

**CONTRACT MANAGEMENT PRACTICES AND COMPLETION OF ROAD
CONSTRUCTION PROJECTS BY THE COUNTY GOVERNMENT OF
MACHAKOS, KENYA**

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DECLARATION

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

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

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DEDICATION

I dedicate this research project to my family for their moral and financial support accorded to me during my studies. May God bless them all abundantly.

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I would like to acknowledge the efforts of my supervisor for the support and guidance while writing this research project. My appreciation goes to my college colleagues who also offered me encouragement and support during my studies. I give thanks To God Almighty for His mercy and good health and the spirit for enabling me write this project.

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ABBREVIATIONS AND ACRONYMS

CIPS	Chartered Institute of Purchasing and Supply
CM	Contract Management
CSC	Contract Selection Criteria
GNP	Gross National Product
HSSE	Health Security Safety and Environment
KPI	Key Performance Indicators
KURA	Kenya Urban Roads Authority
NACOSTI	National Council of Science and Technology
PSFs	Project Success Factors

OPERATIONAL DEFINITION OF TERMS

Contractor prequalification	Screening of construction contractors by project owners or their representatives according to a predetermined set of criteria deemed necessary for successful project performance
Contractors' payment practices	The approach in which construction products and services are priced and paid for.
Contract Change Management Practices	Alteration on conformance of contractor or supplier with contract terms, specifications, service level agreements
Contractor Supervision Activities	Monitoring and evaluating contractor performance
Contract Management	The process of systematically and efficiently managing contract creation, execution, and analysis for the purpose of maximizing financial and operational performance and minimizing risk
Project Completion	The degree of achievement of certain effort or undertaking which relates to the prescribed goals or objectives that form the project parameters
Construction projects	Involves coordination between separate enterprises and workers with varied responsibilities, skills and roles making the management complex

ABSTRACT

There has been poor performance of road contract due to diverse challenges such as poor management of funds and poor delivery of services to the road user. In addition, the performance measurement systems aren't efficient or effective to overcome this problem. Road contractor's performance problem appears in many aspects, ranging from fail in time performance, cost performance and others fail in other performance indicators. This study sought to establish and investigate the influence of contract management practices on the completion of road projects by the County Government. The specific objectives were the effect of contractor pre-qualification process, contractors' payment practices, contract change management practices and contractor supervision activities on the completion of road projects by the County Government of Machakos County. The completion of road projects was measured by time, cost, quality, accuracy and speed. The county government has a total population of 458 staff who were the target respondents of this study. Sampling was done using purposive sampling and stratified sampling to come up with a size of 145 respondents. Data were collected using questionnaires deployed using drop and pick method. Data were analyzed using descriptive techniques aided by SPSS software version 21. The regression analysis results showed that Prequalification, Contractors' payment practices, Contract Change Management and Supervision statistically explained completion of road construction in Machakos. All the independent variables were found to have a positive linear correlation with the performance of road construction. The findings of this research showed that the county government of Machakos was successful in implementing some of the key factors required for effective and timely completion of roads projects. Of the recommendations suggested in this study, the most crucial one is the emphasis of professional ethics in contract awarding, contract supervision and payment methods for continuing county contracts. From this study it was clear that corruption still needs to be addressed with serious and effective strategies that involve structural and social changes in approaching the vice. This study found out that contractor prequalification is an important aspect in predicting road completion. As was one of the significances of this study, the county government ought to emphasize on contractor prequalification documentation. Payment practices were found to have a strong linear correlation with completion of road project outcomes. This implies that if contractor services are not compensated within the pre-agreed time then road completion outcomes are bound to suffer. With that in mind, it is important that the county officials ensure timely and competitive payment packages that are also less bureaucratic. While contract change Management practices had a significant role in the completion of roads, its overall effect on the regression model was the least. However, the fact that contract Management practices is positively correlated with completion of roads projects at county level, it is imperative that county officials in charge of procurement stop premature contract termination and other contract management issues in order to encourage road completion.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Project management in the construction industry has been a key component in efficient and sustainable construction methods especially in developing countries. The area of construction industry is very important in the economic development of any nation especially in developing countries such as in expanding economy like in Sub Saharan countries (Ibironke, 2008). An efficient construction sector is a pre- requisite to operative national development since building civil and industrial engineering works are usually a major contributor to Gross Fixed Capital Formation, Gross Domestic Product and National Employment (Oyewobi & Ogunsemi, 2010). The concerns on performance of road construction and its effect on the economy continues to be a concern globally with more prominence in the developing countries of Africa and Asia. For the past two decades the growth of the Nigerian construction industry has indicated its success on the great contribution to the gross national product of the country, which was 1.72 as per 2007(Federal Bureau of Statistics). Aminudin (2006) indicated that up to 30% of construction is rework, labour being at only 40% to 60% of efficiency in potential and at least 10% of materials get wasted. It is suggested that rework costs could be ominously higher than figures reported in the previous literature (Love & Smith, 2006).

The road construction industry plays a major role towards the development and realization of goals in a society. Construction industry is among the major industries and adds to about 10% of the gross national product, in industrialized countries (Navon, 2005). There are numerous complexities associated with the construction

industries in its nature as it contains a large number of parties as consultants, clients, contractor's shareholders, stakeholders and regulators. Performance of the construction industry is normally affected by factors such as insufficient funds, shortage of foreign exchange, political priorities inappropriate contract conditions, poverty, withdrawal by donors, human capacity social-cultural conditions, corruption and occurrence of unexpected events for instance wars and draughts, are considered to be the major factors towards poor performance of the projects more so in the developing countries (Idoko, 2008), (Jekale, 2004), (Andersen, 2008). In many ways, the pace of the economic growth of a given nation can be measured by physical infrastructures development, for instance buildings, roads and bridges. The failure of any construction project is mainly related to the problems and failure in performance (Hough, 2007) Moreover, there are many reasons and factors that attribute to such problems.

The challenges facing the construction industry can be grouped. The performance problems of construction industries in developing economies can be categorized into three layers: problems of shortages or inadequacies in industry infrastructure especially in supply of resources, problems caused by clients and consultants and problems caused by contractor incompetence/inadequacies. Okuwoga (2008) identified that the performance problem is related to poor budgetary and time regulation. Long et al (2004) observed that the performance problems arise in large construction projects resultant to many reasons for instance: incompetent designers or contractors, poor estimation and change management, social and technological issues, site related issues and improper techniques and tools. Becerik (2004) stated that the main performance problem can be divided into two major groups: these are the

unrealistic target planning, setting or causes originating from the definite construction normally in most cases the problems arise from both.

It is significant that the Kenyan road construction projects history is marked by ups and downs with high performance by the national government being perceived today and a decade ago as apprehended in the succeeding empirical studies. The Kenyan construction industry has performed relatively well, not accidentally (Wels, 2007), amongst others. The dominance of small scale contractors is uttered by specific characteristics of the industry, for instance the wide dispersion of the flexibility in scale of production, demand, standardization of materials and climatic control on use of materials, of which some can be immense. Low quality capital demand for entry, more so for crafted-based jobs (Chan, 2001). This study sought to establish how the road construction and contract management practices are faring in the devolved system of governance.

There is always a need to measure performance of roads in a developing economy. The significance of recognizing road construction performance is apparent all over the world-wide markets, the results of which are to attract future investment, increase share value and attract high caliber employees (Kumaraswamy, 2009). Consequently, it is of importance to deliberate on how a performance of that nature is measured and how it can be communicated to the wider market, that is, how can it be comprehended and interpreted by the latent investors, customers and employees. The basis of expressing performance indicators that attain the latter have been in action as early as the beginning of our century, Creswell (2008). Equally, some of those

indicators have been evaded because as appraisals concentrate on finances Ibrinke (2008).

Good reputations of companies build by project success and also initiating new projects. The penalties may rather be in terms of productivity loss, surplus expenditures via means of repair and rework, retest in the short term and re-inspection. At the long term, deprived efficient can offend reputation. If the company continues with the same trend it might have to close its shop as well for want of new projects. When a number of construction companies start to neglect the efficient facets of their projects, they begin to reflect on the country's reputation (Hyvari, 2006). Assisting the construction companies to recognize the crucial aspects responsible for acquiring the desired efficient level success aspects and also to find the attributes unpleasantly affecting the project efficient, has been the motivating aspect behind this study. It is comprehended that intensification of the success factors and minimization of failure aspects ensure the construction industry realizes its efficient goals (Iyer and Jha, 2006). In Nyeri County, effectual construction projects can deliver a solid platform for reviving the economy and for building a more balance and self-determining economy during stable political conditions. In 2013, negligence of such services, systems and institutions, however, has affected the efficient of life of the residents and their environment and health (Kemps, 2012).

1.1.1 Completion of Projects

An effective project is delivered in time and has a right quality. There are several definitions, metrics, determinants and indicators of a complete project. A project is considered effective if the project is delivered on time, on schedule and acceptable

quality. Nonetheless, measuring project success is a composite task since success is tangible and can barely be agreed upon (Xiao & Proverbs, 2003). A comprehensive project is a product of complex series of activities that integrate skills and knowledge to produce a valuable result (Elger, 2008). Project completion has been well-defined as the degree of accomplishment of certain effort or activity which relays to the prearranged goals or objectives that form the project restraints (Ahmad, Ismail, Nasid, Rosli, Wan & Zainab, 2009).

Projects activities are blended by several factors. Timely activities of projects is a concoction of many important issues influencing cost accounting, repairs, quality control and maintenance, production management, supply chain, stores, safety and health (Amin, 2011). It is the completion of a project that enables achievement of the desired performance indicators in three key areas: scope, schedule and budget (Alvarado, Silverman & Wilson, 2005). A project is fruitful if it contents all three legs of the triple constraint, explicitly, specification/performance, cost and time, Greer (1999). Thomsett (2002) in an broad scrutiny of 20 failing projects over a period of 18 years extended this norms of success as: satisfies stakeholder groups, meets functional necessities, meets quality requirements and prospects, within cost and deadline, delivers continued and definite benefits and provides the team with skilled satisfaction and learning.

Performance dimensions may have one or more indicators, and could be influenced by various project characteristics. Completion of roads and determinants of performance of road contractors is complex issues just like are the factors militating against timely completion of road projects. This was corroborated by Kemps (2012) who described project delivery as the world's oldest documented profession with

challenges in project efficiency, road contractor's performance metrics and other contextual problem that appear in many aspects of road construction more so in developing countries. Most of the road projects fail in performance of time, others in cost performance whereas other fail in other performance indicators. There are additional indicators for problems of road contractor's performance in developing countries for instance project management, management between participants, feedback, and monitoring and leadership skills. In addition, cultural, economic and political issues are three vital indicators correlated to failures of road projects' performance in the Country (Becerik, 2007).

Contractors are major determinants of road completion projects. A feature of road Construction Firms in the developing countries is that, often they are thought to be one-man enterprises, having low capital and financial base and also lacking the necessary managerial skills to sufficiently face up to the many and problematic challenges they continually have to encounter in a distinctive developing economy such as Kenya's Bundi(2011). Despite the shortfalls, the contractors in the developing countries play a major role in the economy. It is contended that, given that these so-called small firms provide a structural base to the economy and also determine the productivity of investment and, accordingly, the rate of development in decentralized and rural areas of the economy, their evaluation of the factors influencing effective and efficient delivery of road construction projects would go a long way in helping to develop a useful framework for improving construction performance in the sector (Ganessan, 2003).

Reworks contribute to time and cost overruns in projects. There are diverse constraints to the completion of road construction projects as cited by Figueira(2010)

who described the main categories of constraints during construction process as reworks/repairs, defects, material allocation, unnecessary handling and waste of materials. Rework in construction projects is mentioned to as the unnecessary effort of rebuilding a process or activity that was erroneously applied in the first instance. Rework can result from an array of factors such as omissions, failures, errors, changes, poor coordination and communication and ultimately the profit margins as well.

1.1.2 Contract Management Practices

It is a common practice for organizations to involve contractors or suppliers in one way or another to support in providing service or product to meet its intended requirements in some form of contracts that require being managed (Kumar and Marqueset, 2007). Contract management can be summarized as the process of systematically and efficiently managing contract formation, implementation, and analysis for the purpose of exploiting financial and operational performance and minimizing risk. (Bhardwaj, 2011). Contract management practice is a continuous concept with many features. It refers the conformance of contractor or supplier with contract terms, specifications, service level agreements or Key Performance Indicators and other elements of the commercial agreement (CIPS, 2012). You cannot achieve completion of contracted projects without contract management practices in place. This is so because performance key outcome priority is cost, quality, speed and flexibility which also inform contract management (Ketchen and Hult, 2006).

Contractors should perform their obligations in a conducive environment. It is a major duty for operating company to ensure contractors perform their duties safely and timely through suitable contract management procedures (Hotteebex, 2013). Actually,

effective contract management has emerged as a crucial function to advance profitability, support acquiescence and manage risks (Prosidian consulting, 2011). Contract management has attracted attention because while some risks can be transferred to the contractor/sub-contractors in terms of financial compression for not finishing a project, the ultimate risk still lies with the operating organization to convey positive aftermaths which limit exposure to liability (Limberakis, 2012). Bautista and Ward (2009) commends that, the whole of procurement team should also be involved in managing the post award contracting activities.

Contract Administration processes and activities such as monitoring and measuring contractor performance, handling contract change and contractor payment process should be combined with other departmental essential processes such as financial management, customer service, schedule management, performance management and risk management (Hotterbeekx, 2013). Studies have shown that organizations that have established developed contract management processes are able to produce a great deal in surplus savings and have a distinctive competitive advantage over their competitors (Rendon, 2007). On the other hand, incompetent management of contracts eventually lead to poor operational control, high risks, low customer satisfaction and unwanted costs (Saxena, 2008). This study evaluated if this is the situation with road construction projects in the County of Machakos

1.1.3 Road Construction in Machakos County

Machakos County with a population of 1,084,129 million people has seen an unprecedented upsurge in road construction projects occasioned by the need to create enough office space as well as improvement of existing public road infrastructure to cater for the new devolved governments. This has seen the country commit up to 30%

of its budget to development, a big percentage of which is going to new roads. According to the governor of Machakos the county government has a determined master-plan that will ensure the face of the county lifted by the envisioned planned Machakos City that provided at attractive lease terms to develop housing to cater for Nairobi city and Konza techno city which is 15 Km from Machakos. Machakos is set to become the dormitory for those two cities and therefore there is certainly a high increase in roads construction activities (Machakos County report, 2013).

However, like any other part of the world Machakos County has had its own share of challenges in meeting the time deadlines of its construction projects. Indeed most of projects currently on-going have not been performing to expectations in terms of timeliness. Indeed most of the projects started in the last two years are way behind the set time schedules they were meant to be completed (Department of public works and Housing, 2014). Olatunji, (2010) avers that most projects are finally completed to specification more or less, although they are seldom on time. Cokins, (2006), Chai and Yusuf (2013), while stressing the importance of completing construction projects on time and within budget contends that “time is essence” and that time is “revenue”. This indicates that any delay in meeting the project completion time certainly interprets to loss of revenue.

The local studies haven't focused on factors influencing roads Construction Projects provision in Machakos County. Musa (2012) sort out a study on the effects of total quality management towards the performance of Companies in Kenya, a case study of the Inter build Company Limited. Musa (2012) found that resource management and human resource management affects performance of the building company to a great

magnitude. Bundi (2011) did a survey on encounters in the management of procurement facilities within the Kenya Urban Roads Authority. She found that political interventions and insufficient allocations of funds obstruct accomplishment of KURA activities although the authority fully implements procurement policies. Nyamwaro (2011) did a study on the analysis of encounters facing the project enactment a case study of Ministry of Roads Projects. The study comprehended that lack of awareness and poor communication on POA used in the enactment of the Ministry's Projects were the major challenges facing project implementation.

1.2 Statement of the Problem

According to government of Kenya (2012) the poor performance of the road contracts is due to poor management of funds and poor delivery of services to the road user. In addition, the performance measurement systems aren't efficient or effective to overcome this problem. Road contractor's performance problem appears in many aspects, ranging from fail in time performance, cost performance and others fail in other performance indicators. Ugwa and Haupt (2007). The performance and completion of road construction projects is littered by cases of impairing challenges mostly attributed to construction contractors. In the past, many road projects were completed with poor performance as a resultant of many contractors motives for instance: non-availability of materials, obstacles by client , roads closure, amendment of the drawing and design, additional works, waiting the decision, variation order, handing over, changes in Bill of Quantity and delay of getting the drawings Garel(2004). Nonetheless, the overall situation on the state of road construction contract management and their efficacy was captured by an empirical study conducted on the same subject in Nigeria which established that corruption in the contract

management practices by the government in the developing world resulting in poor workmanship by contractors and engineers (Okuwoga & Adeyinka, 2008).

This has been reinforced by studies in the Kenyan construction industry that have made findings to the effect that cost overrun, delayed completion period, conflicts in the complicated vendor relationship, poor contract management practices, extortion and bribery, poor risk mitigation and poor quality work are the norm rather than exception in the undertaking of contracted construction projects (Kibuchi and Muchungu, 2012; Cleland and Bidanda, 2009; Lepartobiko, 2012; Chuah et al., 2010). With a dearth of studies on the effects of contract management practices on the completion of road projects, this study not only sought to fill the gap but, establishes the contract management practices by the nascent county government with reference to Machakos County.

1.3 Research Objectives

The following are the general and specific research objectives of this study.

1.3.1 General Objective

The study sought to investigate the effects of contract management practices on the completion of road projects by the County Government of Machakos.

1.3.2 Specific Objectives

- i. To determine the role of contractors' pre-qualification process on the completion of road projects by the County Government of Machakos, Kenya

- ii. To find out the role of contractors' payment practices on the completion of road projects by the County Government of Machakos, Kenya
- iii. To assess the influence of contract-change management practices on the completion of road projects by the County Government of Machakos, Kenya
- iv. To determine the effects of contractors' supervision activities on the completion of road projects by the County Government of Machakos, Kenya

1.3.3 Research Questions

Of particular interest to this study were answers to the research questions;

- i) How does contractor pre-qualification process affect the completion of road projects by the County Government of Machakos, Kenya?
- ii) How do contractors' payment practices affect the completion of road projects by the County Government of Machakos, Kenya?
- iii) Which is the effect of contract change management practices on the completion of road projects by the County Government of Machakos, Kenya?
- iv) Which is the effect of contractor supervision activities on the completion of road projects by the County Government of Machakos, Kenya?

1.4 Significance of the Study

The study findings and recommendations are helpful to many parties. The management of County Government of Machakos may gain insights on the major effects of contract management practices on completion of road projects and take necessary measures to ensure timely completion. The project also helps the

government understand the challenges and the needed critical success factors in order to boost project completion rates and increase the number of customers, revenues and profitability. The general public, who are the beneficiaries of the projects are likely to get nuanced details and challenges affecting the construction of roads of in this county. This study provides reference point to future researchers and academicians in the area of construction and factors affecting completion of projects.

1.5 Scope of the Study

Due to development efforts road construction in the County of Machakos was selected. Only tarmacked roads were considered that were constructed under the commissioning of the county government of Machakos. The respondents to the study were the county government officials with knowledge on contract management practices by the County government and completion of road projects by virtue of the positions they occupy in the county government. The investigation of effects of contract management practices on completion of road projects were limited to the study variables contract prequalification process, contractors' payment practices, contract change management practices and contractor supervision activities. Other factors that affect both the construction of roads and contract management practices were not investigated.

1.6 Limitations of the Study

Challenges and limitations in data collection were faced in course of the research since most of the relevant information required is usually protected due to its sensitive nature. The researcher used an introductory letter from the university as well as assuring the respondents that the information cannot be used for any other purpose

apart from the study. Most of the respondents might be expected to be busy executives who might not have the time to respond to the research instruments in an instance and so the study adopted a drop and pick method of collecting data using questionnaires with a follow up visit in between to increase the response rate.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter contains a review of literature arranged as follows; theoretical review in a framework that outlines the theories to guide the study, an empirical review based on study variables, a conceptual framework outlining the graphic relationship between variables and a summary of literature review that expose gaps to be filled by the study.

2.2 Theoretical Review

2.2.1 Critical Chain Project Management Theory

This study was based on the Critical chain project management theory. It is named after the crucial element; the extended chain of dependent resourced errands in the project. The goal of the solution is to safeguard the period or rather the duration of the project, and thus completion date, beside the effects of individual task resource and structural dependency, variation, and uncertainty. The road construction projects by County Government are afflicted by this structural, resource dependence on principal and variation constrains making this theory ideal.

The outcome is a vigorous and reliable approach that permits teams to accomplish projects on due time, every time, and most significantly within at most 75% of the current period for single projects and much less for individual projects in multi-project environments. The shorter period provides a genuine chance in the marketplace to distinguish from competitors who deliver worse outcomes, and late at that, through other methods of project management. It also offers an opportunity to

deliver additional projects over all, in the same extent of time, and at no escalation in operating expense, therefore significantly refining the bottom line (Youngman, 2009).

2.2.2 Principal-Agency Theory

According to Chiappori and Salanie (2003) as cited by Salim (2013); and Oluka and Basheka (2012) the underlying principle of the principal-agency theory is that there should be a clear understanding of the needs of the principal and ability of the agent to meet these needs to reinforce desired performance (Ketchen and Hult, 2006). This is the expected arrangement between County Government and the multitude of contractors engaged in the Government construction value chains.

Indeed, when procurement contract is well defined and planned, the principal and agents find it easy to meet needs of each other in an effectual way resulting to timely implementation of the contract (Oluka and Basheka, 2012). The principal-agent theory can proudly be applied to this study with a case as a principal and contractors or service providers or suppliers as agents. The theory becomes significant to the study as it highlights the need for robust contract requirements and specifications as well as the objective process of monitoring contractors' performance. When contract requirements roles and responsibilities are well defined, the agents and principals find it easy to meet needs of each other in a more effective way resulting to timely execution of the contract in determined performance level.

2.2.3 Bureaucratic Approach Theory

This theory was propounded by Marx Weber in 1947 in order to explain the happenstance in formal organizations that invariably have bureaucracy a necessary

evil. Weber's bureaucratic approach which considers the organization as a portion of the wide society based on principles for instance specialization, structure, stability/predictability, democratic and rationality is seen here as the most significant and practical model to this study. Weber listed various preconditions for the occurrence of bureaucracy. These include the growth in population and space being ran, and the convolution growth of administrative tasks being carried out and the existence of a financial economy resulting in a necessity for a more effective administrative system.

Development of communication and technologies has made more efficient administration possible but also the rationalization and democratization of culture resulted in demands that the new system delights everyone equally (Weber, 1947). Weber's supreme bureaucracy is categorized by hierarchical organization with defined lines of authority in a stable area of activity, inaction taken on the grounds of unrecorded and written rules, bureaucratic representatives demanding expert training, rules executed by neutral officials and carrier development depending on technical recommendations. In large organizations, and under well distinct conditions, the organizational structure may be bureaucratic. The crucial elements of a bureaucratic organization include the use of standard procedures and methods for performing work and high degree of control to safeguard standard performance.

In agreement with Weber, Mintzberg (1981) identified two types of bureaucracies. They are standard and professional bureaucracies. The standard bureaucracy is grounded on efficient enactment of routine work. Professional bureaucracy is dependent upon effective performance of standardized, however complex works that

entails high levels of specialized skills. The standard bureaucracy structure is based on functions, span of control and specialization. According to Luthens (1986), each organization structure contains both de-centralization and centralization. The modern organizational structures show quite a strong propensity to decentralization. While identifying bureaucracy as the most effective form of organization, and even crucial for the modern state, Weber, nonetheless saw it's weakness being impersonal, rigid, self-perpetuating and empire building, dislocation of objectives, cost of controls, and concern to improve status (Hicks and Gullet, 1975).

Subsequent to the above faults of the bureaucratic theory, modern theories are thus preferred. In modern theory, an organization is defined as a structured and designed process in which individuals interact for objectives (Hicks and gullet, 1975). The modern approach to the organization is multi-disciplinary as several scientists from diverse fields have funded to its development stressing on the dynamic nature of communication and importance of integrating the individual and organizational interests. The structure of this study evaluates the role of both the County Government and the contractors in their roles on completions of projects as defined by the study variables. This theory is significant in assessing the extent to which County Government has cut the red tape and adjusted the bureaucratic formalize tall structure into a matrix project structure not only to accommodate the interests of the contractors but also hasten completion of projects. The theory is important in assessing the efficiency of County Government in undertaking its contract management duties like site visits, pre-qualification, supplier relations, stores management and appraisal and payment of contractors.

2.3 Empirical Literature

Empirical literature is organized according to the study objectives as show below;

2.3.1 Completion of Projects

A successful road construction project is measured by timely completion of projects. The completion of road construction projects in a timely manner is often a critical factor and measure of project success. In the recent years, there has been a growing interest in the use of projects as the building blocks in strategic management of organizations (Weiss & Potts, 2012). The achievement of any road construction project is highly reliant on its completion time from start to delivery of results. This has a straight or rather bearing on management decisions for instance budgets, targets and standards (Seddon, 2008). There is available proof from literature on ways to use projects for the controlling of organizational process to organize the organization for its competitive survival and future (Cleland& Ireland, 2007). Today, project management techniques are basically used as the principal means by which strategic and operational issues are managed.

Outsourcing leads to effective service delivery. Adoption of outsourcing and subsequent contract management activities were meant to enable effective service delivery which refers to producing work that is of high quality and recognized as efficient (Cole, 2002). The long-term objective of any organization is to produce high quality road construction projects measured against the traditional measures of time, cost and scope (Basu, 2014). There are different dimensions of measuring the success of completed road construction projects. Road construction project success is measured by time, cost and quality. Cookie and Davies (2002) distinguishes between

project management success and project success (measured against the objectives of the project). He further distinguishes success criteria as the measures against which success or failure of a project is measured while success factors are the inputs that lead either directly or indirectly to the success of the project.

Construction works involve high daily expenses that can't be met by the contractors when progress payments by the owners are delayed. Hasseb et al., (2011) noted that a road construction project's success depends on meeting objectives within time and budget limits. As a result of this, there are several road construction projects that are delivered within time and budget but fail to meet the expectations of end users. Equally, the challenge of timely road construction project delivery can take multiple dimensions depending on the road construction project's environment. In Ghana, Frimpong et al., (2003) identified five factors as the major causes of delays to road construction projects. These include monthly payment difficulties to contractors, material procurement difficulties, poor contract management, poor technical performance and material price rises.

Delay in road construction project completion time can be caused by several problems. Poor specialized management, rising cost of materials, fluctuation of prices and poor site management have also been recognized as factors triggering a delay in road construction project completion time. In order to anticipate the encounter of timely road construction project delivery, Samuel (2008) endorses that project time management be an important or rather key priority for the contractors and that the nomination of a registered project manager for each contract should be a compulsory condition of qualification, track record, past assignments, endorsement and capacity

in the tendering process. Delays in road construction projects can be avoided by use of effective contract management. The major challenges impeding completion of road construction projects can be resolved through the use of effective contract management because they are basically human, materials and logistics trinity.

According to Frimpong et al., (2003) major delay occur during road construction project implementation stage, therefore factors like poor contractor management, monthly payment difficulties, poor technical performances material procurement and escalation of material prices donated during construction of groundwater road construction projects in developing countries. In most of Kenyans construction setting, delays. In completion of road construction projects are widespread more so due to poor reporting structures and prevalent corruption (DFID, 2013). This study built on these past studies by examining the role of contract management in completion of construction road construction projects.

2.3.2 Contract Prequalification Process

Contract initiation activities have many activities. Rendon (2010) explained that at pre – qualification phase, there should be preparation of workforce, clear processes of engagement, relationships building, resource allocation to road construction projects, leadership and policies all of which have direct impact on resulting contractors' performance outcomes. The contract creation activities set up the performance expectations for the road construction project. According to business dictionary, Performance is the achievement of a given task measured against the present known standards of accuracy, completeness, cost, and speed. In contract, performance is thought to be the contentment of requirement in a manner that releases the performer from all liabilities under the contract. It refers the conformance of contractor or

supplier with contract terms, specifications, service level agreements or Key Performance Indicators (KPI) and other elements of the commercial agreement (CIPS, 2012). Performance key outcome priority is cost, quality, speed and flexibility (Ketchen and Hult, 2006). According to BG Group (2014) Contractor performance management include the following areas: Health Security Safety and Environment (HSSE); Operations; Quality; Delivery; Payment; Receipt; Expediting and inspection.

Prequalification is defined as the screening of construction contractors by road construction project owners. Quite interesting are the criteria presented by the Palaneeswaran and Kumaraswamy (2001). The following groups of criteria have been suggested: Responsiveness, promptness, realism, completeness, Meeting deadlines, correctness and valid information, totality in providing information, Responsibility, obeying the law and complying with local government regulations, standards and bylaws, quality system, safety system and Competence, resource (financial, machinery, plant and equipment, human resources), experience, constraints (current workload, subcontracts, guarantees).

Prequalification systems seek to decrease construction road construction project threats. Prichard (2000) offers that prequalification systems allow contractors and clients to focus on the tendering process than be weighed down by issues of competence and suitability. Nonetheless, previous research has tended to focus more on process than people. Prequalification is often viewed in client terms. However, it would be worthwhile for clients to consider the perspective of other stakeholders. Holt and Jennings (1998), Mills (2005) and Minchin and Smith (2001) research moved away from concentrating on client perspectives without acknowledging

contractor sentimentality. Criteria can be followed in selection of contractors. Mills (2005) found that the apparent importance of various selection criteria between contractor and client diverges greatly. Furthermore, Ng, Skitmore and Smith (1999) found that several consultants' perceptions of which selection criteria were significant differed ominously to each other and the client. As such, industry stakeholders were shown to think contrarily in respect to the significance of various selection criteria. This variety of thought should be valued. It also suggests that industry people originating from different disciplines are possibly biased towards their own objectives. Broader stakeholder involvement allows for a greater understanding of prequalification systems and how they affect people.

Prequalification systems affect competition in the marketplace. Li, Foulger, and Phillips (2008) suggest that prequalification can limit the number of available tenderers creating reduced competitive behavior from those invited to tender. Prequalification systems need to appeal to capable contractors particularly in boom times. Ngai, Drew, Lo and Skitmore (2002) say the two prime factors affecting the degree of competition are the number of contractors able to tender a road construction project and market conditions at the time. Larger contractors felt that prequalification systems with stringent multi-criteria selection decision making improves their chances of winning contracts. However they did also find that contractors are generally dissatisfied with prequalification possibly leading to Minchin and Smith (2001) assertion that there are good contractors who elect not to participate.

2.3.3 Contractors' Payment Practices

A growing number of incomplete road construction projects have led many to pose many questions as to what is behind the failure in providing such an extremely needed commodity. One may wonder whether such a failure is in anyway concerned with architecture, practices and attitudes of the people or is it just a thing to be attached on socio-economic platform of the society that is cost escalation and unethical practices by players (Mirema & Mhando, 2005). Road construction projects should be finalized within estimated budget. Abdullah, Aftab, Azis & Rahman, (2010) examined that construction cost is one of the most important criteria of success of road construction projects throughout the maturation of the road construction project and is of high apprehension to those who take part in the construction industry. In order to successfully manage construction project, various procurement strategies have been presented.

Maintaining a steady cost forecast on construction projects had been implemented until recently an issue of severe concern, both to the client and project contractors. Amusan, (2010) reported that cost deviation from initial cost plan, had been prevalent on construction sites. Every year, large companies spend large sums on the research and development about the most optimal amalgamation of production or the most favorable function and feature of their products and services. Amin, (2011) examined that the impact of poor quality on the price of products and organization earnings and the expanse of cost should be paid for high quality has elevated many important issues influencing quality control, cost accounting, repairs and maintenance, supply chain, stores, production management, safety and health, improvement on cost and education .

It is always necessary to define ways and processes in the contract to penalize or award on the basis of compliance with the agreement. Choy, Chow, Lee and Chan (2007) state that conflicts regarding payments hinders an organization from practicing proper contract management. It is significant to devise ways of measuring progress and set actual acceptance standards. A study by Njie *et al.* (2005) reviews relevant literature and recognizes several pricing and payment schemes used in the global building industry. This research road construction project assumes payment systems to refer to the method in which construction products and services are priced and paid for. Standard forms of contracts for building works frequently require the client to make intermittent payment of the sum agreed with the contractor. It is the principles behind these contracts with respect to their tender/pricing and payment processes. Njie *et al.* (2005) demonstrates the most common standard forms of building contracts with their related existing payment systems. The original payment systems such as the incentive contracting, stage payments, trust funds/accounts, direct payment, mobilization advance payment and the mechanic's lien can be used with any contracting system. Ordinary forms for civil engineering projects, notably the FIDIC and ICE, use the same payment systems as their equivalent JCT contracts.

2.3.4 Contract Change Management Practices

Contract termination can either be at maturation or prematurely. Some of the premature causes of contract terminations are anticipated in contracts like poor quality works, health and safety incidents and late completion of works (Nassar & Salim 2013; Mturi 2013; Mkose 2012). On other hand, some members of the CM team especially the end users, have not been taking ownership of the contract as the result no control of cost, late invoice payments for service delivered/completed, which

causes cost overrun and complains to contractors which could affect the relationship and contractor's performance. It has cited that the threat of contract termination significantly improves the completion of road construction projects (Hassan, 2009).

There is a growing body of knowledge emphasizing the presence of contract termination clauses in construction for diverse reasons. According to study by Grimsey and Lewis (2004) contract termination clauses can be defined as the processes undertaken to maintain the integrity of the contract, and ensure that the roles and responsibilities contractually demarcated are fully understood and carried out to the contracted standard. Termination is the process that ensures that process that safeguards that all involved parties to a contract fully meet their responsibilities, in order to satisfy the strategic business goals and the operational objectives of the contract of the customer (Weele and Puil, 2013).

Premature contract termination has gained frequency and traction in the construction industry and several mitigating measures have been suggested. According to a study by Bhardwaj (2011), contract terminations can be avoided if both parties to a contract do not fail to meet their obligations in order to convey the objectives obligatory from the contract and are allowed to do so by the other party. It also involves building a good working relationship between company and contractor. It continues throughout the life of a contract and entails managing proactively to anticipate future needs as well as reacting to situations that rises. Rendon (2010) observes that the greatest guard against contract termination by the contractor should be availing of qualified workforce, clear processes, resources, relationships policies and leadership all of which have direct impact on resulting contractors' performance outcomes.

Effective change management process has to look into the cost, time and quality considerations for the road construction project. According to Zhao,Lv,Zuoand Zilante (2009) contract change management is one of the project management practice that determine problems when change occurred in a road construction project or lessen change that may occur and upset the movement of the road construction project. Also Hwang and Low (2012) outlined the process of change management to encompass of four indispensable principles to identify changes, to evaluate changes, to implement changes and to learn from past experiences. In other words a change management process should seek to anticipate possible change, identify change that is before now occurred, arrange for preemptive measure and synchronize changes across the entire project stakeholders, which can be achieve by an integrated solution for coordinating everything involved for the purpose of the change.

Contractor's management capability has a positive effect on successful road construction projects. Aje, Odusami and Ogunsemi (2009) showed that contractors' management capability has significant impact on cost and time performance of building projects. Wiguna and Scott (2005) showed the critical risks affecting both project time and cost perceived by the building contractors were related. They were: high increased/inflation material price, design change by owner, weather conditions, defective design, delayed payments on contracts and defective construction work. Regarding to time delays the most important causative factor for global road construction projects was late delay in payments while for the stadia road construction projects design-related factors caused the most delays (Baloyi & Bekker, 2011). Iyagba (2010) identified the factors that contribute substantial negative effect to road

construction project performance, hence affecting the integrity of the construction industry.

2.3.5 Contractor Supervision Activities

Performance pointers measure and evaluate success against a specific goal. No contract arrangement can guarantee a problem free in road construction project execution; it is the quality of the people, management system of the company and contractor that are the best guarantor of success according to a study by (Bhardwaj, 2011). These need to be continuously monitored and evaluated. Key performance indicators are used to track and evaluate the Contractor's performance in conforming to the contract requirements. The process begins by selecting performance indicators that are relevant for the procurement environment. This is followed by identifying and collecting appropriate data for each performance indicator to establish a baseline on the level of performance (Path, 2012).

A range of performance indicators can be developed to monitor a contractors' performance, and the particular indicators used differ in accordance to the contract specifications, the level of risk associated with contract failure by the supplier, and the worth of the procurement (Path, 2002). This has been supported by Miller (2005) who observes that, just because everything can be measured doesn't mean that everything has to be measured. Performance measurement entails the measuring of the right things for the right people at the right time. It's about measuring what's significant to the business. It's about the quality of the measures and not the quantity (Miller, 2005).

Building road construction projects are the fundamental factors influencing contractor performance. Hatami and Behsan (2012) found that contractors are more compliant of

risks that are mentioned in contracts than of other types of risk. Contractor performance is focusing on the characteristics of each road construction project, the contractor's degree of participation, and how that influences contractor performance. Abbasnejad and Moud (2013) found that most road construction projects writhed from delays, imposing major damage on contractors, and that these damages were intolerable and deeply influenced the contractor performance, which has been found to vary among nations for a long time.

2.4 Summary of Literature Review and Gaps

Based on local studies that have been done in Kenya; most of them did not focus on key performance indicators of construction projects in Kenya. Nyangilo (2012) did a research on an assessment of the organization structure and leadership effects on construction projects' performance in Kenya. Lepartobiko (2012) studied the factors that influence success in large construction projects. Kigari and Wainaina, studied emerging trends in economics and management sciences time and cost overruns in power projects in Kenya by closely relating the factors to the various variables. From these studies there is no a guideline for the contractors who want to correct their previous mistakes and improve on their current situation. Therefore, this research focused on key performance indicators of construction projects in Nairobi Central Business District which shall be used as a benchmarking for the contractors. Kibuchi and Muchungu (2012) studied the involvement of human factors in the performance of construction projects in Kenya. Nyangilo (2012) did a research on an assessment of the organization structure and leadership effects on construction projects' performance in Kenya. Lepartobiko (2012) studied the factors that influence success in large construction projects. From these studies that have been done on performance of construction projects, there is a need for future studies to focus on the following areas:

The effects of construction project manager's skills on projects performance. Find out between public and private construction projects, which one has got higher performance level. It is also recommended to develop modelling system and performance measurement framework in order to measure performance of construction organizations and projects. In addition, it is recommended to study and evaluate the most important factors as a case study of construction projects in Nairobi.

2.5 Conceptual Framework

The schematic diagram below represents the diagrammatic representation of the relationship between the study variable

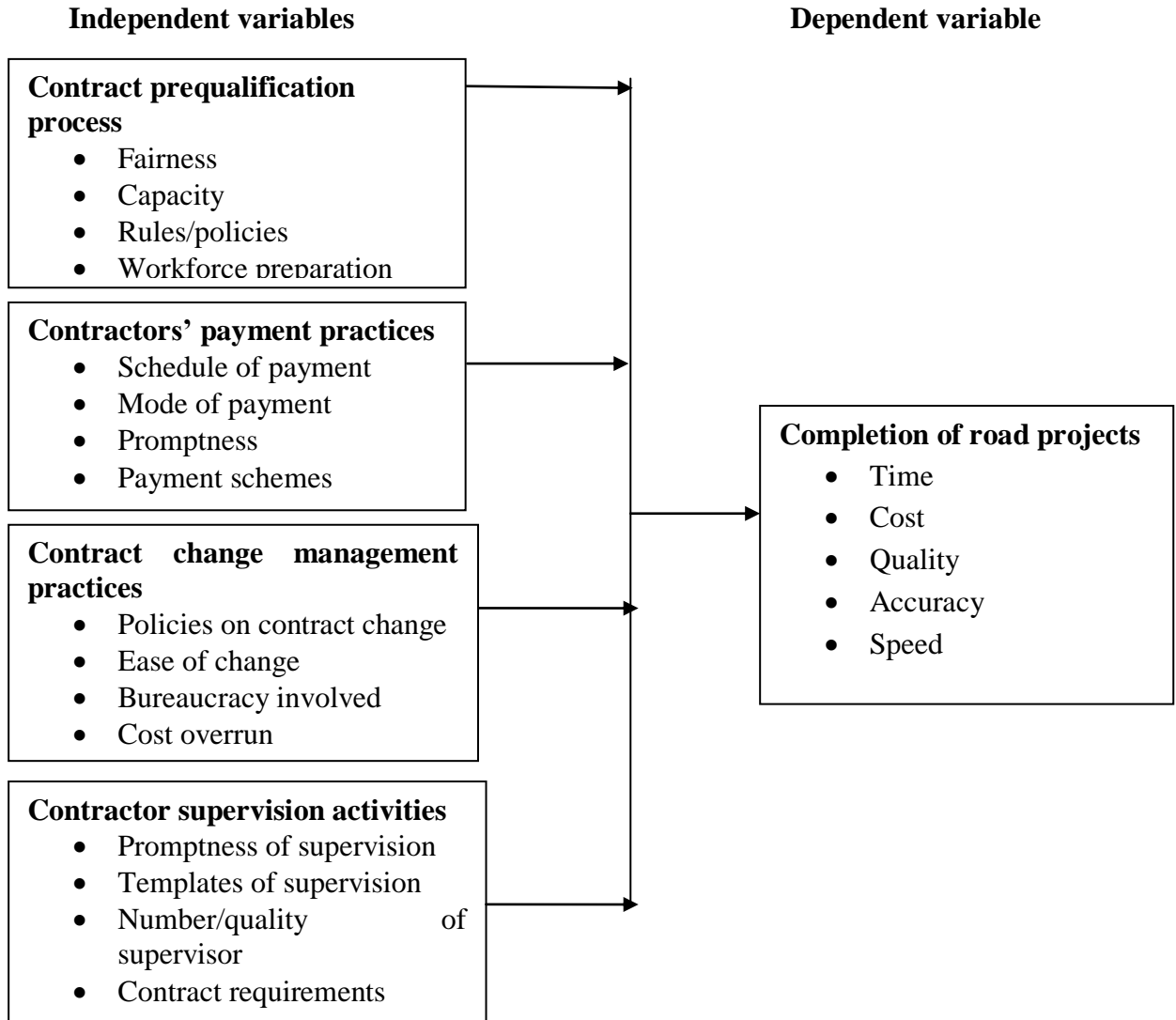


Figure 2.1; Conceptual framework Source: Researcher (2016)

CHAPTER THREE

RESEARCH METHODOGY

3.1 Introduction

The study sought to assess the effects of contract management practices on the completion of road construction projects by the county government of Machakos, Kenya. This chapter provides a framework of methodology that be used in the study. It gives an insight into the research design, target population, sample size, data collection instruments and procedures, data analysis and presentation.

3.2 Research Design

A research design is a proclamation of the essential elements of a study and constitutes the blue-print for the collection, measurement and data analysis (Cooper & Schindler, 2008) hence a logical and systematic plan prepared for directing a research study (Shajahan, 2005). The study adopted a descriptive survey design. Sekran (2007) observed that descriptive survey research is projected to produce statistical information about aspects of a phenomenal being studied by running a questionnaire to a sample of individuals. The descriptive design was particularly ideal because all the data on the indicators of contract management practices and completion of road construction projects was in numerical form suitable for quantitative description. The likert scale that was utilized provided quantitative data that was analyzed in a quantitative manner.

Descriptive surveys are designed to obtain information about the current status of a phenomenon or to answer questions like where, what, how, why, when, and who. The study used descriptive research which refers to the investigation in which data is

collected and analyzed in order to describe the specific phenomena in its current trends, current events and linkages between different factors at the current time (Kothari, 2004). Descriptive research design was used because it enables the researcher to generalize the findings to a larger population. The design not only enables the description of activities that delay the completion of road construction projects by the county government of Machakos, Kenya but also describe the exact phases and processes affected by the process.

3.3 Target Population

A population or universe for a study is any group of persons or institutions which have one or more characteristics in common that are of interest to the researcher (Saunders, 2008). The study was conducted in the area administratively delineated as Machakos County. The study was conducted in the Machakos County because of rapid urbanization, industrial activities and high population density. This enabled gathering of comprehensive information needed by the study. The staff of county government in the management cadre and with knowledge due to their work experience on the completion of road construction projects forms the focus of this study. The respondents included the staff of the County government. There are 458 members of staff in the management cadre of Machakos (Human Resources Department, 2016).

3.4 Sampling Techniques and Sample size

The following sampling techniques and sample size were used;

3.4.1 Sampling Techniques

In the selection of respondents to the research instruments, the researcher intends to use stratified sampling and simple random sampling techniques. Stratified sampling ensures that all categories of the study case are included in the sample (Kothari, 2004). Stratified sampling was used to ensure that officials from all the departments in the county government that have a direct impact on completion of road construction projects are included in the sample. This ensured that some comprehensive data on the effects of contract management practices on the completion of road construction projects by the county government of Machakos, Kenya is collected with respondents equitably represented from all the departments of the County government. Stratified sampling ensured that members of staff from the projects department, finance department, monitoring and evaluation department and quality assurance department of the County government were represented in the sample. After the stratification, simple random sampling based on the first letter on the names of the officials was used to ensure objectivity and equal opportunity for participation in the study (Nondu, 2010). Simple random sampling was used to ensure that all the members of staff have an equal chance of participating in the study.

3.4.2 Sampling Frame and Sample Size

inition also encompasses the purpose of sampling frames, which is to provide a means for choosing the particular members of the target population that are to be interviewed in the survey. More than one set of materials may be necessary and this is generally the case in a multiple survey with a multi-stage nature. Upagade and Shende (2012) also refers to a sampling frame as a source list containing all names of the universe. Specifying the sample frame is crucial as it itemizes all items in the population from which a sample is obtained for analysis so as to test the research hypotheses. The

sample for this study was of size 145 respondents. The sample size represents a threshold of 30% of the population to enable their statistical representation in the sample as advised by Mugenda & Mugenda (2003).

Table 3.1: Sampling Frame

Designation	Sample Size
Project managers	12
Project Engineers	21
Designing engineers	25
Construction engineers	28
Finance officers	18
Operations and Maintenance Officers	13
Compliance officers	15
Procurement officers	10
Store officers	11
TOTAL	137

3.5 Data Collection Procedure

Data was collected using interview schedules and questionnaires which was delivered to each of the Respondents. The questionnaire were ideal just as they were appraised by Orodho (2009) who defined a questionnaire as an instrument used to gather data, which allows a measurement for or against a particular viewpoint. He emphasizes that a questionnaire has the capability to collect a bulky amount of information in a reasonably quick space of time. Questionnaires are easy to administer, gives the respondent sufficient time to arrive at a well thought response and are free from the researcher's bias. The drop and pick method was used where the respondent is very busy or not available. Interview schedules were administered to key staff in departments such as legal department, compliance departments and procurement departments to enable the researcher to collect even the detailed and qualitative data that would be difficult to collect using questionnaires.

3.6 Validity of Instruments

Face and content validity were administered on the questionnaires. Kothari (2004) points out that validity is the degree to which a test measures what it is supposed to measure. After piloting the questionnaires were edited to ensure that it measures up to high degree of face and content validity. Additionally, the expert opinions of the project supervisor further refined the validity of the instrument.

3.7 Reliability of Instruments

Reliability is the level of internal steadiness or stability of the measuring device over time. According to Orodho (2009) reliability is the ability of a research instrument to steadily induce the same responses from respondents in a study. The ultimate initiative in ensuring reliability is to providing simple and clear instructions to the respondents. A pilot study was carried out to correct any mistakes in the measuring tool. After the pilot study, the instruments were edited to eliminate inconsistencies, ambiguities and other grey areas that might hinder the consistency of responses from the instruments among the many respondents. Cronbach alpha co-efficient was used to determine the reliability of the research instrument with a co-efficient of 0.8 deemed sufficient.

3.8 Data Analysis Procedure and Presentation

Zikmund (2003), define data analysis the whole process which starts immediately after data collection and at the point of interpretation of results. It involves coding, classifying, analyzing as well as editing gathered data to ensure completeness and accuracy. Quantitative approach to data analysis was employed in data analysis. Primary data from the questionnaire was coded and entered into the computer for

computation of descriptive statistics which was analyzed with the support of Statistical Package for Social Sciences (SPSS) version 20.

The descriptive analysis yielded tables, charts, mean and standard deviation to describe the data and enable making of meaning from the data. Additional analysis was conducted using a multiple linear regression analysis which enabled establishment of the exact strength of the association among the variables under study. The model for the multiple regression analysis was as follows;

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

Where,

Y = Completion of roads project

X₁ = Contract prequalification process

X₂ = Contractors payment practices

X₃ = Contract change management

X₄ = Contractor supervision activities

ε = Error term

Since both quantitative and qualitative data were collected and analyzed, quantitative data was presented using tables, charts, and bar graphs and written discussions. Data were presented in tables, charts, graphs and any other appropriate presentation method.

3.9 Operationalization of the Variables

Table 3.2; Operational Definition of Variables

Objectives of the Study	Variables	Indicators	Measurement Scales	Type of analysis	Tools of Analysis
To determine the role of contractors' pre-qualification process on the completion of road projects by the County Government of Machakos, Kenya	Contract Prequalification Process	<ul style="list-style-type: none"> • Fairness • Capacity • Rules/Policies • Workforce Preparation 	Interval Measurement Scale	Descriptive Analysis	-Frequency Distribution -Means -Standard Deviations
				Inferential Statistics	Regression Analysis
To find out the role of contractors' payment practices on the completion of road projects by the County Government of Machakos, Kenya	Contractors' Payment Practices	<ul style="list-style-type: none"> • Schedule of Payment • Mode of Payment • Promptness • Payment Schemes 	Interval Measurement Scale	Descriptive Analysis	-Frequency Distribution -Means -Standard Deviations
				Inferential Statistics	Regression Analysis
To assess the influence of contract-change management practices on the completion of road projects by the County Government of Machakos, Kenya	Contract Change Management Practices	<ul style="list-style-type: none"> • Policies on Contract Management • Ease of Change • Bureaucracy Involved • Cost Overrun 	Interval Measurement Scale	Descriptive Analysis	-Frequency Distribution -Means -Standard Deviations
				Inferential Statistics	Regression Analysis

To determine the effects of contractors' supervision activities on the completion of road projects by the County Government of Machakos, Kenya	Contractors' Supervision Activities	<ul style="list-style-type: none"> • Promptness of Supervision • Templates of supervision • Number/quality of supervisors • Contract requirements 	Interval Measurement Scale	Descriptive Analysis	-Frequency Distribution -Means -Standard Deviations -Correlation Analysis
				Inferential Statistics	Regression Analysis
	Completion of Road Projects	<ul style="list-style-type: none"> • Time • Cost • Quality • Accuracy • Speed 	Interval Measurement Scale	Descriptive Analysis	-Frequency Distribution -Means -Standard Deviations
				Inferential Statistics	Regression Analysis

3.10 Ethical Considerations

For the purpose of this study, approval was sought from Kenyatta University and a letter granted by the National Council of Science and technology (NACOSTI) to allow the researcher to carry out the research. The researcher further sought approval from the management of county government where the officials are concerned to carry out the study. The researcher explained the purpose of the study to the respondents and assured them of confidentiality of their responses and identities. The researcher adhered to appropriate behavior in relation to the right of the respondents to voluntarily participate in the study. A verbal consent was sought from the respondents before questionnaires were administered. The findings of the study were not doctored to meet any preconceived or commercial ends. Materials and citations from other scholars were duly acknowledged by the researcher.

CHAPTER FOUR

RESEARCH FINDINGS AND ANALYSIS

4.1 Introduction

This chapter examined the research findings and thereafter data analysis. The study sought to examine contract management practices and completion of road construction projects by the county government of Machakos, Kenya. In order to address the general research objective, three research objectives were formulated. The study's specific research objectives included examination of the role of contractors' pre-qualification process, contractors' payment practices, and contract change management practices on their influence of completion of road projects by the County. The research findings were examined using descriptive statistics such as frequency distribution, means and standard deviation. These results were presented in pie charts, bar graphs and tables. In order to make conclusions on the relationship between diverse variables then the inferential statistics were used. The inferential statistics used in the study is multiple linear regressions.

4.2 Response Rate

The sample size of this study was 137 respondents and therefore 137 questionnaires were distributed. The questionnaires that were returned were 113 therefore making a response rate of 82.5%. This response rate was deemed sufficient in the context that Orodho (2009) indicates that a response rate of over 85% being excellent, 70-85% very good, 60-70% acceptable and below 50% not acceptable. The high response rate was achieved due to the fact that the researcher engaged the respondents for the purposes of reminding them to fill on the questionnaires. The high response rate

indicates that the results are sufficient for generalization as they can be considered a representative of the study population.

4.3 Respondent's Characteristics

The respondents' characteristics were examined using gender distribution, age distribution, and education levels.

4.3.1 Gender Distribution

The gender distribution results were illustrated through figure 4.1 below. The results indicated that 55.80% of the respondents were male while 44.2% of the respondents were female. The high number of the male respondents was attributed to the fact that construction industry is often and generally male denominated. This is due to the nature of work that makes it more attractive to the male gender. The gender aspect is critical in the road construction projects completion rates in the sense that levels of commitment and availability to supervise the road construction projects may vary across the gender.

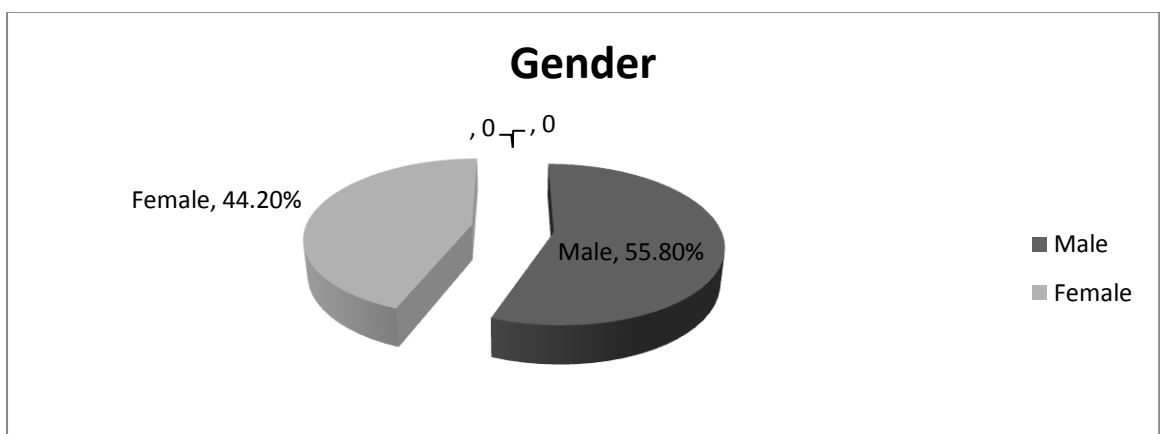


Figure 4.1: Employee Distribution by Gender

Source: Research Data (2016)

4.3.2 Length Worked at Machakos

In the context of the length of period worked at Machakos, the results were illustrated using figure 4.2 below. The results indicated that 52.2%, 38.10%, 5.30% and 4.40% of the respondents had worked for 0-2 years, 3-5 years, 6-8 years, and more than 8 years respectively. The length of the period worked in their respective institutions is an indication of their experience levels in their functions and therefore the validity of their results. The results indicated that slightly less than half of the respondents had worked for more than 2 years and were therefore highly knowledgeable on the aspects addressed by the research. It is also worth noting that the county governments have only been in existence for a fairly short period of less than four years. The length of time worked at Machakos County is critical for the completion of the road projects in the county in the context that the persons who have stayed longer in the county are well familiar with the road network in the county and have also networked with diverse stakeholders.

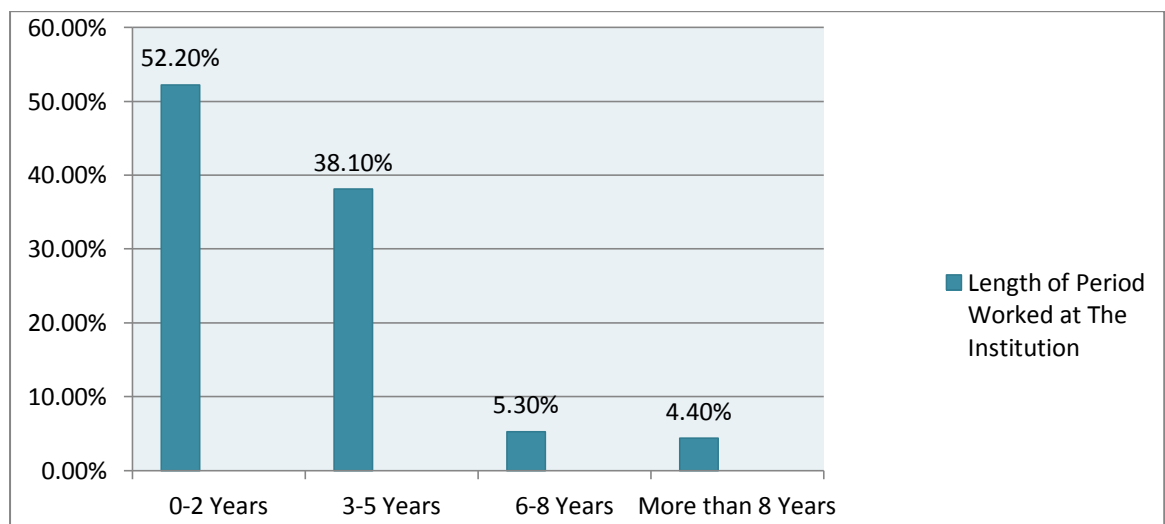


Figure 4.2: Length of Time Employed

Source: Research Data (2016)

4.3.3 Education Level

The educational level was examined using figure 4.5 below. The results indicated that 4.4%, 16.8%, 54.0%, and 24.8% of the respondents had PhD, Masters, Degree and Diploma level educational levels. The level of education is critical in ensuring that the respondents have the required technical know-how on the aspects being asked. In this context it was worth noting that 75.2% of the respondents had degree level education.

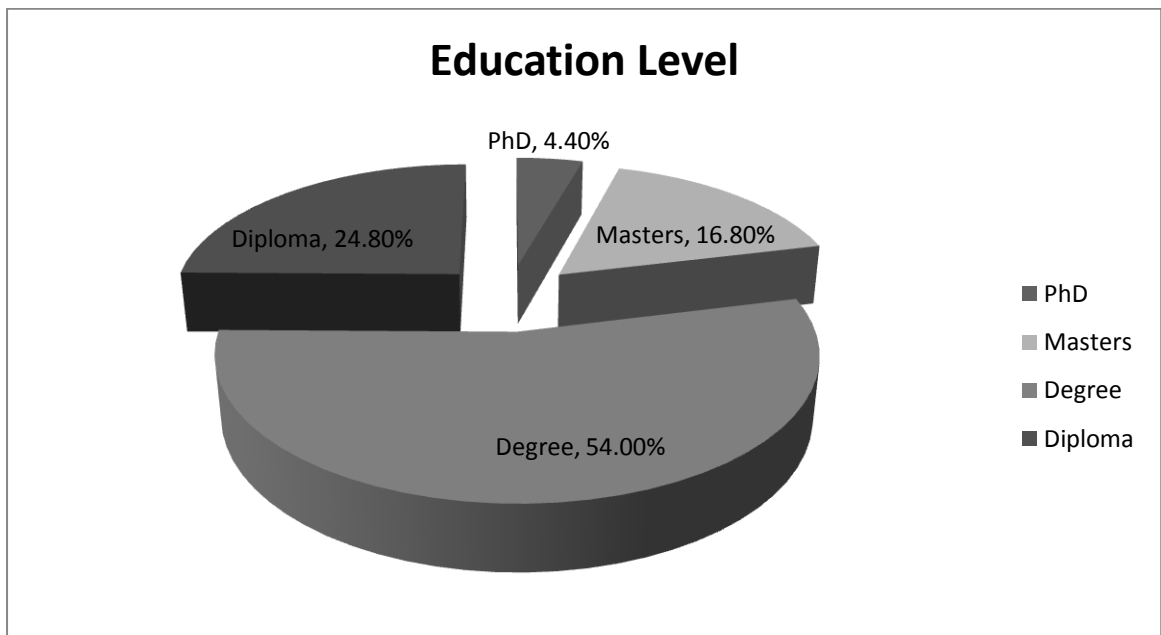


Figure 4.3: Level of Employee Education

Source: Research Data (2016)

4.4 Contractor Management Practices

The contract management levels were examined through use of completion rate of roads, road supervision rates, engagement of unqualified contractors, delay in paying contractors, changing of contract documents, and failure to supervise contractors.

4.4.1 Completion Rate of Roads

The results for the completion rates of roads were examined through figure 4.4 below. The results indicated that 58.40% of the respondents agreed that there was delay in completion of roads at Machakos County while 41.6% of the respondents disagreed. The road constructions are often faced by diverse challenges that affect their completion rates including stakeholder management, funds availability, equipment availability and the general work pace of the contractor.

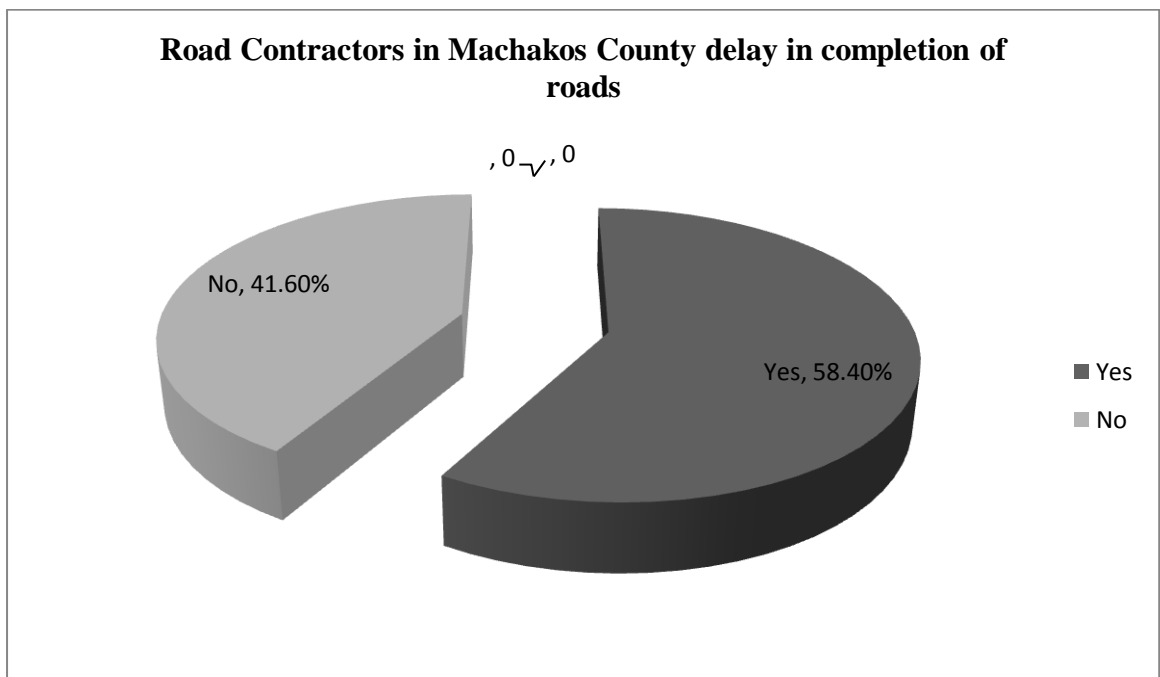


Figure 4.4: Completion Rate of Contractors

Source: Research Data (2016)

4.4.2 Road Contractors Supervision

In the context of supervision levels, the respondents were asked on the diverse levels in which County Government of Machakos undertook supervision levels. In this context, 9.7%, 8.8%, 43.4%, 18.6%, and 19.5% of the respondents indicated that there was no supervision, very related supervision, related supervision, close supervision

and very close supervision respectively. Supervision of the contractors is a key element of the work being completed on time as it ensures that the work developmental milestones are met on time and with the required quality. Therefore, supervision ensures on the timeliness of the work development as well the quality of the delivered work.

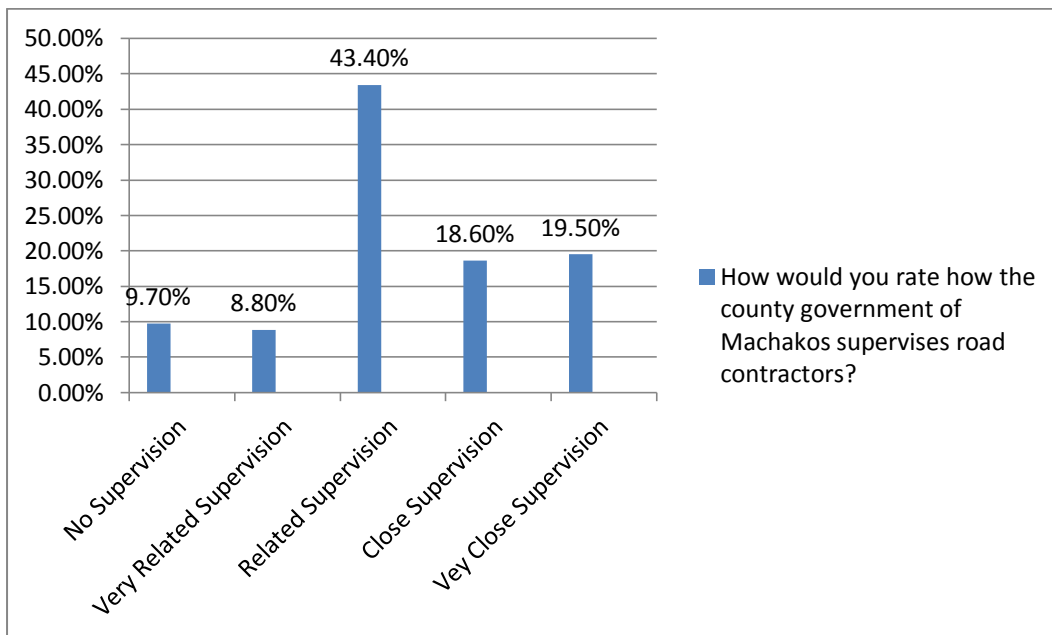


Figure 4.5: County Government Supervision

Source: Research Data (2016)

4.4.3 Contract Management Practices Effect on Road Construction Projects

In the context of the delays in the payment of contractors, 7.1%, 19.5%, 32.7%, and 40.7% of the respondents indicated that county government of Machakos delayed in payment of contractors to a small extent, average extent, great extent and very great extent respectively. The delays in the payment of the contractors have an effect of the completion of the construction projects. This is due to the fact that contractors may go slow or compromise the quality of work and then arm twist the county government to pay them. In the context of the changing of contract documents, 17.7%, 38.9%,

29.2%, and 14.2% of the respondents indicated that county government of Machakos changed contracts to a small extent, average extent, great extent and very great extent respectively. Finally, 20.4%, 52.2%, and 27.4% of the respondents indicated that the county government of Machakos failed to supervise contractors to no extent, small extent, and average extent respectively.

Upon the prompt that whether they engaged unqualified contractors, 49.6% responded they never engaged them, 30.1% agreed they engaged them at small extent, while 20.4% agreed they averagely engaged unqualified contractors. None of the subjects responded to engaging them to either a great extent or very great extent. On average most respondents felt that project managers engaged unqualified contractors at a small extent, with a mean score of 1.7080 and a deviation of .78696. The information in the table shows a relatively strict adherence to definition of procurement and planning which by the Principal-Agent results to timely implementation of the contract (Oluka and Basheka, 2012). 38.9% of the respondents felt that the project managers considered on average changing contract documents, 17.7% at small extent, 29.2% great extent and 14.2% at a very great extent.

The means (denoted by μ) and standard deviations (denoted by σ_x) of indicators of contract management practices were calculated. The interpretation was undertaken as follows. The scores of the mean $1 < \mu < 1.5$, $1.5 < \mu < 2.5$, $2.5 < \mu < 3.5$, $3.5 < \mu < 4.5$, and $4.5 < \mu \leq 5$ to be interpreted as the respondents on average perceived that there was no extent, small extent, average extent, great extent and very great extent of influence of the indicator on road construction projects in relations to the given metric respectively. The standard deviation (σ_x) scores; $0 < \sigma_x < 0.5$, $0.5 < \sigma_x < 1$, and $\sigma_x \geq 1$ to be interpreted as responses clustered around the mean, responses moderately distributed around the mean, and responses widely

distributed around the mean implying high consensus, moderate consensus and lack of consensus on a given metric respectively.

The mean score for engaging unqualified contractors was 1.708, for delay in paying contractors was 4.070, for changing of contract documents was 3.398, and for failure to supervise contractors was 2.070. On average, the respondents perceived that delay in paying contractors had a great extent of influence ($3.5 < \mu < 4.5$) on road construction projects. On the other hand, the respondents on average perceived that changing of contract documents had an average extent of influence ($2.5 < \mu < 3.5$) on road construction projects. The respondents' average perception of the influence of failure to supervise contractors as well as engaging unqualified contractors on road construction projects was that to a small extent ($1.5 < \mu < 2.5$), each indicator had an influence on the road construction projects.

In the context of distribution of responses around the mean and consensus levels, all the metrics had moderately distributed responses around the mean. This implies that there was moderate consensus ($0.5 < \sigma_X < 1$) on the extent of influence of each indicator on road construction projects. The respective standard deviations were 0.78696 for engaging unqualified contractors, 0.94223 for delay in paying contractors, 0.94055 for changing of contract documents, and 0.69071 for failure to supervise contractors.

Table 4.1: Contract Management

	Percentages					Mean	Std. Dev.
	1	2	3	4	5		
Engaging unqualified contractors	49.6	30.1	20.4	0	0	1.708	.78696
Delay in paying contractors	0.0	7.1	19.5	32.7	0	4.070	.94223
Changing of contract documents	0.0	17.7	38.9	29.2	0	3.398	.94055
Failure to supervise contractors	20.4	52.2	27.4	0	0	2.070	.69071

1. No extent 2. Small Extent 3. Average Extent. 4. Great extent 5. Very great extent

Source: Research Data (2016)

4.5 Contractor Prequalification

The respondents were asked whether they thought the county government issued contracts fairly based on the merit and qualifications brought forward to them. The following figure is a graphical representation of the results.

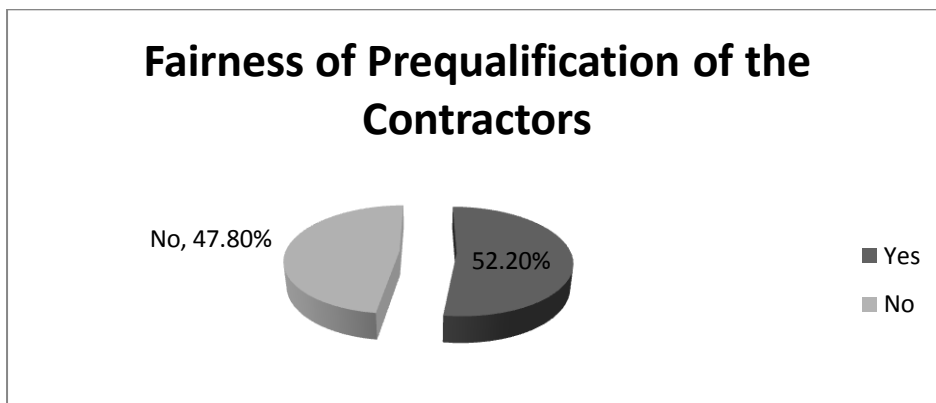


Figure 4.6

Fairness of Prequalification of Contractors

Source: Research Data (2016)

4.5.1 Emphasis of Different Contractor Prequalification Process

Half of the subjects of this study were of the opinion project managers emphasized on the contractor’s training at 50.6%, while 41.6% thought project managers did so at a small extent. Only 2.7% of the respondents felt the managers did so on rare occasions as those who thought the managers did so at very great extent were represented by

1.7% of the respondents. 3.5% were of the opinion that training of the contractor was important to the project manager.

Clearance with government bodies bore significant effect on the procuring entity as none of the respondents thought it was not important or has very minimal importance. 45.1% of the respondents greatly thought clearance with government entities was important, 31.9% thought they were important only on average and 23% thought very crucial to have clearance with government entities. Machinery is also important to the procurer as none of the respondents disagreed or agreed to a small extent. 38.9% of the subjects thought capacity of the contractor was either greatly important or very greatly important to the procurer. Only 22.1% of the respondents felt that capacity of the contractor was important to an average extent. Table 4.2 is a summary of the percentages.

The study sought to find out the extent to which respondents on average perceived various indicators are emphasized in the contractor prequalification process. The means (denoted by μ) and standard deviations (denoted by σ_x) of indicators of contractor pre-qualification process were calculated. The interpretation was undertaken as follows. The scores of the mean $1 < \mu < 1.5$, $1.5 < \mu < 2.5$, $2.5 < \mu < 3.5$, $3.5 < \mu < 4.5$, and $4.5 < \mu \leq 5$ to be interpreted as the respondents on average perceived that there was no extent, small extent, average extent, great extent and very great extent of emphasis on the indicator in the contractor prequalification process of road construction projects respectively.

The standard deviation (σ_x) scores; $0 < \sigma_x < 0.5$, $0.5 < \sigma_x < 1$, and $\sigma_x \geq 1$ to be interpreted as responses clustered around the mean, responses moderately distributed around the

mean, and responses widely distributed around the mean implying high consensus, moderate consensus and lack of consensus on a given metric respectively.

On average, the respondents' perception was that a great extent of emphasis ($3.5 < \mu < 4.5$) is put on the capacity of the contractor (machinery owned) in the contractor prequalification process of road construction projects (mean score=3.684). The mean scores for training of the contractor, experience of the contractor, past performance of the contractor, clearance with other government bodies (KRA, HELB, PPOA) were 3.051, 3.384, 3.347 and 3.461 respectively. These mean scores were in the range $2.5 < \mu < 3.5$, which implied that on average, the respondents' perception was that an average extent of emphasis is placed on training of the contractor, experience of the contractor, past performance of the contractor, and clearance with other government bodies (KRA, HELB, PPOA) in the contractor prequalification process of road construction projects.

The standard deviations for all the metrics on contractor prequalification were moderately distributed around the mean implying moderate consensus ($0 < \sigma_x < 0.5$) on the extent of emphasis placed on each indicator in the contractor prequalification process of road construction projects. Therefore, there was moderate consensus amongst respondents on the extent of emphasis placed on training of the contractor ($\sigma_x=0.956$), experience of the contractor ($\sigma_x=0.874$), and past performance of the contractor ($\sigma_x=0.851$) in the contractor prequalification process of road construction projects. Similarly, there was moderate consensus on the extent of emphasis placed on clearance with other government bodies like KRA, HELB, and PPOA which had a

standard deviation of 0.615, as well as capacity of the contractor (machinery owned) which has a standard deviation of 0.518.

Table 4.2: Contractor Prequalification

	Percentages					Mean	Std.Dev
	1	2	3	4	5		
Training of the contractor	2.7	41.6	50.6	3.5	1.7	3.051	0.956
Experience of the contractor	0.0	11.5	23.9	34.5	30.1	3.384	0.874
Past performance of the contractor	0.0	14.2	21.2	37.2	27.4	3.347	0.851
Clearance with other government bodies (KRA, HELB, PPOA)	0.0	0.0	31.9	45.1	23.0	3.461	0.615
Capacity of the contractor (machinery owned)	0.0	0.0	22.1	38.9	38.9	3.684	0.518

1. No extent 2. Small extent 3. Average extent 4. Great extent 5. “Very great extent”

Source: Research Data (2016)

4.6 Contractor Payment Methods

Delayed payments are the money amount not delivered to the contractors in the pre-agreed upon time between the procurer and the contractor.

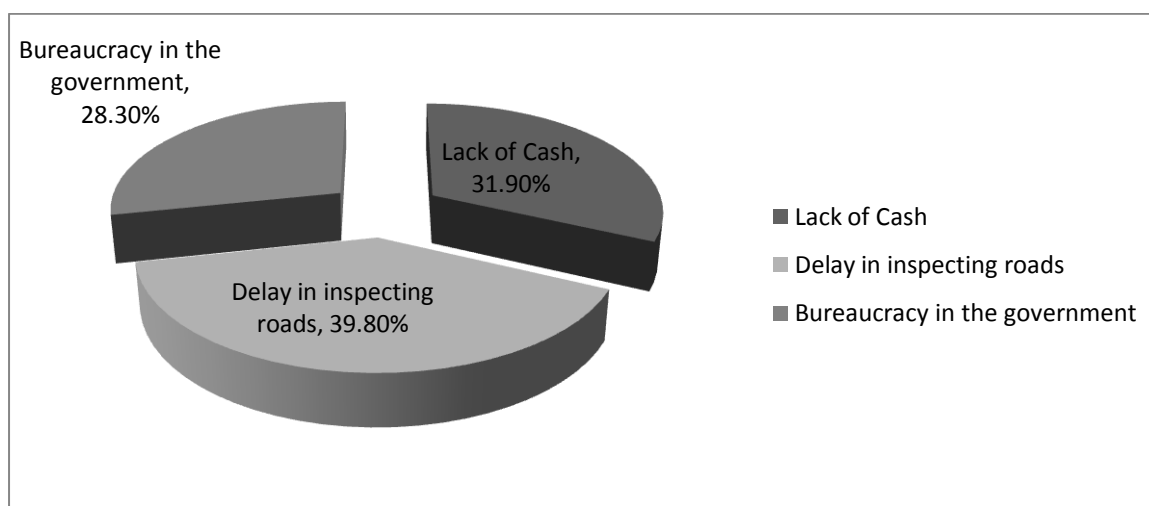


Figure 4.7: Reasons for Delay

Source: Research Data (2016)

From the pie-chart in figure 4.7, the biggest contributing factor is delays in inspecting the completed projects at 39.8% followed by unavailability of funds 31.9% and too much bureaucratic procedures in availing money to the contractors.

4.6.1 Factors Affecting Payments to Contractors

Factors affecting payments in the county governments include all issues that arise in the processes of compensating contractors. This issues include payment in time, payment in full or as per the agreed upon installments corruption complaints among other factors. The following table represents some of the factors and response percentages of subjects contacted. 38.9% of the respondents agreed at a "great extent" the delays in release of moneys by the central government hindered payments, while 24.8% agreed to an average extent. None of the respondents disagreed while 17.7% of the respondents agreed to a "small extent" and 18.6% agreed to a "very great extent". Respondents on average tended to report to a "great extent" that release of monies by the central government hinders payments with a score of 3.5841 and deviation of .98856. The cycle of releasing monies by the central government falls under organizational bureaucracy and laid down procedures of doing what is needed by the government procuring officials.

While it would be expected that bribery by county officials would get great response from the respondents those who agreed to a "very great extent" were only 4.4% almost four times as smaller as those who completely disagreed at 16.8%. Most respondents were of the opinion that the central government's budgetary cycle created a bottle neck in the payment processes as 41.6% of them agreed to a "very great extent" and 30.1% agreed to a "great extent".

The study sought to find out the extent to which respondents on average perceived factors affect payment to contractors. The means (denoted by μ) and standard deviations (denoted by σ_x) of indicators of affecting payment were calculated. The interpretation was undertaken as follows. The scores of the mean $1 < \mu < 1.5$, $1.5 < \mu < 2.5$, $2.5 < \mu < 3.5$, $3.5 < \mu < 4.5$, and $4.5 < \mu \leq 5$ to be interpreted as the respondents on average perceived that the indicators affected payment to contractors to no extent, small extent, average extent, great extent and very great extent in road construction projects respectively. The standard deviation (σ_x) scores; $0 < \sigma_x < 0.5$, $0.5 < \sigma_x < 1$, and $\sigma_x \geq 1$ to be interpreted as responses clustered around the mean, responses moderately distributed around the mean, and responses widely distributed around the mean implying high consensus, moderate consensus and lack of consensus on a given metric respectively.

The average opinion on demand for bribes by county government officials as a source of delayed or poor payment practices was 2.7788 with a deviation from the mean of 1.0668. The score falls in the bounds of “average extent” with there being no consensus on the metric. The average perception of the respondents was that to a great extent ($3.5 < \mu < 4.5$), release of monies by the central government, bureaucracy in the finance department, the government budgetary circle, disagreements over contractual obligations affected payment to contractors in road construction projects. The mean scores for the individual metrics were 3.5841 for release of monies by the central government, 3.6991 for bureaucracy in the finance department, 4.0354 for the government budgetary circle, and 3.8319 for disagreements over contractual obligations.

While no response was recorded for “No Extent” in the questionnaire prompt of whether disagreements over contractual obligations, the average opinion on the matter was “great extent” marked by a mean of 3.8319 and deviation of 0.9811. Going by expectations of this study, conflicts in the payments of contactors draws a significant amount of study. Bottle necks in the government budgetary allocations and too much bureaucracy are some of the issues that rock payments of contractors (Nguyen, 2013).

The responses for bureaucracy in the finance department ($\sigma_x=1.328$) and the government budgetary circle ($\sigma_x=1.008$) were widely distributed around the mean which implied that there was no consensus ($\sigma_x \geq 1$) amongst respondents on the extent of effect of each metric on the payment to contractors in road construction projects. On the other hand, responses for release of monies by the government ($\sigma_x=0.9885$), and disagreements over contractual obligations ($\sigma_x=1.9811$) were moderately distributed around the mean. This implied that there was moderate consensus ($0 < \sigma_x < 0.5$) on the extent of effect of both metrics on the payment to contractors in road construction projects.

The respondents on average perceived that the demand for bribes by county government officials to an average extent affected payment to contractors in road construction projects. This is because the metric had a mean score of 2.7788 which was in the range $2.5 < \mu < 3.5$. The responses on the demand for bribes by county government officials were widely distributed around the mean ($\sigma_x=1.066$) which implied there was no consensus amongst respondents on the extent of effect that this metric had on payment to contractors in road construction projects. Bribery is one of the biggest stumbling blocks to development in developing countries which is not only seen in the government contracts but also in the almost every arm of the government. While it is expected that demand for bribes would affect allocation to a

great extent, even a moderate extent is not good enough in ensuring contracts are carried to term.

Table 4.3: Factors Affecting Payment to Contractors

	Percentages					Mean	Std. Dev.
	1	2	3	4	5		
Release of monies by the central government	0.0	17.7	24.8	38.9	18.6	3.5841	.9885
Bureaucracy in the finance department	8.0	14.2	16.8	22.1	38.9	3.6991	1.328
Demand for bribes by county government officials	16.8	19.5	32.7	26.6	4.4	2.7788	1.066
The government budgetary circle	0.9	8.0	19.5	30.1	41.6	4.0354	1.008
Disagreements over contractual obligations	0.0	11.5	23.0	36.3	29.2	3.8319	.9811

1. No extent 2. Small extent 3. Average extent. 4. Great extent 5. “Very great extent”

Source: Research Data (2016)

4.6.2 Contractors’ Behavior over Non-Payment

This subsection of this paper gives the actions taken by the contractors when their payments are either delayed, completely not paid or other complaints by the contractors. From the Table 4.4, most contractors (38.9%) “Never” pursue legal options when procurers fail to pay them, sharply contrasting the .9% of the respondents who “Always” use legal means to get their pay. Most respondents on average felt that contractors “usually” pursued litigation over non-payment issues with an average score of 3.3805 out of 5 and a deviation from the mean of 1.0633.

Most respondents reported that contractors “Regularly” complain over delayed payments at 40.7%, while those who “Never” or “Rarely” complain were represented by 2.7%. The respondents also reported that those who “always” complained over delayed payments were at 24.8%, 4.4% higher than those who “Usually” complain.

The study sought to find out how frequently the respondents perceived litigation by contractors over non payment, complains by contractors over delayed payment, and complaints by contractors over the amount to be paid occurred. The means (denoted by μ) and standard deviations (denoted by σ_x) of indicators of contract payment systems were calculated. The interpretation was undertaken as follows. The scores of the mean $1 < \mu < 1.5$, $1.5 < \mu < 2.5$, $2.5 < \mu < 3.5$, $3.5 < \mu < 4.5$, and $4.5 < \mu \leq 5$ to be interpreted as the respondents on average perceived the indicators never, rarely, usually, regularly, always occurred over no payment in the road construction projects respectively. The standard deviation (σ_x) scores; $0 < \sigma_x < 0.5$, $0.5 < \sigma_x < 1$, and $\sigma_x \geq 1$ to be interpreted as responses clustered around the mean, responses moderately distributed around the mean, and responses widely distributed around the mean implying high consensus, moderate consensus and lack of consensus on a given metric respectively.

The average feeling about contractors complaining over delayed payments was that they did so “regularly” as indicated by a mean score of 3.823 and a deviation of 0.92804. Similarly, the respondents on average felt that complaints by contractors over the amount to be paid occurred regularly as indicated by a mean score of 3.8319 which was in the range ($3.5 < \mu < 4.5$). The responses for complains by contractors over delayed payment and complaints by contractors over the amount to be paid were moderately distributed around the mean with standard deviations of 0.92804 and 0.95340 respectively. This implied that there was moderate consensus ($0 < \sigma_x < 0.5$) that complains by contractors over delayed payment and over the amount to be paid occurred regularly in the road construction projects. The respondents on average felt that litigation by contractors over non payment usually occurred ($2.5 < \mu < 3.5$) in the road construction projects as it had a mean score of 3.3805. However, there was no

consensus ($0 < \sigma_x < 0.5$) amongst respondents that litigation by contractors over non payment usually occurred in the road construction projects ($\sigma_x = 1.0633$).

Table 4.4: Contractor Behaviour over Non-payment

	Percentages					Mean	Std. Dev.
	1	2	3	4	5		
Litigation by contractors over non payment	38.9	27.4	18.6	14.2	0.9	3.3805	1.0633
Complains by contractors over delayed payment	2.7	2.7	29.2	40.7	24.8	3.8230	.92804
Complaints by contractors over the amount to be paid	0.0	11.5	20.4	41.6	26.5	3.8319	.95340

1. Never 2. Rarely 3. Usually 4. Regularly 5. Always

Source: Research Data (2016)

4.7 Contract Change Management Practices

In the realm of project management, changing contractors is not an unusual affair. However, the frequency of changing contractors is what draws the most attention. The following is a graphical representation of the trends in changing contractors as reported by the respondents.

4.7.1 Changes in the Contracts

Most respondents felt that contracts were changed “Regularly” at 36.3%. Those who felt that the contracts were changed “usually” were represented by 26.5%, “Rarely” and always both at 18.6%.

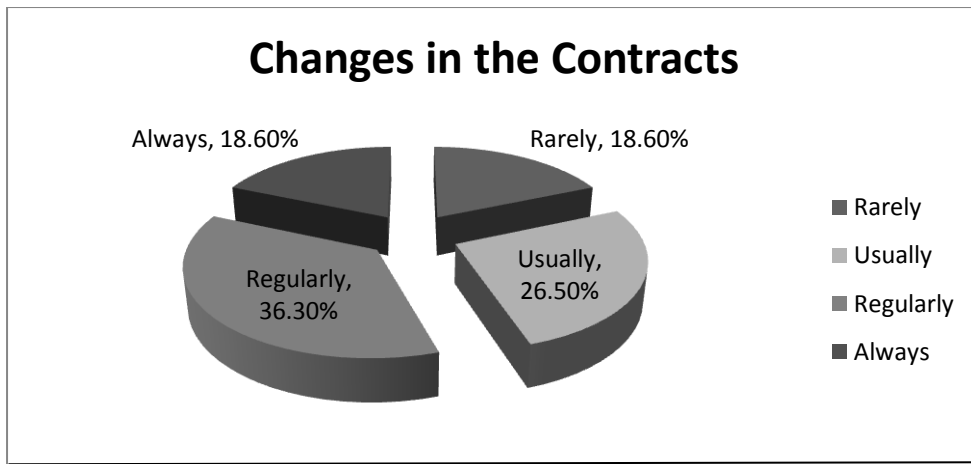


Figure 4.8: Contract Change Management Practices
Source: Research Data (2017)

4.7.2 Contract Change Process

In the below table the main variables in the processes of changing contracts were posed to the respondents. 36.3% of the respondents were of the opinion that adequate provisions in contract document for change are used at both “great extent” and “very great extent”. 19.5% of the subjects responded at “average extent”, 6.2% at “small extent” and 1.8% at “no extent” as summarized in the table below. Generally, respondents agreed to an average extent that adequate provisions in contract documents for change were included at an average score of 3.9912 and a mean of .98648. Ketchen, & Hult (2006) noted that termination of contracts and due to incompetence of the contractors or inflated prices of goods, very little has been documented on the causes contract change when the client is a government. The reasons highlighted here therefore add to the existing literature of the factors that influence contract termination at local government levels. The below table summarizes this information.

The study sought to find out the extent to which respondents on average perceived due diligence is conducted to ascertain the authenticity of change, the government and contractor agree on the cost of change, and there are adequate provisions in contract document for change done during the contract change process. The means (denoted by μ) and standard deviations (denoted by σ_x) of indicators of contract change process were calculated. The interpretation was undertaken as follows. The scores of the mean $1 < \mu < 1.5$, $1.5 < \mu < 2.5$, $2.5 < \mu < 3.5$, $3.5 < \mu < 4.5$, and $4.5 < \mu \leq 5$ to be interpreted as the respondents on average perceived that to no extent, small extent, average extent, great extent and very great extent is the respective metric done during the contract change process in road construction projects.

The standard deviation (σ_x) scores; $0 < \sigma_x < 0.5$, $0.5 < \sigma_x < 1$, and $\sigma_x \geq 1$ to be interpreted as responses clustered around the mean, responses moderately distributed around the mean, and responses widely distributed around the mean implying high consensus, moderate consensus and lack of consensus on a given metric respectively.

All the indicators on the contract change process in road construction projects had mean scores in the range of $3.5 < \mu < 4.5$. This implied that on average the respondents felt that to a great extent, due diligence is conducted to ascertain the authenticity of change ($\mu=3.7611$), the government and contractor agree on the cost of change ($\mu=3.6726$), and there are adequate provisions in contract document for change ($\mu=3.9912$).

There was moderate distribution of responses in regards to there being adequate provisions in contract document for change as the standard deviation was 0.9864. This

implied that there was moderate consensus ($0.5 < \sigma_x < 1$) amongst respondents that to a great extent there are adequate provisions in contract document for change during the contract change process of road construction projects.

Table 4.5: Contract Change Management Practices

	Percentages					Mean	Std. Dev.
	1	2	3	4	5		
Due diligence is conducted to ascertain the authenticity of change	0.0	16.8	16.8	39.8	26.5	3.7611	1.028
The government and contractor agree on the cost of change	0.0	15.9	24.8	35.4	23.9	3.6726	1.012
There are adequate provisions in contract document for change	1.8	6.2	19.5	36.3	36.3	3.9912	.9864

1. No Extent 2. Small Extent 3. Average Extent. 4. Great extent 5. Very great extent

Source: Research Data (2016)

On the other hand, the responses for due diligence is conducted to ascertain the authenticity of change ($\sigma_x=1.028$) and the government and contractor agree on the cost of change ($\sigma_x=1.012$) were widely distributed around the mean. This implied that there was no consensus ($\sigma_x \geq 1$) whether due diligence is conducted to ascertain the authenticity of change and the government and contractor agree on the cost of change during the contract change process of road construction projects.

4.7.3 Effect of Contract Changes on Road Projects

The following are the potential responses to effects of contract change in cost of roads projects and the corresponding responses. 0.0% of the respondents felt that contract changes had no effect on cost of roads projects as compared to 52.2% who thought that contract changes “Regularly” changes the cost of roads projects. 23.9% of the respondents

chose to say that contract changes “always” bring about changes in cost of roads projects, 8% chose “rarely” while 15.95 felt that contract changes “usually” altered the cost of road construction. On average, respondents felt that contract changes “Regularly” caused a change in cost of roads projects at a mean Likert score of 3.9204 with a standard deviation of .84665. The degree of pinch in terms of cost, time for completion, quality of work done and complete termination of contractor due to change in contract management is well documented. Aje, Odusami and Ogunsemi (2009), strengthen the evidence that change in contract management definitely affects the time taken to complete the project as well as increase the cost of the entire project in the long run.

An equal percentage of respondents were of the opinion that contract changes altered completion time of road projects “Always’ and “Never” respectively at 8%. Most respondents believed that contract changes “always” altered the quality of roads projects at 38.1%, while 29.2% believed the changes “Regularly” changed the quality of roads projects.. 25.7% of the respondents thought that the changes in contract “usually” changed quality of roads.

The study sought to find out how frequently the respondents perceived change in cost of roads project, change in completion time of roads projects, change in quality of road projects, and termination of contractors work occurred during contract change process of road construction projects. The means (denoted by μ) and standard deviations (denoted by σ_x) of indicators of contract change process were calculated. The interpretation was undertaken as follows. The scores of the mean $1 < \mu < 1.5$, $1.5 < \mu < 2.5$, $2.5 < \mu < 3.5$, $3.5 < \mu < 4.5$, and $4.5 < \mu \leq 5$ to be interpreted as the respondents on average perceived the indicators never, rarely, usually, regularly, always occurred during contract change process in the road construction projects respectively.

The standard deviation (σ_x) scores; $0 < \sigma_x < 0.5$, $0.5 < \sigma_x < 1$, and $\sigma_x \geq 1$ to be interpreted as responses clustered around the mean, responses moderately distributed around the mean, and responses widely distributed around the mean implying high consensus, moderate consensus and lack of consensus on a given metric respectively.

On average, the respondents tended to think that change in cost of roads project ($\mu=3.9204$), change in quality of road projects ($\mu=3.9823$), and termination of contractors work ($\mu=3.7522$), regularly occur during contract change process in road construction projects. This is because their mean scores were in the range of $3.5 < \mu < 4.5$. There was moderate consensus ($0 < \sigma_x < 0.5$) amongst respondents that change in cost of roads project ($\sigma_x = 0.84665$), change in quality of road projects ($\sigma_x = 0.96346$), and termination of contractors work ($\sigma_x = 0.92129$), regularly occur during contract change process in road construction projects. This is because the responses on these metrics were moderately distributed around their respective means.

On the other hand, there was no consensus ($\sigma_x \geq 1$) on the average perception of respondents that change in completion time of roads projects usually occurs ($2.5 < \mu < 3.5$) during contract change process in road construction projects. This is due to the high standard deviation of 1.1361 which meant responses were widely distributed around the mean for this metric as well as a mean score of 2.9381.

Table 4.6: Contract Change on Road Projects

	Percentages					Mean	Std. Dev.
	1	2	3	4	5		
Change in cost of roads project	0.0	8.0	15.9	52.2	23.9	3.9204	.84665
Change in completion time of roads projects	8.0	35.4	19.5	29.2	8.0	2.9381	1.1361
Change in quality of road projects	0.0	7.1	25.7	29.2	38.1	3.9823	.96346
Termination of contractors work	0.0	12.4	20.4	46.9	20.4	3.7522	.92129

1. Never 2. Rarely 3. Usually 4. Regularly 5. Always

Source: Research Data (2016)

4.7.4 Engineers Supervision of Contracts

More respondents felt that the county governments did not have enough engineers to supervise contractors as compared to those were for the opinion that county government had enough engineers for supervision.

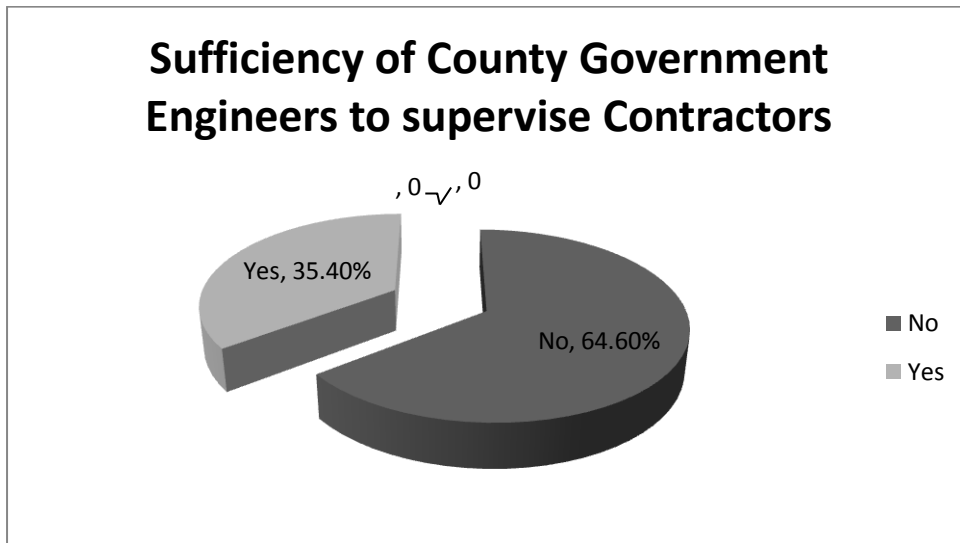


Figure 4.9: County Supervision of Contractors

Source: Research Data (2016)

4.7.5 Factors Affect Supervision of Contractors

The number who felt that corruption “Never” (8.8%) affected supervision of contractors was double that which felt corruption “always” (4.4%) affected supervision of contractors. Those who were of the opinion that corruption “usually” affected supervision of the contractors was 7% less than the number of people who

felt that corruption “rarely” (21.2%) affected supervision of contractors. 36.3% of the respondents felt that corruption “regularly” hindered contractor supervision. Additionally, corruption was on average rated as a “usual” bottle neck to supervision of contractors with a likert scale of 2.9823 and deviation of 1.093.

None of the respondents felt that lack of enabling structures for supervision “never” affects supervision, while 10.6% thinks that lack of enabling structures “Rarely” affect supervision. Finally, 37.2% of the respondents were of the opinion that lack of enabling structures for supervision “always” affected supervision. Lack of policies and lack of enabling structures for supervision were both on average voted as “regular” stumbling blocks to affecting supervision with averages of 3.735 and 3.9735 respectively with deviations of .96379 and .99517 respectively.

The study sought to find out how frequently the respondents perceived a lack of resources to monitor contractors, corruption, lack of policies on contractor supervision and lack of other enabling structures for supervision affect supervision of contractor in road construction projects. The means (denoted by μ) and standard deviations (denoted by σ_x) of indicators of contract change process were calculated. The mean scores $1 < \mu < 1.5$, $1.5 < \mu < 2.5$, $2.5 < \mu < 3.5$, $3.5 < \mu < 4.5$, and $4.5 < \mu \leq 5$ were to be interpreted as the respondents on average perceived the indicators never, rarely, usually, regularly, always affect supervision of contractor in the road construction projects respectively. The standard deviation (σ_x) scores; $0 < \sigma_x < 0.5$, $0.5 < \sigma_x < 1$, and $\sigma_x \geq 1$ to be interpreted as responses clustered around the mean, responses moderately distributed around the mean, and responses widely distributed around the mean

implying high consensus, moderate consensus and lack of consensus on a given metric respectively.

On average, the respondents felt that lack of resources to monitor contractors ($\mu=3.6283$), lack of policies on contractor supervision ($\mu=3.7345$), and lack of other enabling structures for supervision ($\mu=3.9735$), regularly affect supervision of contractor in road construction projects. This is because their mean scores were between 3.5 and 4.5. Additionally, in respect to the three metrics, there was moderate consensus on their effect on ($\mu=3.6283$) This is because the responses for the three metrics were moderately distributed around the mean as their standard deviations were 0.98375 for lack of resources to monitor contractors, 0.96379 for lack of policies on contractor supervision and 0.99517 for lack of other enabling structures for supervision which were in the range $0 < \sigma_x < 0.5$.

On the other hand, the respondents on average felt that corruption usually ($2.5 < \mu < 3.5$) affects supervision of contractor in road construction projects as the mean score was 2.9823. Responses for corruption were widely distributed around the mean which implied there was no consensus ($\sigma_x \geq 1$) that corruption usually affects supervision of contractor in road construction projects as the standard deviation was 1.0936.

Table 4.7: Supervision of contracts

	Percentages					Mean	Std. Dev.
	1	2	3	4	5		
Lack of resources to monitor contractors	3.5	9.7	23.0	47.8	15.9	3.6283	.98375
Corruption	8.8	29.2	21.2	36.3	4.4	2.9823	1.0936
Lack of policies on contractor supervision	1.8	11.5	17.7	49.6	19.5	3.7345	.96379
Lack of other enabling structures for supervision	0.0	10.6	18.6	33.6	37.2	3.9735	.99517

1. Never 2. Rarely 3. Usually 4. Regularly 5. Always

Source: Research Data (2016)

4.8 Road Projects Completion

In comparison to The Central Government, the county government of Machakos was rated higher in the time it took to complete road construction projects as is discussed below.

4.8.1 Comparative Rates of Road Completion by County Government

The county government was rated as better placed to complete roads constructions as opposed to the central government with 51.3% and 48.7% respectively. The information is represented graphically by the following pie chart.

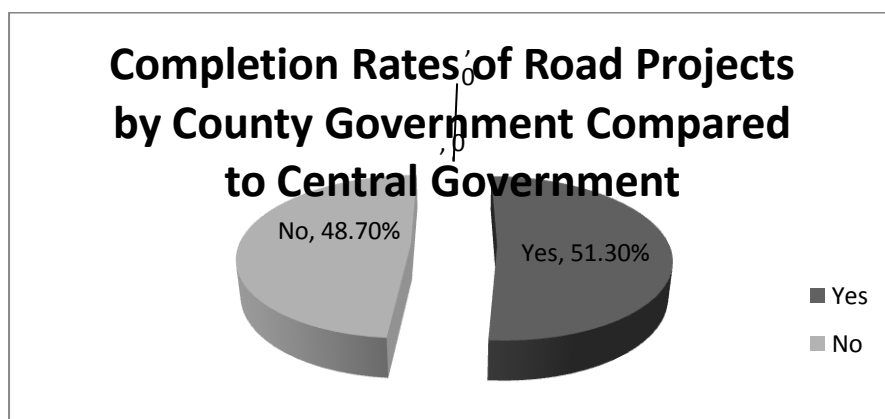


Figure 4.10: Rate of Completion
Source: Research Data (2016)

4.8.2 Roads Performance Metrics in County Government

15.9% of the respondents felt that the priority of roads built affected performance to a “very great extent”, 5.3% felt it was to no extent, 23.7% felt it was to a “small extent”, 35.4% were of the opinion it was to a “great extent” and 19.5% thought it was to an “average extent”. The general reaction of those interviewed when asked whether priority of the roads built contributed to performance was that it actually contributed to an average extent with a likert mean score of 3.3274 and deviation of 1.1606. Of those who responded, 29.2% believed that cost of construction affected performance of roads both to a “great extent” and to a “very great extent”, 15.9% thought cost of construction and inputted “small extent” and 24.8% inputted “average extent”. Only .9% of the respondents thought cost of construction had no extent on the performance of the roads.

The study sought to find out the extent to which priority of roads built, time taken to complete roads, cost of constructing road, and quality of roads constructed has changed under the county government. The means (denoted by μ) and standard deviations (denoted by σ_x) of indicators of has changed under the county government calculated. The mean scores $1 < \mu < 1.5$, $1.5 < \mu < 2.5$, $2.5 < \mu < 3.5$, $3.5 < \mu < 4.5$, and $4.5 < \mu \leq 5$ were interpreted as the respondents on average perceived that there was no extent, small extent, average extent, great extent and very great extent of change of a given metric under the county government road construction projects respectively. The standard deviation (σ_x) scores; $0 < \sigma_x < 0.5$, $0.5 < \sigma_x < 1$, and $\sigma_x \geq 1$ to be interpreted as responses clustered around the mean, responses moderately distributed around the mean, and responses widely distributed around the mean implying high consensus, moderate consensus and lack of consensus on a given metric respectively.

The respondents on average perceived to a great extent ($3.5 < \mu < 4.5$) cost of constructing roads ($\mu = 3.6991$), and quality of roads constructed ($\mu = 3.9292$) have changed under the county government. There was however different levels of consensus amongst respondent on both metrics. There was no consensus amongst respondents on the extent of change in cost of constructing roads ($\sigma_x = 1.0846$), but there was moderate consensus amongst respondents on the extent of change in quality of roads constructed ($\sigma_x = 0.9610$).

On the other hand, the respondents on average perceived to an average extent ($2.5 < \mu < 3.5$) the priority of roads built ($\mu = 3.3274$) and time taken to complete roads ($\mu = 3.4602$) have changed under the county government. However, the responses on the priority of roads built under the county government were widely distributed around the mean which implied there was no consensus ($\sigma_x \geq 1$) amongst the respondents on the extent of change ($\sigma_x = 1.1606$). The responses on the time taken to complete roads under the county government were moderately distributed around the mean which implied there was no consensus ($0.5 < \sigma_x < 1$) amongst the respondents on the extent of change ($\sigma_x = 0.9639$).

Table 4.8 : Road Performance Metrics

	Percentages					Mean	Std. Dev.
	1	2	3	4	5		
Priority of roads built	5.3	23.9	19.5	35.4	15.9	3.3274	1.1606
Time taken to complete roads	0.0	20.4	26.5	39.8	13.3	3.4602	0.9639
Cost of constructing roads	0.9	15.9	24.8	29.2	29.2	3.6991	1.0846
Quality of roads constructed	0.0	8.8	23.0	34.5	33.6	3.9292	0.9610

Source: Research Data (2016)

4.9 Regression Model

The regression model was utilized for the purposes of examining the influence of the four independent variables on the dependent variable. The multiple linear regression coefficient of 0.842 indicated that there was a positive correlation between the four independent variables and the dependent variable. The adjusted R Square Statistic was 0.696. Thus, 69.6% of the total variation in the values of Completion of Road Projects is explained by the combination of the independent variables Supervision, Prequalification, Contractors' Payment Practices, Contract-change and Management Practices. The rest is due to chance or factors beyond this model. 62.9% value of adjusted R square shows a good fit.

Table 4.9: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.842 ^a	.709	.696	.47782

a. Predictors: (Constant), Supervision, Prequalification, Contractors' Payment Practices , Contract-change Management Practices

Source: Research Data (2016)

The ANOVA statistics were used to determine on whether the regression was a good fit for data. In this case since p value is 0.000 which is less than 0.05 then the regression was found to be good fit for data.

Table 4.10: ANOVA

Source	Degrees of Freedom	Sum of Squares	Mean Sum of Squares	F	p-value
Regression	4	44.31	11.08	48.518	0.000
Error	108	24.66	0.228		
Total	112	68.91			

Source: Research Data (2016)

The regression model coefficients were derived from Table 4.11 to construct the following regression model;

$$\text{Completion of Roads} = -0.267 + 0.289x_1 + 0.986x_2 + 0.0326x_3 + 0.050x_4$$

Where X_1 is the contractor's prequalification, X_2 is the contractors' payment practices (CPP), X_3 is the Contract Management Practice (CMP) and X_4 is supervision. While holding CPP, CMP and supervision constant, prequalification of the contractor is likely to cause a .289 unit increase in Completion of roads for every unit increase in contractors prequalification. The prequalification of the contractor is a critical component in ensuring that the contractors with the right qualifications are sourced. These contractors should have the right qualifications and technical expertise as well as financial capabilities to carry out the scope of work.

While holding Prequalification, supervision and CMP constant, a unit increase in CPP is bound to cause 0.986 increase in completion of roads. The Contractor Payment Practices was seen to give a positive influence on the completion of the road projects since the payment practices influences the quality of roads undertaken. The contractors who have not been paid their dues are likely to abandon work half way for nonpayment of services.

While holding Prequalification, supervision and CPP constant, a unit increases in CMP is bound to cause an average increase in completion of roads of 0.0326. The Contract Management Practices are critical in ensuring that the contract is executed as per scope of work in regards to timelines and quality of work. This aspects influence the road projects completion rates.

Finally, a unit increase in supervision would lead to a 0.050 increase in completion of roads with the other independent variables kept constant. Supervision is key in the execution of the projects in the sense that it ensures that road contract scope of work progresses as planned.

Table 4.11: Linear Relationship Coefficients

	B	Std. Error	t	p-value
(Constant)	-.267	.401	-.665	.508
Prequalification	.289	.117	2.47	.016
Contractors' Payment Practices	.986	.122	8.057	.000
Contract-change Management Practices	.0326	.140	.325	.0305
Supervision	.050	.132	.379	.705

Source: Research Data (2016)

While each of the individual independent variables had a statistically significant linear relationship with the response, some of them failed to pass the significance test in the multiple-linear regression model. The p-value for prequalification was .016 which was below the .05 level rendering Prequalification to be having a linear relationship with the response. Contractors' Payment practices had a proven linear relationship with the response in the multiple-linear regression model at a p-value of 0.000. Contract-change Management practices and Supervision had p-values of .0305 and .705 respectively with the latter exceeding 0.05 level. Contract Change Management Practices was a sufficient predictor of Completion of Roads in Machakos County roads. This implies that contract change management practices had a significant effect on completion of road projects in Machakos County roads. On the other hand, supervision was not seen to have significant influence on road completion of projects due to a p value greater than 0.05.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMEDATIONS

5.1 Introduction

This chapter examines the summary, conclusions and recommendations of the study based on the specific research objectives.

5.2 Summary

The aim of this study was to establish whether certain selected independent variables had a significant impact on completion of road constructions a case of Machakos County Tarmacked roads. Analysis of the dependent and independent variables was done and the results interpreted that three independent variables (Prequalification, Contractors' Payment Practices and, Contract-change Management Practices) had statistically significant effect on the response.

5.2.1 Contractors' Pre-Qualification Process on the Completion of Road Projects

In the context of the contractors prequalification process influence on completion of road projects, the experience of the contractor was a significant component. None of the respondents thought that the experience of the contractor was not useful. The aspects of past performance of the contractors were significant in completion of road projects as indicated by a majority of the respondents. Clearance with government bodies bore significant effect on the procuring entity as none of the respondents thought it was not important or has very minimal importance. The use of machinery was also a significant component to the completion of road projects.

5.2.2 Contractors' Payment Practices on the Completion of Road Projects

The study examined the contractors' payment practices on completion of road projects. Amongst the aspects that were found contributing to delays in payments factors include delays in inspecting the completed projects followed by unavailability of funds and too much bureaucratic procedures in availing money to the contractors. The bureaucracy in the finance department as a stumbling block in payments and demand for bribes by county government officials as a source of delayed or poor payment practices was found to affect the road completion to an average extent. Bribery is one of the biggest stumbling blocks to development in developing countries which is not only seen in the government contracts but also in the almost every arm of the government. While it is expected that demand for bribes would affect allocation to a great extent, even a moderate extent is not good enough in ensuring contracts are carried to term. Bottle necks in the government budgetary allocations and too much bureaucracy are some of the issues that rock payments of contractors.

5.2.3 Contract-Change Management Practices on the Completion of Road Projects

The influence of the contract change management practices was examined. The respondents felt that the contracts were changed in an infrequent manner. On average, subjects felt at a "great extent" that due diligence is conducted to ascertain the authority of change. On average, respondents felt that contract changes "Regularly" caused a change in cost of roads projects. The degree of pinch in terms of cost, time for completion, quality of work done and complete termination of contractor due to change in contract management is well documented.

5.2.4 Contractors' Supervision Activities on the Completion of Road Projects

More respondents felt that the county governments did not have enough engineers to supervise contractors as compared to those were for the opinion that county government had enough engineers for supervision. On average respondents tended to conclude that lack of resources to monitor contractors “regularly” affected supervision.. While Miller (2005) appears to critically define what should be measured and its overall impact on the project, the evidence presented in these results clearly show that there is need for resource allocation for monitoring contractors. Additionally, corruption was on average rated as a “usual” bottle neck to supervision of contractors.

5.3 Conclusions

The conclusions of the study were examined per research objective.

In relations to completion of road projects, the study found that 45.3% of the completion of road projects could be attributed to contractor prequalification. The study also found that there was statistically significant relationship between contractors' prequalification process and the completion of road projects. From the regression model, while holding all the other variables constant, prequalification has a positive correlation with the response. Thus from our study contractor's qualification details have improve the chances of road completion

In the context of the contractors' payment practices on completion of road projects, the study found that 64.1% of the variation in values of Completion of Road Projects is explained by variation in values of the independent variable Contractor Payment

Practices. The study also found that contractors' payment practices are statistically significant to the completion of road projects. The simple linear regression model indicated that 33.8% of the variance in completion of road projects was attributed to contract change management practices

In respect to contract change management practices, the study found that there was a statistically significant relationship between Contract-Change Management Practices on the Completion of Road Projects. This was because the p value for regression analysis was below 0.05 as the hypothesis was being tested at 5% level of significance.

Contractors' supervision activities were found not be significant predictor of road completion rates as the study they had p values greater than 0.05. The study therefore concluded that the supervision on its own was not sufficient to influence on its own on the completion of road projects.

5.4 Recommendations

The following are the recommendations as derived from the findings of this study.

This study found out that contractor prequalification is an important aspect in predicting road completion. As was one of the significances of this study, the county government ought to emphasize on contractor prequalification documentation.

Payment practices were found to have a strong linear correlation with completion of road project outcomes. This implies that if contractor services are not compensated within the pre-agreed time then road completion outcomes are bound to suffer. With

that in mind, it is important that the county officials ensure timely and competitive payment packages that are also less bureaucratic.

While contract change Management practices had a significant role in the completion of roads, its overall effect on the regression model was the least. However, the fact that contract Management practices is positively correlated with completion of roads projects at county level, it is imperative that county officials in charge of procurement stop premature contract termination and other contract management issues in order to encourage road completion.

The supervision activities on their own were not seen as significant predictor of completion of road projects and therefore the county government should always embrace contract management practices, payment practices, and contractor prequalification in alongside supervision.

5.5 Recommendations for Further Studies

The study recommended for further studies an examination of the influence of the county management on the completion of road projects within the devolved government structure. The study also recommends for further studies the influence of contract management practices and completion of road construction projects within other county governments.

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APPENDIX ONE; INTRODUCTORY LETTER

Gloria Mulinde

TEL:

EMAIL: gloriamulinde@gmail.com

BOX:

RE: DEAR RESPONDENTS.

I am an **MBA (Project Management)** student at Kenyatta University conducting a research on: **influence of contract management practices and completion of road construction projects by the county government of Machakos, Kenya.** I hereby request you for the below stated information required for me to achieve my research objectives as part of requirement for MBA degree.

Information offered will be treated confidentially and used for the purpose of this research only. The findings of the research will ultimately help improve the performance of this company and especially the effectiveness of initiating and implementing business strategies.

Appreciation is offered as you aid in the creation of new knowledge to aid both the academy and the industry.

Regards,

.....

Gloria Mulinge

The Researcher/ Student

APPENDIX TWO; QUESTIONNAIRE
BACKGROUND INFORMATION

Tick appropriately to responds to the following questionnaires and supply additional information on the spaces provided.

1. State your gender.
 - i. Male ()
 - ii. Female ()

2. How long have you worked for this institution.
 - i. 0-2 Years ()
 - ii. 3-5 Years ()
 - iii. 6-8 Years ()
 - iv. more than 8 Years ()

3. Indicate your highest level of education.
 - i. PHD I ()
 - ii. Masters ()
 - iii. Degree ()
 - iv. Diploma ()
 - v. Any other ()

Specify.....
.....
.....

PART ONE: CONTRACT MANAGEMENT PRACTICES

4. Do the road contractors in Machakos County delay in completion of roads?
Yes ()
No ()
If yes explain how they delay the road construction projects
.....
.....
.....

5. How would you rate how the county government of Machakos supervises road contractors?
 - a) Very close supervision ()
 - b) Close supervision ()

- c) Related supervision ()
- d) Very related supervision ()
- e) No supervision ()

6. State the extent to which the following contract management practices affect road construction projects.

1. No extent 2. Small extent 3. Average extent. 4. Great extent 5. “very great extent”

	1	2	3	4	5
a) Engaging unqualified contractors					
b) Delay in paying contractors					
c) Changing of contract documents					
d) Failure to supervise contractors					

7. In your own opinion, what in what ways contract management practices can be adjusted to improve completion of road construction?

.....

PART TWO: CONTRACTOR PRE QUALIFICATION PROCESS

8. Would you agree with the statement that prequalification of contractors is fair?

- Yes ()
- No ()

Explain your answer

.....

9. Indicate the extent to which the following is emphasized in the contractor prequalification process using the following scale.

1. “very great extent” 2. Great extent 3. Average extent 4. Small extent 5. No extent

	1	2	3	4	5
a) Training of the contractor					
b) Experience of the contractor					
c) Past performance of the contractor					
d) Clearance with other government bodies. (eg KRA, HELB, PPOA)					
e) Capacity of the contractor (machinery owned)					

10. State the reasons why some of the contractors are not prequalified by the county government of Machakos.

.....

PART THREE: CONTRACT PAYMENT SYSTEMS

11. Tick on the reasons that mostly cause delayed payments to contractors.

- a) Lack of cash ()
- b) Delay in inspecting roads ()
- c) Bureaucracy in the government ()

12. Indicate the extent to which the following factors affect payment to contractors.

	1	2	3	4	5
a) Release of monies by the central government					
b) Bureaucracy in the finance department					
c) Demand for bribes by county government officials					
d) The government budgetary circle					
e) Disagreements over contractual obligations					

13. State the frequency with which the following occurs using the scale provided by contractors over no payment.

1. Never 2. Rarely 3. Usually 4. Regularly 5. Always

	1	2	3	4	5
Litigation by contractors over non payment					
Complains by contractors over delayed payment					
Complaints by contractors over the amount to be paid					

14. List what can be done to improve contract payment system.

.....

PART FOUR: CONTRACT CHANGE MANAGEMENT PRACTICES

15. Tick appropriately to indicate the frequency with which changes are made in this county.

1. Always 2. Regularly 3. Usually 4. Rarely 5. Never

16. Indicate the common reasons why contracts are changed.

.....

17. Indicate the extent to which the following is done during the contract change process using this scale.

1. “very great extent” 2. Great extent 3. Average extent 4. Small extent 5. No extent

	1	2	3	4	5
Due diligence is conducted to ascertain the authenticity of change					
The government and contractor agree on the cost of change					
There are adequate provisions in contract document for change					

18. Indicate the frequency the following occurs during contract change process using the following scale.

1. Always 2. Regularly 3. Usually 4. Rarely 5. Never

	1	2	3	4	5
Change in cost of roads project					
Change in completion time of roads projects					
Change in quality of road projects					
Termination of contractors work					

PART FIVE: CONTRACTOR SUPERVISION ACTIVITIES

19. Do you think the county government has enough engineers to supervise contractors?

Yes ()

No ()

20. Tick appropriately to indicate the extent to which the following factors affect supervision of contractor using the scale provided.

1. Always 2. Regularly 3. Usually 4. Rarely 5. Never

	1	2	3	4	5
a) Lack of resources to monitor contractors					
b) Corruption					
c) Lack of policies on contractor supervision					
d) Lack of other enabling structures for supervision					

21. Suggest ways in which contractor supervision activities can be improved

.....

PART SIX: COMPLETION OF ROAD PROJECTS

22. Would you rate the completion of road projects by county government as faster than central government?

Yes ()

No ()

23. Indicate the extent to which the following performance metrics in road construction has changed under the county government.

1. “very great extent” 2. Great extent 3. Average extent 4. Small extent 5. No extent

	1	2	3	4	5
Priority of roads built					
Time taken to complete					

roads					
Cost of constructing roads					
Quality of roads constructed					

24. In your own opinion, list the factors that affect roads construction projects in this area.


.....

.....

.....

APPENDIX THREE

NACOSTI AUTHORIZATION LETTER



**NATIONAL COMMISSION FOR SCIENCE,
TECHNOLOGY AND INNOVATION**

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2241349, 3310571, 2219420
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Website: www.nacosti.go.ke
when replying please quote

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

Ref. No. **NACOSTI/P/17/60628/15152**

Date: **18th January, 2017**

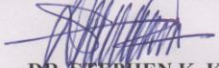
Gloria Syombua Mulinge
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *“Contract management practices and completion of road construction projects by the County Government of Machakos, Kenya,”* I am pleased to inform you that you have been authorized to undertake research in **Machakos County** for the period ending **17th January, 2018.**

You are advised to report **the County Commissioner and the County Director of Education, Machakos County** before embarking on the research project.

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


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

Copy to:

The County Commissioner
Machakos County.

The County Director of Education
Machakos County.

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

