performance of projects.	This study will focus on influence of risk management strategies on performance of construction projects in public secondary school.
Nyakundi (2011)	The objective of the study was to determine effect of risk management strategies on the performance of youth projects in Nyamira County. The findings of the study found that most of the project teams were equipped with risk management skills and were able to handle risks appropriately.	Numerous studies have been carried out on influence of risk management strategies, however there is scarcity on literature on influence of risk management strategies on performance of construction projects in case of education sectors.	This study will fill the empirical gap by investigating the influence of risk management strategies on performance of construction projects in public secondary schools Murang'a County.
Lagat (2015)	The objective of the study was to determine factors influencing completion of construction projects in public secondary schools in Bomet county. The study found that involvement of stakeholders influences performance of construction projects in secondary schools.	The study falls short in addressing influence of risk as a factor.	This study will focus on influence of risk management strategies on performance of construction projects in Public secondary schools in Murang'a County.

2.5 Conceptual framework

A conceptual framework is very important in a research, as it helps in making the conceptual distinction and organizing ideas. In this study risk management strategies is independent variable and it influences project performance which is the dependent variable. The key independent variables are risk retention, avoidance, reduction, and transfer. Based on proposed conceptual framework impacts of strategies of risk management on project performance was established.

Independent Variables

Risk Management Strategies

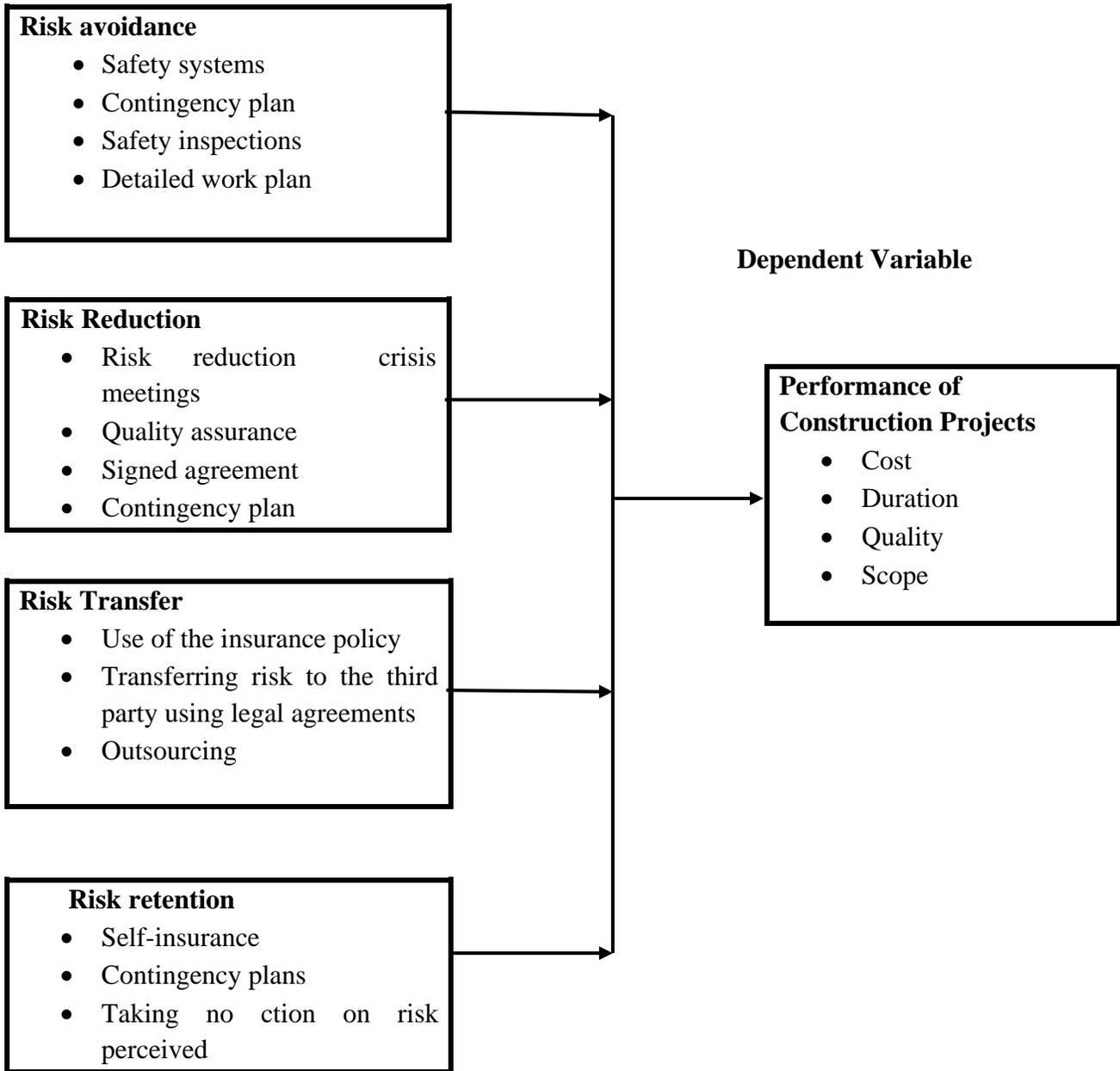


Figure 2.1: Conceptual Framework

Source: Researcher 2017

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the Research design, the target population, the procedure that was used to sample and the size of the sample. The chapter also describes instruments that were used in the study, techniques used to collect data, techniques used to analyze data, time plan and budget of the expenditure used carry the research.

3.2 Research Design

This study employed descriptive research design. In short, this method quantifies variables that exist naturally by gathering data on people's opinions, attitudes, and social issues. This method was used in this research so as to describe the opinions and attitude of study respondents on effects of risk management strategies and performance of construction projects in Murang'a County. According to Kothari (2009), research design should be very reliable and free from bias. This is why there is the need to use the descriptive survey as it ensures that respondents remain anonymous hence, generating reliable and truthful results.

3.3 Target Population

The Target population was 291 schools in Murang'a County which included 37 schools in Kahuro, 27 schools in Kangema, 37 schools in Kigumo, 34 schools in Gatanga, 31 schools in Mathioya, 55 schools in Kandara, 30 schools in Murang'a East and 40 schools in Murang'a South Sub-County. Table 3.1 shows the distribution of the target population.

Table 3.1: Distribution of the Target Population

S/NO	Sub-County	Schools
1	Kahuro	37
2	Kangema	27
3	Kigumo	37
4	Gatanga	34
5	Mathioya	31
6	Kandara	55
7	Murang'a East	30
8	Murang'a South	40
TOTAL		291

Source: Ministry of Education Murang'a County

3.4 Sampling Procedures and Sample Size

This study employed judgmental or purposive sampling technique to sample the schools required in this study. This technique is used to choose cases with particular information according to Neuman (2000). Therefore, the sample contained 136 respondents which are 13 percent of the entire population. Purposive sampling was used to select a total of 40 public schools, that is, 5 schools in every sub-county which have experienced construction projects for the last 10 years. According to mugenda and Mugenda (2003 the sample should be large enough to contain salient characteristics of the whole population. This means that the sample size constituted 40 principals, 40 BOM chairpersons and 40 accountants, 1 SCEOs and 1 SCQASOs. In fact, a sample should be small enough so as to be economical in terms of money, time and data analysis (Mugenda and Mugenda, 2003). Table 3.2 below shows distribution of the sample size.

Table 3.2: Sample Size

Description	Population	Percentage	Sample
Principals	291	13%	40
BOM Chairpersons	291	13%	40
Accountants	291	13%	40
SCEOs	8	13%	1
SCQASOs	8	13%	1
Total	889		136

Source: Researcher (2017)

3.5 Data Collection Instruments

Structured questionnaires were used to collect data for this study. Questionnaires were the most appropriate instrument as they provide a high degree of data standardization and generalization. Moreover, they are easy to administer and collect. According to Mugenda and Mugenda (2003) questionnaire are simple to administer, scoring of items and to analyze. The questionnaires contained open and closed questions so as to give respondents easy time to provide answers. The aim of the questions is to obtain data on the impact of risk management strategies on the performance of projects in public secondary school in Murang'a County.

3.6 Validity and Reliability of Research Instruments

Validity and reliability of the instruments was assessed as discussed in this section.

3.6.1 Validity of the Instruments

The validity of instruments relates to how well the test measures what it is required to measure. In other words, validity can be defined as meaningfulness and accuracy of inferences on the basis of study findings (Mugenda and Mugenda 2003). Content validity of the instruments was validated with the help of the supervisor to evaluate the relevance of each item to the objective of the study. Ambiguities of the research instruments were also determined by delivering pilot test. Finally, the analysis of pilot test was done and modification was made where necessary. The pilot test involved 10% of research respondents which included 3 principals, 3 board of management chairpersons, 3 accountants, 1 sub County education officer and 1 sub-county quality assurance officer.

3.6.2 Reliability of the Instruments

Reliability of the data collection instruments was measured through pre-testing questionnaires. These were administered and results of the test were used to calculate reliability coefficient. Internal consistency was measured by correlation of different items in the same test and it was measured using Cronbach's alpha. Cronbach's Alpha reliability coefficient for Likert-type scales test was performed so as to ensure the reliability of quantitative data. Once the test is performed the results that was above 0.7 was considered as reliable.

3.7 Data Collection Procedures

The identification letter obtained from the Kenyatta University was used to obtain research permit from Murang'a County Ministry of Education. Transmittal letter was used to introduce

the researcher to various respondents of the study. This study used primary data which was collected by administering printed structured questionnaires to the respondents. Questionnaires were hand delivered to various respondents of the study.

3.8 Data Analysis and Presentation

The collected data was analyzed and interpreted both quantitatively and qualitatively. Statistical Package for Social Scientists (SPSS) was used to sort out data collected from the study. Then the data was summarized and analyzed using descriptive and inferential statistics. Descriptive statistics involved use of frequencies tables standard deviation, mean and mode. Inferential statistics included the use of regression analysis to analyze quantitative data. Inferential statistics was used to determine the relationship between predictor variable and variables tested in the experiment. In addition, content analysis was also done so as to statistically estimate the correlation between patterns. Qualitative data was analyzed and described and summarized using qualitative statistical techniques. Finally, the data was presented in form of tables, frequencies, percentages, pie charts to ease interpretations and understanding. The regression formula that was used is $Y = \alpha + \beta_1 (R.Avd) + \beta_2(R.Rdn) + \beta_3(R.Tsnf) + \beta_4(R.Rtn) + \epsilon$, where Y was performance of the construction projects, α is constant (intercept coefficient) where β_1 , β_2 , β_3 , and β_4 are Beta coefficients, R. Avd= risk avoidance, R.Rdn = risk reduction, R. Tsnf= risk transfer and R.Rtn= risk retention while ϵ represent error terms.

3.9 Ethical Considerations

The privacy and confidentiality was observed by allowing the respondents to fill the questionnaire in privacy and ensuring that questionnaires do not have identifiable details. The

study protected the information given and ensures that it is confidential and consent was sought before revealing any information to someone else. Finally, before administering questionnaires informed permission was sought first.

CHAPTER FOUR

DATA ANALYSIS RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents findings, analysis and discussions of the study on risk management strategies on performance of construction projects in public secondary schools in Murang'a County, Kenya. The chapter consists of response rate and interpretation of the results.

4.2 Response Rate

This study targeted 136 respondents comprising of school principals, BOM chairpersons, accountants, SCEOs and SCQASOs. During data collection process 110 out of 136 of sampled respondents filled-in and returned questionnaires making a response rate to be 80.9%. Table 4.1 below shows the number of questionnaires returned by various sampled respondents of the study.

Table 4.1: Questionnaires Response Rate

Respondent category	Number targeted for response	Number responded	who	Percentage Response Rate
Principals	40	37		92.5%
BOM Chairpersons	40	34		85%
Accountants	40	37		92.5%
SCEOs	1	1		100%
SCQASOs	1	1		100%
Total	136	110		80.9%

Source: Researcher (2017)

4.3 Length of time one is holding the current position in school

The study finding in the Figure 4.2 shows that 21(19.1 percent) of the respondents held their current position in school for 0-2 years. Majority of the respondents, that is, 45 (40.9 percent) respondents have served in current position for 3-5 years while 29 (26.4 percent) have held their current position for 6-8 years. The study findings also show that 11 of the respondents (10 percent) have held their current positions for 9-11 years. Only 4 (3.6 percent) held their current position in school for over 11 years. The study finding show that majority of the respondents had held their position for more than 3-5 years which clearly led to conclusion that most of them had participated in constructions projects in the schools. Figure 4.2 below shows the length of the time one is holding the current position.

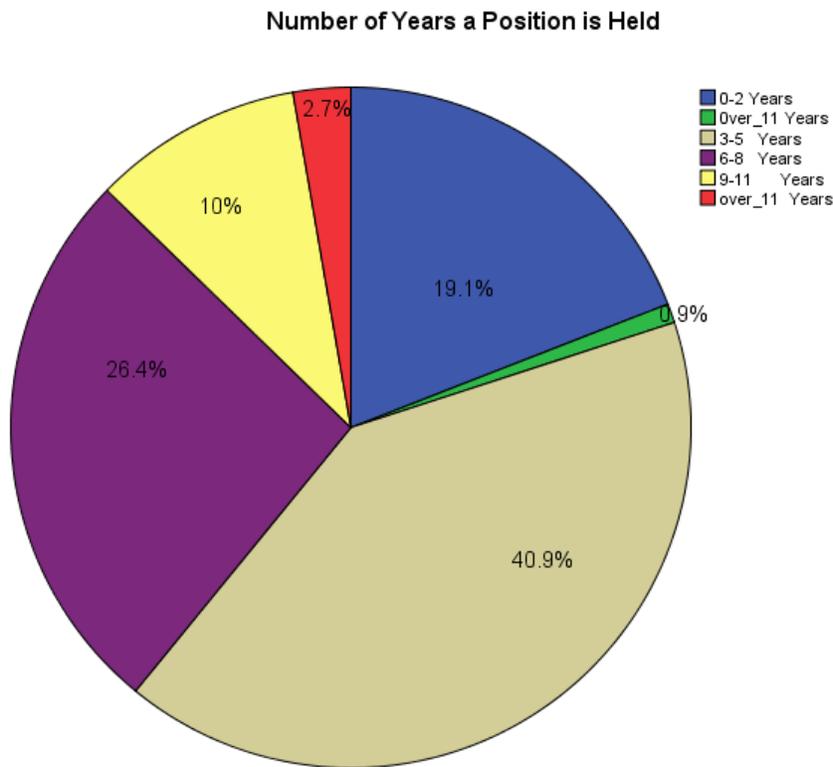


Figure 4.1: Graphical representation of number of years a position is Held

4.4 Gender of Respondents

The representation of the respondents who participated in the study by gender shows that 62.2 percent of the school principals were males while 37.8 percent were females. The findings also show that 52.9 percent of BOM chairpersons were males while 47.1 percent were females, 27.0 percent of accountants were males while 73.0 percent were females. The study involved 1 male SCEO and 1 female SCQASO. From the Figure majority of the respondents were female, represented by 52.7 percent as opposed to 47.3 percent males. The findings of the study show that the studied secondary schools have a slightly higher number of females than males. The difference is approximately 5.4 percent. Figure 4.2 illustrates representations by gender of the respondents who participated in the study.

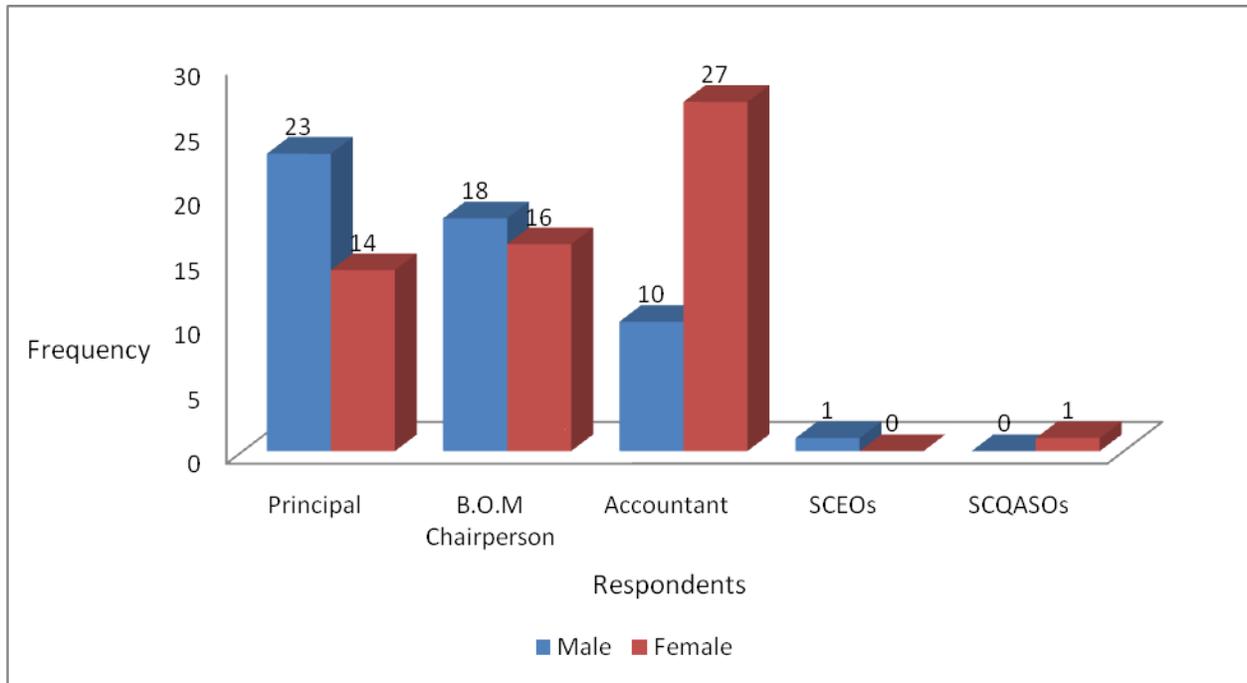


Figure 4.2: Graphical representation of gender of the respondents

Source: Researcher (2017)

4.5 Highest Level of Education

The findings of the study showed that only 3 (3 percent) of the respondents have a Phd which include 2 BOM chairperson, while 15 (13 percent) of the respondents had a post graduate degree and they constitute 9 principals, 5 BOM chairperson and 1 SCEO. The study findings also showed that majority of the study respondents have graduate degree which 57 percent of the respondents of the study, and this include 27 school principals, 20 BOM members, 9 accountants and 1 SCQASO. Moreover, the study finding also showed that 35 (32 percent) of the respondents of the study have diploma with 28 respondents being schools bursars and 7 BOM chairpersons. None of the respondents of the study has certificate qualifications. The table below shows the highest level of education of the respondents of the study.

Table 4.2: Highest Level of Education

Highest level of Education	Principal	BOM	Accountant	SCEO	SCQASO	Total
Phd	1	2	0	0	0	3%
Postgraduate	9	5	0	1	0	13%
Degree	27	20	9	0	1	52%
Diploma	0	7	28	0	0	32%
Certificate	0	0	0	0	0	0%
Total	37	34	37	1	1	100%

Source: Researcher (2017)

4.6 Influence of Risk Management Strategies of performance

The findings of the risk management strategies area discussed below.

4.6.1: Risk Avoidance Strategies

The first objective of the study was to determine the influences of risk avoidance strategy on performance of construction projects in Murang'a County Secondary Schools. Table 4.3 summarizes the findings of the explored risk avoidance strategies.

Table 4.3: Risk Avoidance Strategies

Risk Avoidance Strategies	Mean	Standard Deviation	5(SA)	4(A)	3(N)	2(D)	1(SD)
The school has installed safety systems against any occurrences that may delay construction project	4.01	1.177	48 43.6%	38 34.5%	6 5.5%	13 11.8%	5 4.5%
The school advocates use of alternative plan or contingency plan to avoid any circumstances that result to project delay and poor quality.	3.48	1.225	17 15.5%	60 54.5%	2 1.8%	21 19.1%	10 9.1%
The school regularly inspects construction projects to ensure no issue arises that may cause project delay.	4.05	1.082	47 42.7%	40 36.4%	7 6.4%	14 12.7%	2 1.8%
The school encourages the use of detailed work plan to ensure that no event that will arise that may delay construction project.	3.77	1.431	51 45.9%	23 20.7%	7 6.3%	18 16.2%	11 9.9%
The school has a programme of training project team to ensure that project run within the schedule.	3.12	1.040	3 2.7%	60 54.5%	3 2.7%	35 31.8%	9 8.2%
Aggregate Mean	3.686	1.176					

Source: Researcher (2017)

Research Finding presented in Table 4.3 shows 48(43.6 percent) of respondents strongly agreed, 38(34.5 percent) agreed, 6(5.5 percent) were neutral, 13(11.8 percent) disagreed and 5(4.5 percent) strongly disagreed regarding to whether the school had installed safety systems against any occurrences that may delay construction projects. Concerning contingency plan to avoid any circumstances that result to project delay and poor quality, 17(15.5 percent) of the respondents strongly agreed, 60(54.5 percent) agreed, 2(1.8 percent) not sure, 21(19.1 percent) disagreed and 10(9.1 percent) strongly disagreed. In respect to whether the school regularly inspects construction projects to ensure no issue arises that may cause project delay 47(42.7 percent) strongly agreed, 40(36.4 percent) agreed, 7(6.4 percent) were neutral, 14(12.7 percent) disagreed and 2(1.8 percent) strongly disagreed. While to whether the school encourages use of detailed work plan 51(45.9 percent) strongly agreed, 23(20.7 percent) agreed, 7(6.3 percent) were neutral, interestingly 18(16.2 percent) disagreed and 11(9.9 percent) strongly disagreed. Consequently, regarding to whether the school has a programme of training project team to ensure that project run within the schedule 9(8.2 percent %) strongly disagreed, 35(31.8 percent) disagreed, 3(2.7 percent) were neutral, 60(54.5 percent) agreed and only 3(2.7 percent) strongly agreed.

The findings show that majority of the respondents strongly agreed or agreed that the schools applied risk avoidance strategies since they either chose 5 or 4 respectively in likert scale in regard to school installing safety system, use of contingency plan, inspecting construction projects regularly and use of detailed work plan. The findings of the study collaborated with the findings of Merna (2004) that risk avoidance involves changing project plan so as to protect objectives of the project from repercussion of risk by eliminating the condition that causes the risk. This was clearly shown by utilization of techniques in an effort to avoid risks which include the use of contingency plans, use of work plan in an implementation of projects, implementation

of the safety plan and regular inspection to ensure no eventuality occurs that may interfere with the performance of the project. A mean of 3.686 which approximately 4 show that majority of the respondents gave a positive response that schools are able to apply risk avoidance strategies in construction projects.

4.6.2 Risk Reduction Strategies

The study also sought to establish the influence of risk reduction strategy on performance on of construction projects in public secondary school in Murang’a County. In order to determine the influence the researcher asked the respondents to respond to statements aimed at assessing risk reduction strategies. Table 4.4 presents findings on various explored risk reduction strategies.

Table 4.4: Risk Reduction Strategies

Risk Reduction Strategies	Mean	Standard Deviation	5(SA)	4(A)	3(N)	2(D)	1(SD)
The school holds crisis meeting regularly with project management team to identify and solve any issue that may cause project delay	3.65	1.259	33 30%	39 35.5%	13 11.8%	17 15.5%	8 7.3%
The school adopts quality assurance techniques to eliminate any situation that may cause the delay of the construction project.	3.14	1.009	8 7.3%	31 28.2%	48 43.6%	14 12.7%	9 8.2%
The school obeys signed agreements and contracts on issues that may affect duration and quality of construction projects.	4.15	1.099	53 48.2%	38 34.6%	5 4.5%	10 9.1%	4 3.6%

The school advocates use of alternative plan or contingency plan to avoid any circumstances that result to project delay and poor quality.	3.57	1.207	7 6.4%	22 20.0%	5 4.5%	53 48.2%	23 20.9%
Aggregate Mean	3.628	1.144					

Research Findings presented in table 4.4 33(30 percent) strongly agree, 39(35.5 percent) agreed, 13(11.8 percent) were neutral, 17(15.5 percent) disagreed and 8(7.3 percent) strongly disagreed in regard to holding crisis meeting regularly. In respect to whether school adopts quality assurance techniques to eliminate risk only 8(7.3 percent) strongly agreed, 31(28.2 percent) disagreed, interestingly 48(43.6 percent) were neutral, 14(12.7 percent) disagreed and 9(8.2 percent) strongly disagreed. Yet a question on whether the school obeys signed agreements and contracts on issues that may affect duration and quality of construction projects 53(48.2 percent) strongly agreed , 38(34.6 percent) agreed, 5(4.5 percent) were neutral, 10(9.1 percent) disagreed, and 4(3.6 percent) strongly disagreed. Finally, in regard the school adopts alternative plan to avoid any circumstances 7(6.4 percent) strongly agreed, 22(20.0 percent) agreed, 5(4.5 percent) were neutral, 55(48.2 percent) disagreed and 23(20.0 percent) strongly disagreed.

The aggregate mean is 3.628 which is approximately 4. This implies that majority of the respondents accepts that schools applied examined risk reduction strategies. The findings of the study collaborated with the findings of the study conducted by Bhoola, Hiremath & Mallik (2014) in IT firms in India, where the findings of the study revealed that risk reduction strategy had a the most significant success in software development projects. In addition, the findings of

the study also confirmed assertion of Darnall & Preston (2010) that risk can be reduced by use of contingency plan.

4.6.3 Risk Transfer Strategies

The study also sought to examine the influence of risk transfer strategy on performance on of construction projects in public secondary schools in Murang'a County. Table 4.5 summarizes the findings of the explored risk transfer strategies.

Table 4.5: Risk Transfer Strategies

Risk Transfer Strategies	Mean	Standard Deviation	5(SA)	4(A)	3(N)	2(D)	1(SD)
The school purchases insurance premium on some of the construction items to ensure no circumstance will cause the delay of construction projects.	1.42	0.850	2 1.8%	4 3.6%	2 1.8%	22 20.0%	80 72.7%
The school signs legal agreements mostly to any event that may resulting delaying the construction project.	2.86	1.523	20 18.1%	28 25.5%	11 10.0%	19 17.3%	32 29.1%
The school outsources those construction functions that may cause delay when performed by the project team.	3.48	1.081	16 14.5%	47 42.7%	29 26.4%	10 9.1%	8 7.3%
Aggregate Mean	2.587	1.151					

The research findings presented in Table 4.5 shows that out of 110 respondents 2(1.8 percent) strong agreed that the school purchases insurance premium on some of the construction items, 4(3.6) agreed, 2(1.8 percent) were neutral, 22(20.0 percent) disagreed and ironically 80(72.7 percent) strongly disagreed. In respect to whether school signs legal agreements mostly to any event that may result in delaying the construction project 20(18.1 percent) strongly agreed, 28(25.5 percent) agreed, 11(10.0 percent) were neutral, 19(17.3 percent) disagreed and 32(29.1 percent) strongly disagreed. In regard to whether the school outsources those construction functions that may cause delay when performed by the project team 16(14.5 percent) strongly agreed, 47(42.7 percent) agreed, 29(26.4 percent) were neutral, 10(9.1 percent) disagreed and 8(7.3 percent) strongly disagreed.

The reason for obtaining this data is to determine how a risk transfer strategy affects the performance of construction projects. Majority of the respondents (57.2 percent) proposes that the school outsources those functions that may cause delay when performed by projects team. These findings are in consistent with Mhetre, Konnur and Landage (2016) who argued that transferring risk entails outsourcing another party who is prepared and willing to take its management control and financial responsibility when the risk occurs. However, 72.7 percent and 20 percent of the respondents chose 5 and 4 respectively in likert scale, meaning they opposes school purchasing insurance premium on some items as risk transfer strategy. These findings of the study in regard to school purchasing insurance premium on some items disagrees with the findings of Ahamed and Azhar (2004), who found that majority of respondents in Florida construction industry transfers risk by use of insurance premium.

4.6.4 Risk Retention Strategies

The last object is to assess the influence of risk retention strategy on performance on of construction projects in public secondary schools in Murang'a County. Table 4.6 presents the findings of examined risk reduction strategies.

Table 4.6: Risk Retention Strategies

Risk Retention Strategies	Mean	Standard Deviation	5(SA)	4(A)	3(N)	2(D)	1(SD)
The school adopts self-insurance against any circumstances that may cause project delay	2.48	1.366	6 5.5%	33 30.0 %	6 5.5%	28 25.5 %	37 33.6 %
The school advocates use of contingency plan to avoid any circumstances that result to project delay.	3.03	1.523	22 20.0%	34 30.9 %	7 6.4%	19 17.3 %	28 25.5 %
The school sometimes takes no action to identified risks despite the fact that they may affect the duration of the construction project, as it is beneficial not to deal with them.	3.91	0.934	29 26.4%	55 50.0 %	14 12.7 %	11 10.0 %	1 0.9%
Aggregate Mean	3.14	1.274					

Research Findings presented in Table 4.6 in regard to school adopting self-insurance against any circumstances that may cause project delay shows that 6(5.5 percent) strongly disagreed, 33(30.0 percent) disagreed, 6(5.5 percent) were neutral, 28(25.5 percent) disagreed and 37(33.6 percent) strongly disagreed. In respect to project performance contingency plan to avoid any circumstances that result to project delay 22(20.0 percent) strongly agreed, 34(30.9 percent)

agreed, 7(6.4 percent) were neutral, 19(17.3 percent) disagreed and 28(25.5 percent) strongly disagreed. Concerning taking no action to identified risks despite the fact that they may affect the duration of the construction project, as it is beneficial not to deal with them 29(26.4 percent) strongly agreed, 55(50.0 percent) agreed, 14(12.7 percent) were neutral, 11(10.0 percent) disagreed and 1(0.9 percent) strongly agreed.

The reason for obtaining this data is to determine how a retention strategy affects the performance of construction project. The findings of the study are in agreement with the finding by Theuri (2012) in regard of not taking action against identified risk, who found that majority of the project officials in rural based business projects were on view of not taking no action against risk if the cost is high that total loss. Some of the risks identified include shortage of resources, lack of security and management. The findings also show that 59.1% of the respondents opposes that schools adopt insurance against circumstances that may cause risk. However the findings oppose the assertion by Winch (2002) that unpredictable calamities should be retained by use of insurance policies.

4.7: Performance of Construction Projects

The findings of the performance are summarized in Table 4.7 below.

Table 4.7: Performance of the construction projects

Project Performance	Mean	Standard Deviation	5(SA)	4(A)	3(N)	2(D)	1(SD)
In my own point of view, risk avoidance leads to timely completion of construction projects.	3.88	1.194	38 34.5%	48 43.6%	4 3.6%	13 11.8%	7 6.4%
In my own point of view reduction of risk lead to the timely completion of construction projects.	3.36	1.283	22 20.0%	42 38.2%	9 8.2%	28 25.5%	9 8.2%
In my own point of view transferring risk to third-party lead to the timely completion of construction projects.	3.31	1.240	20 18.2%	39 35.5%	13 11.8%	31 28.2%	7 6.4%
In my own point of view, retention risk lead to timely completion of construction projects	3.28	1.355	22 20.0%	40 36.4%	9 8.2%	25 22.7%	14 12.7%
In my own opinion, I have successfully completed construction projects on time.	3.79	1.264	42 38.2%	32 29.1%	14 12.7%	15 13.6%	7 6.4%
Aggregate Mean	3.524	1.267					

The study findings showed that 38(34.5 percent) of respondents strongly agreed that risk avoidance leads to timely completion of construction projects, 48(43.6 percent) agreed, 4(3.6 percent) were neutral, 13(11.8 percent) disagreed and 7(6.4) strongly disagreed. Risk lead to the

timely completion of construction projects was the opinion of 64(58.2 percent) respondents, of whom 22(20.0%) and 42(38%) strongly agreed and agreed respectively. Only 28 percent disagreed that reduction of risk lead to timely completion of construction projects with 9(8.2 percent) strongly disagreeing, while 9(8.2 percent) were neutral. In regard to opinion whether transferring risk to third-party lead to the timely completion of construction projects 20(18.2 percent) strongly agreed, 39(35.5 percent) agreed, 13(11.8 percent) were neutral, 31(28.2 percent) disagreed with 7(6.4 percent) strongly disagreeing.

In respect to the risk retention, 42(56.4 percent) of respondents were for the opinion that risk retention lead to timely completion of the project, of whom 22(20.0 percent) and 40(36.4) strongly agreeing and disagreeing respectively. However, 9(8.2 percent) of respondents were neutral while 25(22.7 percent) and 14(12.7 percent) disagreed and strongly disagreed respectively. Majority of the respondents were for the opinion that they have successfully completed construction projects on time, of whom 42(38.2 percent) and 32(29.1 percent) strongly agreed and agreed respectively. Those who were for the opinion that they have not successfully completed construction projects 15(13.6 percent) disagreed while 7(6.4 percent) strongly disagreed. Only 14(12.7 percent) were neutral.

The findings of the Table 4.7, show that aggregate mean score is 3.524 which is approximately 4. This shows that majority of the respondents positively agrees that risk avoidance strategy, risk reduction, risk transfer and risk retention strategy improves the performance of construction projects by leading to timely completion projects. Moreover when asked whether risk management strategies improve construction project majority of the respondents gave positively response that they have successfully completed construction projects on time, perhaps because

they applied risk management strategies. This is in line with Mburu, Kinyua and Ogolla (2015) where 90 percent of the respondents agreed that risk management strategies enhance performance of the ICT projects. Similarly, majority (93 percent) of the respondents of the study by Mwangi, Kipyegon and Kimani (2012) firmly agreed that risk management strategies contribute to project success. In addition, the findings of this study collaborate with the findings of the survey conducted by Carvalho and Junior (2013) in various industrious sectors in Brazil which showed that embracing best risk management strategies had a positive result on the success of a project.

When asked other factors affect performance of the construction projects majority of the respondents reported lack of stakeholders' involvement as one of the major factor. This findings is congruent with the study by Wu and Olson (2010) where majority of the respondents reported that school's management should involves all stakeholders in process of identifying risks. The findings of this study report that majority of the respondents (mean 3.79) have successfully completed construction project on time. This findings are in consistent with the findings of the study by Mwangi (2016) which found that majority of the respondents reported that over 50 percent of projects in schools were completed with time and budget. Remember Wachuru (2013) concurred that projects should be considered successful if they are completed within the time, budget and requirements. The opinions of the respondents suggest that most of the schools in Murang'a County have successfully completed construction projects on time.

4.8: Opinion on Whether Risk Management Improve Construction Projects

In regard to the opinion on whether risk management strategies improve project performance 60.9 percent and 39.1 percent of the respondents agreed and opposed respectively. These

findings corresponds to findings by Rubio, Ferrada, Serpella, and Howard (2013) who surveyed construction projects in Chile and the findings revealed that failure to use risk management practices in construction projects resulted in negative results. Figure 4.3 illustrates the findings on whether risk management strategies improve project performance.

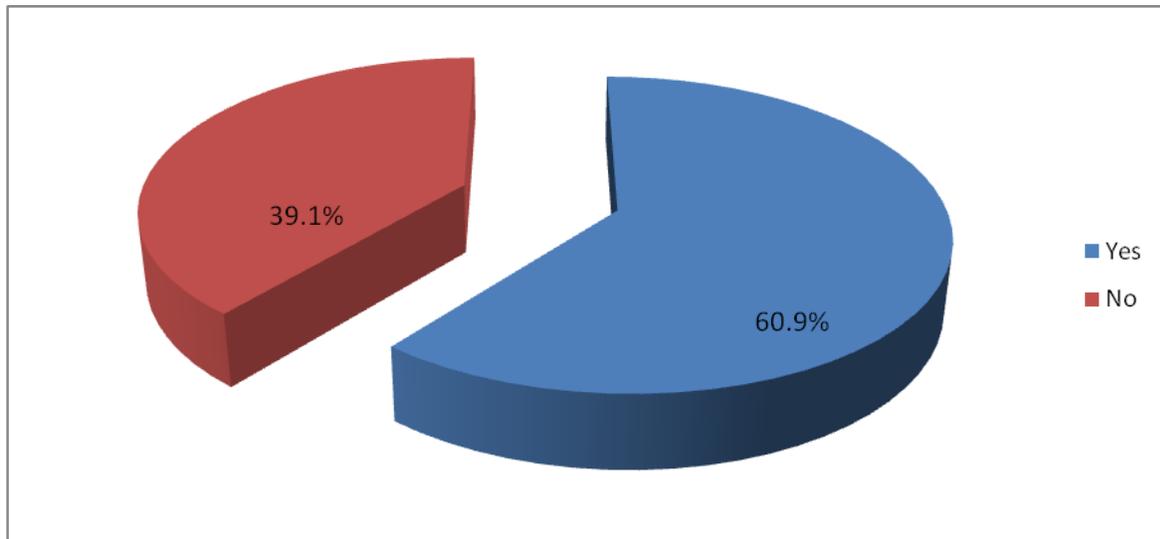


Figure 4.3: Graphical representation on opinion on whether risk management strategies improve project performance.

Source: Researcher (2017)

4.9: Regression analysis on risk management strategies and performance of construction projects.

In order to determine how risk management strategies influence performance of the construction projects in public secondary schools, regression analysis was performed. The respondents overall average scores of risk management strategies was taken as independent variables while the average scores on performance was taken as dependent variable. Therefore, multiple regression

analysis was performed by regressing mean scores of risk management strategies (independent variable) against performance of construction projects (dependent variables). The regression was $Y = \alpha + \beta_1 (R.Avd) + \beta_2(R.Rdn) + \beta_3(R.Tsnf) + \beta_4(R.Rtn) + \epsilon$, where Y was performance of the construction projects, α is constant (intercept coefficient) where β_1 , β_2 , β_3 , and β_4 are Beta coefficients, R. Avd= risk avoidance, R.Rdn = risk reduction, R. Tsnf= risk transfer and R.Rtn= risk retention while ϵ represent error terms. R-squared statistically measure how close the data are to the fitted regression line. The results from Table 4.8, shows that the model was statistically significant, where (R Square = .402, $p < .001$), which translates that the independent variables (risk avoidance, risk reduction, risk transfer and risk retention) explains 40.2% of the changes in performance of construction projects. The p- value of the F tests was 0.00 which is lower than 0.01 level of significance, this clearly concludes that independent variable have statistically significant relationship with performance of construction projects.

Table 4.8: Regression Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.634 ^a	.402	.380	.459	.402	17.670	4	105	.000

a. Predictors: (Constant), Risk retention, Risk avoidance, Risk reduction, Risk transfer

b. Dependent Variable: Performance of construction projects

The beta coefficient is a measure of how risk management strategies influences performance of construction projects in public secondary schools in Murang’a. The Beta coefficients show that risk management strategies had significance influence on performance of construction projects in public secondary schools in Murang’a County. The risk avoidance strategy was found to have the strongest influence on performance of construction projects since it had highest beta coefficient value (0.265). The substituted regression analysis equation based on various Beta coefficients was; $Y=0.858 + 0.265(R.Avd) + 0.228(R.Rdn) + 0.114(R.Tsnf) + 0.130(R.Rtn) + \epsilon$. The summarized regression analysis coefficients are presented in Table 4.9 below.

Table 4.9: Regression Analysis Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.858	.300		2.855	.005
Risk avoidance	.265	.074	.302	3.577	.001
Risk retention	.228	.068	.274	3.355	.001
Risk transfer	.114	.058	.165	1.982	.050
Risk retention	.130	.059	.180	2.216	.029

4.10: Correlation Analysis

This study used the Spearman correlations analysis to further investigate the influence between risk avoidance, risk reduction risk transfer and risk retention and performance of construction projects in public secondary schools. The first objective of the study is to investigate the influence of risk avoidance strategies on performance of construction projects in public secondary schools in Murang'a County. The results of Spearman correlation test in Table 4.10 shows that p-value of risk avoidance strategy is 0.000, which indicate existence of a significant influence of risk avoidance strategy and performance of construction projects at a significance level of 0.01. These findings correspond with assertion by Waiswa (2015) that risk avoidance of is the most effective method of risk management. The spearman rho (ρ) correlation coefficient value between risk avoidance strategies and performance of construction projects is 0.427. This correlation lies between +0.3 and +0.7 which indicates a positive influence of moderate strength according to Mukaka (2012). This clearly suggests that improving risk avoidance strategies increases chances of success of construction projects in secondary schools.

The second objective was to examine the influence of risk reduction strategies on performance of construction projects in public secondary schools. The result of Spearman correlation test in shows that p-value of risk reduction strategy is 0.000, which indicate existence of a significant influence of risk reduction strategy and performance of construction projects at a significance level of 0.01. The spearman rho (ρ) correlation coefficient value between risk reduction strategies and performance of construction projects is 0.320 which suggest a positive correlation between risk reduction strategies examined and performance of construction projects. This

suggests that risk improving risk reduction strategies will increase chances of success of construction projects in public secondary schools in Murang'a County.

Furthermore, the results of Spearman correlation test shows that p-value of risk transfer strategy is 0.000, which indicate existence of a significant influence of risk transfer strategies and performance of construction projects at a significance level of 0.01. The spearman rho (ρ) correlation coefficient value between risk reduction strategies and performance of construction projects is 0.386 which suggest a positive correlation between risk retention strategies examined and performance of construction projects. This suggests that risk improving risk transfer strategies will increase the performance of construction projects in public secondary schools in Murang'a County.

The last objective of the study was to assess the influence of risk retention strategy on performance on of construction projects in public secondary schools in Murang'a County. The results of Spearman correlation test in shows that p-value of risk retention strategy is 0.000, which suggest existence of a significant influence of risk transfer strategies and performance of construction projects at a significance level of 0.01. The spearman rho (ρ) correlation coefficient value between risk retention strategies and performance of construction projects is 0.377 which suggest a positive correlation between risk retention strategies examined and performance of construction projects. Similarly, this suggests risk retention strategies improve the performance of construction projects in public secondary school in Murang'a County. The findings in Table 4.10 present correlation coefficient values and P-values of examined risk management strategies on performance of construction projects.

Table 4.10: Results of Correlation Analysis

Risk Management Strategies	Correlation Coefficient, r	P Value
Risk Avoidance	.427	0.000
Risk Reduction	.320	0.000
Risk Transfer	.386	0.000
Risk Retention	.337	0.000

CHAPTER FIVE

SUMMARY, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1: Introduction

This chapter summarizes findings and discussions of the research project on influence of risk management strategies on performance of construction projects in Murang'a County. It also gives recommendation for further researches.

5.2: Summary of the Study

The first objective of the study was to examine the influence of risk avoidance strategy on performance on of construction projects in public secondary schools in Murang'a County. The descriptive analysis results indicated that project management teams in of public secondary schools in Murang'a County were applying best risk avoidance strategies. Majority of the respondents reported to be applying risk avoidance strategies such as; use of safety systems against any occurrences of risk, use of contingency plan, regularly inspecting construction projects and also encourages uses of detailed work plan to ensure that no event that will arise that may delay the project. Spearman correlation analysis revealed that application of risk avoidance strategies had a positive influence on performance of construction projects in public secondary school in Murang'a County.

Secondly, the study was to establish the influence of risk reduction strategy on performance on of construction projects in secondary school in public secondary schools Murang'a County. The descriptive analysis indicated that majority of people responsible in managing projects are applying risk reduction strategies such as holding crisis meeting regularly, adopting quality

assurance techniques, obeying signed agreements and contracts as risk reduction strategies. Regression analysis showed that risk reduction strategies had significance influence on performance of construction projects in secondary school. Similarly, Spearman correlation coefficient confirmed a significant positive influence of risk reduction strategies on performance of construction projects.

The third objective of the study was to examine the influence of risk transfer strategy on performance on of construction projects in public secondary schools in Murang'a County. Descriptive statistics show that majority of the projects teams in schools are applying risk transfer strategies in the construction projects. Regression analysis beta coefficient confirmed the influence of risk transfer strategies on performance of construction projects. Spearman correlation test showed that risk transfer strategies had a significant positive correlation to the performance of construction projects.

The last objective was to assess the influence of risk retention strategy on performance on of construction projects in secondary public schools in Murang'a County. Descriptive statistics revealed that most of the school embraced risk retention strategies such as adopting self-insurance, use of contingency plan and sometimes not taking any action to identified risk. Regression analysis beta coefficient showed a significance influence of risk retention strategies on performance of construction projects. Spearman correlation analysis revealed that application of risk retention strategies had a positive influence on performance of construction projects in public secondary school in Murang'a County.

5.3 Conclusion

The general objective of this study was to investigate the influence of risk management strategies and performance of the construction projects in public secondary schools in Murang'a County. Analysis of the research findings led to conclusion that risk management strategies have significant influence on performance of construction project in secondary schools. The research revealed that the explored risk management strategies have significant influence on performance of construction projects in public secondary schools in Murang'a County. Risk avoidance strategies were found to have the highest influence on performance of construction projects in secondary schools.

Risk retention strategy was found to have the lowest influence but within the range of moderate strength. Analysis of the results also confirmed that risk transfer had a significance influence on performance of construction projects in public secondary schools. Moreover, the results suggest that improving risk transfer strategies will improve performance of construction projects. Risk retention too was found to have a significance influence on performance of construction projects in public secondary schools in Murang'a County. The research findings also found that majority school project management team positively agreed to have completed construction projects on time, which revealed that majority of the secondary schools in Murang'a County have completed construction projects on time due to application of effective risk avoidance strategies. The study objective was accomplished since the influence of risk management strategies and performance of construction projects in public secondary school in Murang'a County was determined.

5.4 Recommendations

Every project manager would desire to perform and finish project within time, satisfy customers requirements, quality and set budget. However, sometimes this is not realized due to predicaments caused by risks and uncertainties that interfere with set objectives. Therefore there is the need for managing this risks effectively in order to increase chance of completing construction projects within the require time and budget. That why it is worthwhile to incorporate strategies to manage risk in construction projects. From the data analysis the influence of risk management strategies in performance of construction projects cannot be ignored. The current limited itself to public secondary schools in Murang'a County. This study strongly recommends more studies in public secondary school, colleges and universities in other Counties in order to ascertain the in influence of risk management on performance of construction projects in education sectors. This study was able to determine the influence of risk management strategies and performance of construction projects in secondary schools. However, more research should be carried out in order to find out the relationship between risk management strategies and sustainability of construction projects in education sectors.

REFERENCES

- Alexandra P., & Danut D. D. (2013). *The measurement and evaluation of the internal communication process project management*; Annals of the University of Oradea, Economic Science Series, 22(1).
- Chirwa, D., Samwinga, V., & Shakantu, W. (2011). *Timely Project Delivery: a case study of Malawian educational projects*. Education Infrastructure Management Unit (EIMU), Lilongwe, MALAWI, ASOCSA journal 2011- 46 - 567-584.
- Cooper, D., Grey, S., Raymond, G. & Walker, P. (2005). *Managing risks in large projects and complex procurement*. Chichester: John Wiley.
- Dorfman, M.S. (2007). *Introduction to Risk Management and Insurance, (9ed.)*. Englewood Cliffs, N.J: Prentice Hall.
- Douglas, H. (2009). *The failure of risk management: Why It's Broken and How to fix it*. NewYork: John Wiley and Sons.
- Fang, C., Marle, F., Zio, E., & Bocquet, J. (2015). Network theory-based analysis of risk interactions in large engineering projects. *International Journal of Project Management*, 19 (1), 157- 169.
- Goble, R., & Bier, V. M (2013). Risk assessment can be a game-changing information technology but too often it isn't; *Risk Analysis: An International Journal*; 33 (11), 1942-1951. Javed, A. A.; Lam.
- Gorrod, M (2004). *Risk Management Systems: Technology Trends (Finance and Capital Markets)*. Basingstoke: Palgrave Macmillan. ISBN 1-4039-1617-9.

- Gwaya, A. (2014). Development of appropriate project management factors for the construction industry in Kenya. *International Journal of Soft Computing and Engineering (IJSCE)* ISSN: 2231-2307, Volume-4, Issue-1, March 2014: Blue Eyes Intelligence Engineering & Sciences Publication Pvt. Ltd.
- Junior, R., & Carvalho, M. (2013). Understanding the impact of project risk management on project performance: An empirical study. *Journal of Technology Management & Innovation*, 8 (1), 64- 78.
- Kerzner, H. (2003). *Project Management: A System Approach to Planning, Scheduling and Controlling*. 8th Ed. New Jersey: John Wiley & Sons.
- Kerzner, H. (2009). *Project Management; A Systems Approach to Planning, Scheduling and controlling*. USA: John Wiley and Sons.
- Kibet, A. (2004). PPMS: a Web-based construction a project performance monitoring system, *Automation in Construction* 13: 361–376.
- Kinuthia W. (2009). Educational development in Kenya and the role of information and communication technology. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 2009, Georgia State University, USA. Vol. 5, Issue 2, pp. 6-20
- Kinyua, E., Ogollah, K., & Mburu, D. (2015). Effect of risk management strategies on project performance of small and medium information communication technology enterprises in Nairobi, Kenya. *International Journal of Economics, Commerce, and Management*, 3 (2), 17- 24.
- Kombo, D.K., & Tromp, D.L.A., (2006). *Proposal and Thesis Writing: An Introduction*, (2nd Reprint, Don Bosco Printing Press, Makuyu.

- Kothari, C. R. (2009). *Research Methodology: Methods and techniques (2nd Revised Edition)*.
New Delhi: New Age International.
- Kumaraswamy, M.(1997). Conflicts, claims and disputes in construction engineering.
Construction and Architectural Management, 4(2): 66-74.
- Kumaraswamy, M.H. (1998).Consequences of construction conflict: a Hong Kong perspective.
Journal of Management in Engineering, 14(3):66–74.
- Langat, D. K. (2015).*Factors influencing completion of construction projects in public secondary schools in Bomet east sub-county, Bomet county, Kenya* (Doctoral dissertation, University of Nairobi).
- Mbachu J.I.C. & R.N. Nkado. (2004). Reducing Building Construction Costs; the Views of Consultants and Contractors. COBRA
- Mbachu, J.; Nkando, R. (2007).*Factors constraining successful building project implementation in South Africa, Construction Management and Economics* 25(1): 39 54.
- Mbada, P. K. (1989): *Cost and Time Overruns, Building Projects in Kenya*, University of Ghana, M.A. Thesis (unpublished).
- Mugenda and Mugenda (2003). *Research Methods: Qualitative and quantitative approaches*
Nairobi: Acts Press.
- Odhiambo, E., & Ngugi, P. (2014).Influence of portfolio risk management on project success among commercial banks in Kenya. *International Journal of Social Sciences Management and Entrepreneurship*, 1 (3), 57- 75.
- Okoth, H. (2003). Corporate Risk Management: Costs and Benefits. *Global Finance Journal*, 13 (1), 29-38.

- Oditi, K. (2015). Effects of Risk Management Practices on Performance. *A case study in small scale business*. University of Nairobi, M.A Thesis (unpublished).
- PMI (2008). *Project Management Body of Knowledge (PMBOK Guide)* (4th ed.). Pennsylvania, USA: Project Management Institute Inc.
- Potts, M (2008). *Risk management, chaos theory and the corporate board of directors*. Paper Presented at Loyola University of Chicago academic conference themed "corporate boards: sources of risks, managers of risk.
- Project Management Institute (2013). A Guide to the Project Management Body of Knowledge (PMBOK) (5th ed.)*. Newton Square, PA: Project Management Institute.
- Project Management Institute. (2004). *A Guide to the Project Management Body of Knowledge*. 3rd Ed. Newtown Square, USA: Project Management Inc.
- Rahman M, Kumaraswamy M. (2002). "Risk management trends in the construction industry: moving towards joint risk management", *Engineering Construction and Architectural Management*, vol. 9, no. 2, pp. 131-151
- Roque, R. & de Carvalho, Y. (2013). Impact of project risk management, assessment of risks on project performance in Brazilian Vendor companies. *International Journal of Project Management*, Vol. 21 No 2, pp. 97-105.
- Ryan, G., & Bernard, H. R. (2000). *Data management and analysis methods*. Thousand Science, 185, 1124-1131.
- Serpella, A., Ferrada, X., Howard, R., & Rubio, L. (2013). *Risk management in construction projects: A knowledge-based approach*. *Social and Behavioral Sciences*, 119 (19), 653-662.
- Smith, N. (2006). *Managing risk in construction projects* (2nd ed.). London: Blackwell.

- Smith, N.J., Merna, T., & Jobbling P. (2006). *Managing Risk in Construction Projects*. 2nd edition. Oxford: Blackwell Publishing.
- Wachuru, S. (2013). The role of risk management practices in the successful performance of constituency development fund projects: A survey of Juja constituency Kiambu, Kenya. *International Journal of Academic Research in Business and Social Sciences*, 3 (7), 423-438.
- Wafula, G. P.(1986). *Building Contract Performance - A Case Study of Government Projects*. Moi University, M.A Thesis (unpublished).
- Winch, G., (2002). “*Managing construction projects, an information processing approach*”. Oxford: Blackwell Publishing.
- Zingrand, J. (2010). *What do network theory and endogenous risk theory have to say about the effects of central counterparties on systemic stability?* *Financial Stability Review*, 14 (7), 153- 159.
- Zulu, S., & Chileshe, N. (2008). *The impact of service quality on project performance: a case study of building maintenance services in Zambia*, in Proc. of the 3rd, Built Environment Conference, Association of Schools of Construction of Southern Africa, Cape Town, South Africa.

APPENDICES

APPENDIX 1: Introduction Letter

KENYATTA UNIVERSITY,

SCHOOL OF BUSINESS,

P.O BOX 43844-00100,

NAIROBI.

Dear Respondent,

RE: KIMANI PETER MACHARIA REG NO: D53/OL/CTY/32929/2015

This is to certify that the above-named person is a student at Kenyatta University pursuing Masters in Business Administration (MBA) specializing in Project Management. As part of this course, am expected to carry out a research on my specialization area. That why I intended to conduct a research on **Risk Management Strategies on the Performance of Construction projects in public secondary school in Murang'a County, Kenya.** Therefore, I humbly request your assistance and assistance. The information provided will be private and will only be utilized for examination purposes.

Thanks for your co-operation.

Yours Sincerely,

PETER MACHARIA

Appendix II: Questionnaires

The main objective of this questionnaire is to collect data that will be very useful in establishing the effects risk management strategies and performance of construction projects in public secondary schools in Murang'a County. The information you give will be private and confidential and will only be used for academic goals. Respond to every question by placing a tick (✓) where necessary. Do not write you're your name.

SECTION 1: Demographic Data

1. What is your position in the school?

Principal

BOM Chairperson

Accountant

SCEO

SCQASO

2. For how long have you worked in your position?

0-2 years

3-5 years

5-6 years

7-8 years

9-11 years

over 11 years

3. What is your gender?

Male

Female

4. What is your highest level of education?

Certificate

Diploma

PhD

Degree

Masters

SECTION B: Risk Management Strategies

Risk Avoidance strategy

This part seeks your opinion on how the school utilizes the strategy of avoiding any circumstance that may delay and lower quality of construction project. Please tick (✓) on one box on what extent you agree or disagree with the statements below.

		Strongly Agree	Agree	Neutral	Disagree	strongly Disagree
		5	4	3	2	1
5	The school has installed safety systems against any occurrences that may delay construction project					
6	The school advocates use of alternative plan or contingency plan to avoid any circumstances that result to project delay and poor quality.					
7	The school regularly inspects construction projects to ensure no issue arises that may cause project delay.					
8	The school encourages the use of detailed work plan to ensure that no event that will arise that may delay construction project.					
9	The school has a programme of training project team to ensure that project run within the schedule.					

Risk Reduction Strategy

This part seeks your opinion on how the school minimizes chances of occurrence of any circumstance that may delay and lower quality of construction project implemented by you.

Please tick (√) on one box on what extent you agree or disagree with the statements below.

		Strongly Agree	Agree	Neutral	Disagree	strongly Disagree
		5	4	3	2	1
10	The school holds crisis meeting regularly with project management team to identify and solve any issue that may cause project delay					
11	The school adopts quality assurance techniques to eliminate any situation that may cause the delay of the construction project.					
12	The school obeys signed agreements and contracts on issues that may affect duration and quality of construction projects.					
13	The school advocates use of alternative plan or contingency plan to avoid any circumstances that result to project delay and poor quality.					

Risk Transfer Strategy

This part seeks your opinion on how the school transfers any circumstance that may delay of the construction project to another party. Please tick (√) on one box on what extent you agree or disagree with the statements below.

		Strongly Agree	Agree	Neutral	Disagree	strongly Disagree
		5	4	3	2	1
14	The school purchases insurance premium on some of the construction items to ensure no circumstance will cause the delay of construction projects.					
15	The school signs legal agreements mostly to any event that may result in delaying the construction project.					
16	The school outsources those construction functions that may cause delay when performed by the project team.					

Risk retention strategy

This part seeks your opinion on how the school retains events that that may delay and lower quality of construction project as implemented by you. This is either because this event cannot be avoided or it is not beneficial to mitigate them because the cost of mitigating them is very high. Please tick (✓) on one box on what extent you agree or disagree with the statements below.

		Strongly Agree	Agree	Neutral	Disagree	strongly Disagree
		5	4	3	2	1
17	The school adopts self-insurance against any circumstances that may cause project delay					
18	The school advocates use of alternative plan or contingency plan to avoid any circumstances that result to project delay.					
19	The school sometimes takes no action to identified risks despite the fact that they may affect the duration of the construction project, as it is beneficial not to deal with them.					

SECTION C: Project Performance

This section contains statements related to the performance of construction projects in terms quality expected and meeting the schedule. Tick one box accordingly.

		Strongly Agree	Agree	Neutral	Disagree	strongly Disagree
		5	4	3	2	1
21	In my own point of view, risk avoidance leads to timely completion of construction projects.					
22	In my own point of view reduction of risk lead to the timely completion of projects.					
23	In my own point of view transferring risk to third-party lead to the timely completion of projects.					
24	In my own point of view, retention risk lead to timely completion of projects					
25	In my own opinion, I have successfully completed construction projects on time.					

26. In your own opinion, do you think risk management strategies improve project performance?

Yes No

27. In your opinion, what other factors affect the performance of construction project in your school?

i).....

ii).....

iii).....

iv).....

END

THANK YOU