

**DETERMINANTS OF COMPLETION OF ROAD
CONSTRUCTION PROJECTS IN NYAMIRA COUNTY
GOVERNMENT, KENYA**

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**A Research Report Submitted In Partial Fulfilment For The
Award of the Master of Arts in Project Planning and Management Degree, University Of
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DECLARATION

This Research Project Report is my original work and has not been submitted for an award of a degree in this or any other University

Signature Date

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This Research Project Report is submitted for examination with my approval as the University supervisor.

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DEDICATION

This Research Project Report is dedicated to my dear parents Mr. & Mrs. Momanyi, my brother Isaac Cousin Rena and my friends Joan Jeruto , Mercy Byegon , Spedah Kerubo, Evans Obiso and Esther for their moral support not forgetting my classmates for their encouragement and patience during entire period of my study and continued prayers towards completion of this course.

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I wish to acknowledge the Department of open learning campus for according me a chance to study this course. I appreciate the University of Nairobi's management for creating conducive environment for me to undertake this master's program. I wish to acknowledge the support of my Supervisor Dr. Dorothy Dunge Kyalo for accepting to supervise my project. My parents for their support in the entire period. I sincerely thank God almighty for his strength and grace to do this work for without Him I can do nothing.

Appreciation is extended to my beloved family and friends for financial, emotional and moral support throughout this work.

God Bless You All.

ABSTRACT

The government construction projects are key in the economy of any country worldwide. They contribute to around 10% of the global GDP. Non- delay of a construction project is based on various parameters among them schedule tools, funding, management and environment, requires detailing all the planning requirements. The general objective of this study was to establish how various determinants influence completion of Government Projects in Nyamira County. The specific objectives included: To establish how schedule tools influence completion of Government Road construction projects in Nyamira County, To find out how funding influences completion of Government Road construction projects in Nyamira County, To examine how management influence completion of Government Road construction projects in Nyamira County and To establish how environment influence completion of Government Road construction projects in Nyamira County. The scope of this study was limited to 25 government Road construction projects in Nyamira County. The design of this research was a descriptive census survey design. The population for this study was composed of 35 projects in Nyamira County. The Researcher himself used a questionnaire to collect data. To determine the reliability as well as the validity of the instruments of data collection, a pretest on the of the data instruments was done through a pilot study. The study used both primary and secondary data. The collected data was analyzed using both quantitative and qualitative data analysis methods. Quantitative method involved descriptive analysis. Data from questionnaire was coded using Statistical Package for Social Science (SPSS) version 21. The data was analyzed using descriptive statistics such as means, frequencies, modes and standard deviations. The findings were presented through tables and charts. The study found out that there existed a significant link between schedule tools related factors and the completion of building assignments in Nyamira County. The study found out that there was a strong link between funding information and the completion of building roads in the construction industry. The study found out that management related factors are quite influential in the completion of road construction projects. The study found that Environmental Related Factors determine the completion of road construction projects in Nyamira County. The researcher suggested that studies should be carried out on all Road construction firms to investigate the challenges they face in project planning and implementation

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CHAPTER ONE

INTRODUCTION

1.1 Introduction

Worldwide, stakeholders in the construction industry are worried the time construction projects take to complete in fear of increasing interest rates, inflation and commercial pressures. These delays have the impact to bring about differences which will lead to court cases, claims and jail to the administrators. Most construction projects usually suffer delay and surpass the outlined contract sum (World Bank, 2014). The result of such overrun can at times lead to abandonment of a project. Ideally projects are supposed to run continuously without delays and the responsibilities to keep this in check lies squarely with the project manager and other stakeholders who are linked directly with the projects. Within the project team there should be an outlined strict mechanism discouraging parties to the project from laxity that may lead to stalling or delays (Oyewobi et al.2011). Aon looks at a project like a football hit from one point of the goal and aimed at achieving the objective immediately it enters the opponent's goal; adding up to a score. He further defines the major element of projects implementation called Construction Project Management (CPM) as an approach used in the Road building sector with a goal of increasing efficiency and effectiveness in performance in the management and coordination of a project during its lifecycle.

In a study conducted in the United Arab Emirates, it was found that lack of skilled personnel, slacken leadership, unproven management, uncoordinated supervision at the Site and poor maintenance of the tools and equipment led to the delay in completion of construction projects (Farid and El-Sayegh, 2006). Another study in South Africa investigated the reasons why home owners were not satisfied with the South African Construction Industry and found out that it was because of not having a competent workforce, struggles among workers and contractors and unethical workmanship that led to poor project efficiency (Hanson et al.). It was also revealed by Mbachu and Nkando (2007) that South Africans are not guided by superior project performance in construction nor by good attitude to work on the delivery of projects.

Remon (2013) investigated why there are frequent delays in project delivery. He found out that incompleteness of project is regularly experienced in many building assignments which lead to huge losses on stakeholders. He revealed that projects take more time to complete, use more money than budgeted, have decreased profit, many claims from subcontractors, disaffected clients, incomplete works, end of life projects and expired contractor agreements. All these make the clients disillusioned. Briefings on the stages of construction are part of better way of effecting action and completion of construction projects, as there are many challenges hindering efficiency of such undertakings, leading to frequent and severe project delays.

In Kenya, unethical behavior and poor approval lines of authority in various Nyamira departments have greatly undermined completion of Nyamira projects (DFID, 2013). The building sector adds about 5% of the Gross Domestic Product as per the Economic Survey and adds about 10% to jobs countrywide (Republic of Kenya, 2010a). In addition, the 2010 constitution in the Bills of rights allows the people to be provided with seamless service (Republic of Kenya, 2010b). Infrastructural development in Kenya takes up to about 10% of the total country budget (Republic of Kenya, 2011).

Muchungu (2012) reveals in his study that though Kenyan consultants are highly trained in the construction industry, projects undertaken in Kenya are far from meeting the key performance indicators. The proof is found in many uncompleted projects, schedule tools overruns, inefficiency, lack of maintenance of projects, dilapidated roads, non-superior workmanship, collapsing bridges in various Counties, dissatisfied owners, unusable projects, lengthened time of project completion and increasing costs for project completion.

According to Xia, & Chan (2012) a building process is normally chronological; some contractors are not involved in all parts of the project but deal with sections. The challenge arises when the projects becomes bigger and complex and stakeholders become worried. Various construction works are given to contractors depending on their competence in dealing with certain risks. An investigation conducted on not less than 3000 projects with quality issues, found that the cost of poor workmanship was about twenty percent of the overall costs and seventy percent of issues are discovered at the initial part of the project from substandard work is reduced significantly hitting

a reduction of not less than sixty percent (Turner, 2013). Kenya is endowed with experts in the building industry. This has led to a mushrooming, well established and growing building industry. With a booming populace in Kenya, jobs have been created via building of residential homes, trading construction, fabricated housing construction and erecting skyscrapers for businesses.

Nyamira County is a devolved unit of the national Nyamira which is independently put in place to conduct various development projects at the grassroots level. The Nyamira County Development Report, 2014 showed that many road construction projects were scheduled to complete by 2014. However, this was not achieved since a quarter of those projects were completed while three quarters of them were described as ongoing. Such slow rate of implementation is occasioned by a number of factors which may include contractors' inadequacies, lack of project plans, uncoordinated site supervision, incompetence of lead managers, ineffective procurement and unfavorable economic conditions among others. Thus this research seeks to establish schedule tools, funding, management and environment affect influence the completion of Nyamira construction projects in Kenya particularly Nyamira County.

1.2 Statement of the Problem

The County Nyamira of Nyamira through the Department of Transport, Roads and Public Works is mandated to construct and maintain roads in the area. The County is becoming increasingly concerned about the time construction projects take to complete in fear of increasing interest rates, inflation and commercial pressures. Many road contractors whether from the Nyamira agencies or limited local firms have failed or perform insignificantly on their performance, specifically in the construction and maintenance of roads. The underperformance has called for the County Nyamira attention, forcing it to come up with performance contracts and even settling on an authority to oversee the contractors 'performance'.

In the construction Industry, building of roads is inefficient because of misuse of finances and lack of good customer service to the road consumers (GoK, 2012). Worse still, systems to monitor delivery of the road construction are not capable to solve the challenges afflicting the sector. Road contractors underperform mainly due to the problems associated with resource management and

even political interference (Ugwa and Haupt 2007). Other reasons attributed to incompleteness and underperformance include poor management of the minimal resources available, low levels of technology that make the whole exercise very expensive, politics and many more.

Apart from the above there are various parameters that will lead or hinder performance like Road construction leadership, stakeholder coordination, evaluation and monitoring, feedback and management expertise. Failures and problems of contractor performance in Nyamira County are mostly attributed to economic, environmental and socio-cultural issues like politics.

Previous studies for example, by Musa (2012) on effects of total quality management on performance of Companies in Kenya a case study of Interbuild Company Limited. He found that human resource management and resource management affects performance of the building company to a great extent.

Musa (2012) investigated the reasons why building projects fail. He studied TQM and its effect on completion of construction projects. The study found out that for companies to perform, it would be as a result of prudent resource supervision and proper personnel administration. He did an in-depth analysis of Interbuild Company Limited. Another study carried out by Bundi (2011) investigated KeRRA to find out the shortcomings of its services in the procurement department. She found out that KeRRA activities are affected majorly by politics and insufficient finances allocated to them. Political influence and lack of resources affect KeRRA assignments even though they are implement all the policies effectively. Implementation of projects by PPDA meet a lot of issues ranging from awareness deficit to ineffective and inefficient dissemination of information. This is what Nyamwaro (2011) got when he investigated the problems facing PPDA on the implementation of building projects in the Ministry. Even with the immense study based on the construction of roads and their affiliates, not much has been done on the determinants affecting the delivery of Nyamira road construction projects in Kenya particularly Nyamira County. Thus, this study aims to bridge this knowledgeable gap by seeking to survey the determinants influencing the completion of the construction of Road projects in Nyamira County.

1.3 Purpose of the Study

The aim of this research was to examine how various determinants affect the completion of Nyamira Road Construction Projects in Nyamira County.

1.3.1 Study Objectives

1. To investigate how schedule tools influence completion of Nyamira Road construction projects in Nyamira County.
2. To find out how funding influences completion of Nyamira Road construction projects in Nyamira County
3. To examine how top management influence the delivery of Nyamira Road building assignments in Nyamira County.
4. To establish how the environment influence the delivery of Nyamira Road building works in Nyamira County.

1.4 Research questions

1. How do schedule tools influence completion of Nyamira Road construction projects in Nyamira County?
2. How does funding influences completion of Nyamira Road construction projects in Nyamira County?
3. To what extent does top management style influence completion of Nyamira Road construction projects in Nyamira in Nyamira County?
4. How the environment influences the delivery of Nyamira Road building works in Nyamira County?

1.5 Significance of the Study

This study is significant to project managers since it may equip them with necessary information to alleviate delays and successfully deliver projects on planned time and cost. This will promote efficiency and facilitate implementation of projects.

The study is significant to the County project contractors as it may enable them determine the factors leading to implementation of projects in the County and thus determine all variables that

are outlined to ensure projects are implemented in the County. The study may assist Nyamira to identify and remove blockades in policy and create favourable environment for successful project implementation. This will in turn give Nyamira value for money and improved service delivery.

This research will contribute immensely on breadth and width of knowledge and development of theory by researchers. The findings might be used as a base for more research by scholars. Scholars and experts in Research will benefit by getting more information in the construction industry will help them teach construction. Contractors will be appraised on this information to enable the execute their work in time. Further the result from this research will be important to other researchers and scholar as literature review for research and academic work

1.6 Delimitation of the Study

The study was conducted within Nyamira County. The study was restricted to four determinants of implementation of Nyamira funded projects in Nyamira County. They included: Scheduled tools, funding, management, and environment. This study collected information from top management staff of Contractors, Contractor Consultants, and Ministry of Road Engineer, Engineers from Nyamira County, Technical Auditors, Community Representative and KeNHA

1.7 The Study Limitations

This study was done in an area with scanty infrastructure development. The County lacks basic infrastructure services and the researcher spent more resources to collect data. The researcher engaged research assistants to collect data and employed available technologies to prepare the study report. Before deployment the research assistants were taken through a pilot training by the researcher to enable them understand their duties in the field. Two research assistants were involved.

Data collection was done in the field. This was where the researcher met the respondents and took some time to complete. In the process, some respondents did not avail themselves to fill the questionnaire at the agreed time and, hence rescheduling had to be arranged. Research is very expensive. Costs were incurred in travelling, accommodation and employment of research assistants.

1.8 Definition of Terms

Schedule Tools	Safeguards to monitor exhaustion of the budgeted figures to ensure that strategic assignments proceed without hindrance
Funding:	Supply of necessary funds for project implementation. These are funds from Nyamira and/or donors.
Management	Good implementation and supervision of state funded assignments and resources in an efficient and effective way when applied to the projects intended.
Environment	Environmental variables include cultural, economic, physical, social, political, aesthetic, financial, legal, institutional and technological factors

1.9 Organization of the Study

This research project was arranged into five major sections. Chapter One contained introduction, background of the study, statement of the problem, purpose of the study, objectives of the study, research questions, justification of the study, significance of the study, limitations of the study, delimitations of the study and definition of significant terms used in the study. Chapter Two comprised of reviewed literature of related studies done by other researchers who covered on schedule tools, funding, management of road projects and environmental issues affecting road projects. It also captures conceptual framework. Chapter Three included the introduction to the research methodology, the study design, the study population, Size of the sample, sampling procedure, data collection instrument, pilot study, data collection procedure, data analysis procedure and taking into account ethical issues of the research and operating variables. The fourth section delved to data analysis, presentation and interpretation of the data. A summary of results, detailed explanation, conclusions and suggestions for further research including recommendations were covered in Chapter Five

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter looks at information from past related to the determinants leading to the completion delay in road construction projects in the world and Kenya with specific emphasis on the roads construction projects in Nyamira County. This section will be guided by the four study objectives organized into various sub topics. The necessary background will be an overview of previous work on related topics for the purpose of this research.

2.2. Concept of Completion of Nyamira Road Project

Worldwide the building sector in Roads contributes heavily in the growth of the economy in terms OF GDP, creation of jobs, resource generation and the interrelationship amongst other fields (Hillebrandt, 1985). However, in most Nyamira funded road construction projects it does not count. A report published by the world bank on the state of redoing the major urban roads in the Tennessee Valley USA after the deadly Tsunamis insisted on only two major factors that will be central in determining the time a project will take to be effectively constructed. The two aspects key to every construction contract according to the World Bank (2012) are time and money.

Other previous same studies done in Malaysia and Madagascar. (Piper, 2011) found out that between 1999 to 2007 up to 71% of the roads and other construction projects that in a way failed or took longer than planned for or changed the dates of commencement than the planned dates were as a result of squeezed financial allocation and the contractual times agreements that were never practical. Citing the repair of the main road linking the major international airport in Madagascar and the capital city's CBD took long by 3 years between 2008 and 2011 due to limited financial resources and the then political unrests due to coups.

A study that looked at the projects delayed in East Africa focused on major road projects that links Kenya, Tanzania, and Uganda and by extension Burundi in 2011 and found out that the Nyamiras of Kenya and Uganda were affected up to the tune of 45% roads construction projects (GOK, 2012). Among the cited hindrances include the poor financial management, corruption, limited

financial resources due to project finances diversions etc. Gaba (2013) argues that, in Nyamira projects like those managed by KRB, KeRRA, KURA, KeNHA etc. Contractors employed to undertake the execution of the Nyamira funded Tertiary Institutions projects are therefore selected and awarded the works having portrayed competence and excellence (Waihenya, 2011). For projects to be completed within time, costs and meet specifications, all those involved in project delivery have to give their quality services, workmanship has to be to the highest standards and within specifications. Tertiary Institutions act as bridging gap between those from primary schools aspiring to join Institutions of higher learning, either on full course or part

2.3 Schedule Tools on Construction of Road Projects

A big number of state financed building assignments are affected by resource availability challenges at the period of their execution. In the state run departments all financial estimates are allocated per department. There should be some safeguards to monitor exhaustion of the budgeted figures to ensure that strategic assignments proceed without hindrance. According to Holland et al, (2009) the fear for funding monitoring accuracy in the estimates appear to have impacted the significance of organization's estimates. There exist many program possibilities that need to be soundly assessed in two ways. These include a cost/benefit analysis which is not applied rigorously on the substitutes to enable proper and efficient implementation and comparison. According to Porter (1985), he opines that if only costs and benefits are of project implementation are looked at with doing strategic evaluation of risks involved, then one is likely to pursue the unfavourable tasks and unable to look for the possibilities that are not risky. The selection of a possible alternative plan should be emphasised on greater and tactical flexibility. However, a shallow undertaking on financial analysis often takes place which cannot withstand strategic flexibility.

Another way of economic monitoring by aggregating strategic programs together into an overall package. Many organizations do not consider already available assignments when selecting the final package of the strategic programs (Graham and Englund, 1997)

2.4 Funding and Completion of Road Projects

According to Rahaman (2011), in his study, found out that during the execution of a building procedure funding does not feature, but lack of resources for the construction impact each section of the process. Adequate and timely funding is essential for project success. Inadequate funding and untimely funding may interfere with implementation schedule of projects. Brown, & Phua, (2011) identifies lack of contractor funding as major contributor to delays in Nyamira sponsored assignment. He further defines contractors' financial difficulties as the contractor lacking enough funds to put into building assignments. The funding is meant to pay workers, purchase materials and hire tools. Building firms face resources challenges from three main inefficiencies, inadequate profits, misappropriation of collections and a lot of liabilities and inadequate funds (Thornton, 2007). In 2005 and 2007 there were little money collected and this made the firms constructing receiving meagre funds and thus delaying payment by the clients.

Akinsiku, Akintola, Ameh, & Ige, (2014) in their study also agreed that late payment by the stakeholders to the contractor leading to inadequate funds and delays. With inadequate funds most of the building tasks cannot go on due to lack of funds and hence delays. In Egypt, the main reason of late completion of assignments is considered to be lack of funding (El-Behary, 2013)

Aiyetan, Smallwood, & Shakantu, (2011) in their study came up with funding challenge which played a major role in building late completion in Nigeria.

One of the most serious source of financial distress amongst the builders as found out by Kaliba et al, (2009) is lack of enough funds. Without tight control management on finances by the contractors brings about inadequate funds (Auma, 2014). Thus the contractor will be faced with funding challenges due to high debts since they are unable to service their liabilities. Several factors as postulated by Mahugu (2012) affect the performance of state funded executed projects. Most are, but not limited to personnel conditions, location conditions and funding factors and

design configurations. These same factors play an important role in the performance of the County financed Road construction assignments in Nyamira County.

2.5 Top Management and Completion of Road Projects.

Projects are supervised and administered by use of different knowledge, skills and trainings. Without personnel with the right training to be applied in managing different tasks, then the assignments are bound not to be delivered satisfactorily in each of the phases of development. Good implementation and supervision of state funded assignments is hampered if the resources are not managed and controlled efficiently and effectively and applied to the projects intended. This will enable an improved and unaffected flow of project development. Most projects require teamwork. Teamwork enables management of issues which cannot be handled by subordinates. This will also enable continuous flow of work without interruptions when other personnel are not available (Holland et al.2009). Monitoring coupled with effective information disbursement is critical in managing projects. Since projects are don in stages, any disruption of information flow can affect the work with the phases or the whole assignment (Andersen, 1995). With a procedure in place to mitigate disputes, issues that arise bat the infant stage of the project will be resolved early (Lamont, 1999). By following tight schedules as the project progresses leads to project timelines being met. Project stakeholders do follow strict construction procedures put in place by management in order to meet obligations of the agreement, quality production, reduce risk and safety requirements (AI- Meshekeh and Langford, 1999)

Knowledge, experience and skills in managing building projects is critical in supervising guiding subcontracted firms, help in planning and scheduling programs, managing costs, public interaction, Organizing, leading and manpower linked issues to the works.

According to Brown and Phua (2011), collaborated that professionalism in the construction industry enables the actors to direct and guide use of different cadres of workers, components, skills and tools whose application in the building industry operations is on each day (Brown and Phua, 2011)

2.6 Environment and Completion of Road Projects

Construction time performance is determined by scope, complexity and environmental factors. Environmental variables include cultural, economic, physical, social, political, aesthetic, financial, legal, institutional and technological factors (Ahuja & Naidakumar, 1985, Bennett 1985 and Walker, 1995). Computer programs such as ms project and sure track, accurate time schedules can be produced. Productivity is work output over a given time duration. According to Talukhaba (1988), time taken and cost incurred to complete a project are the prevalent ways of project success 73% time overruns and 39% cost overruns. Sidwell (1984) and Seboru (2006) client involved in project had far-reaching effects on satisfactory completion of project. Established construction required by approaching profits. Successful rationalization in building industry requires exam of design and construction process together and their development as an organic whole. Link design and production with contractual procedures and whole process treated as one (Sidwell, 1984 and Seboru, 2006).

Some causes of uneconomic work include; Travelling long distances to and from work, awaiting directions and components, late entry to project site, bad weather, a lot wastage, inefficient procurement system and poor market structures, changes made to scope and design coming after starting the work, poor record keeping and management. Frosdick (1997) cites Thompson & Wildarsky (1986) socio-cultural differences in the company results in certain facts of the project abandoned in different ways. Basic types are hierarchists or entrepreneurs, egalitarians, fatalists or bureaucrats and individualists. This he refers to as social complexity (Frosdick (1997) cites Thompson & Wildarsky ,1986). On perception, Gilmer (1970) gives set, influence and learning as the major contributors.

2.7 Theoretical Framework

This part looks at the relevant theories on the research variables. The section reviews theories related to the research study being undertaken.

2.7.1. Management by Objective Theory

Drucker (1954) initiated what came to be called management by objective (MBO). His theory is based on assimilating different levels of hierarchy in organization. Drucker opined that

organizations exist for a reason, and as such the top leadership is supposed to set goals and objectives that are common for the company. This approach brings about the feeling that goals and objectives are moved from one level of the organization to the next through discussions. Different cadres of staff in the organization meet to compare goals and measures that they deem critical for accomplishing organizational tasks. When the objectives and measures of performance including completion deadlines are finalized, the subordinates then obligate themselves to auctioning and achieving those goals without which they are held responsible. The underlying theme in MBO, is teamwork in setting up goals, objectives, measures for monitoring performance, choosing the direction the organization takes and how they arrive at organizational decision.

The Nyamira has timelines for completion of construction projects, but this is inadequate because contractors take long to complete road projects due either lack of funding or frequent variations. Delays in road construction projects is persistent even with timelines defined. A measure of success only occurs when completion of road construction projects is executed on time. What is witnessed in many countries and Counties in Kenya is rampant delays of Nyamira sponsored projects some of them left abandoned half way to completions. The MBO theory brings an angle of teamwork in executing projects. The theory supports teamwork as the fuel to successful completion of Nyamira road construction projects

2.7.2. Project Management Competency Theory

The competence theory came to the fore in the 1980s. Competency is the power characteristics in an individual that leads admirable performance on tasks. Theory was founded by McClelland & McBer. Other proponents of competence theory include Crawford (referenced in Boyatzis, 1982 & Spencer, 1993), who postulated that competence incorporates knowledge, skills, noticeable performance, and core personality characteristics. A study done by Crawford (2010) found out that most managers don't possess the required competencies required to accomplish construction of Nyamira projects to satisfaction. According to Beer (1990) and Smith (19776), it is assumed that people with knowledge, right skills and training can lead and manage projects and organizations effectively and successively. Competence is always regarded to superior tasks execution and efficiency. This theory is critical in road construction completion in Counties. It is only when the project teams are competent in their work can they execute projects to completion.

The project leaderships should have the right knowledge, skills and training to be competent to successfully lead projects to completion to avoid delayed delivery. The project management competency theory supports completions of road construction projects through engagement of competent managers to lead project teams.

2.7.3. Financial Distress Theory

According to Brigham & Ehrhardt (2013), the slowdown of an organization's performance is caused by various parameters which the financial distress theory tries to uncover. The state of inability of an organization to service their debts before maturity is termed as financial distress (Beaver, Correia, & McNichols, 2011). The connection between the movement of funds and being able to utilize the funds in proper business assignment or tasks is referred as to financial distress. Before an investment opportunity is initiated, there should be proper planning, communication and enough funding for the project, otherwise the assignment should not be started all. During the pre-initialization phase companies should note the duration release of the funds will take before they embark on the project or agreeing on the start dates. This is critical to avoid late completion of projects due to late financing. Firms with complex construction assignments are supposed to fund them. If they don't finance them then the building tasks are not delivered on schedule. This theory thus looks at and is critical for mitigating issues impacting late project completion in organizations. The major reasons why building firms have funding challenges include, understated budgets, late disbursements and delayed financing which lead to incomplete delivery of projects. Thus the theory of financial distress gives direction to the understanding of the project funding on the extent to which finances influence project delays of Nyamira construction projects.

2.8 Conceptual Framework

The relationship between independent variables time Schedule tools, funding, management and environmental issues that impact on Nyamira Tertiary Institutions as the dependent variable are illustrated in Figure 1 conceptual framework.

Independent Variables

Dependent Variable

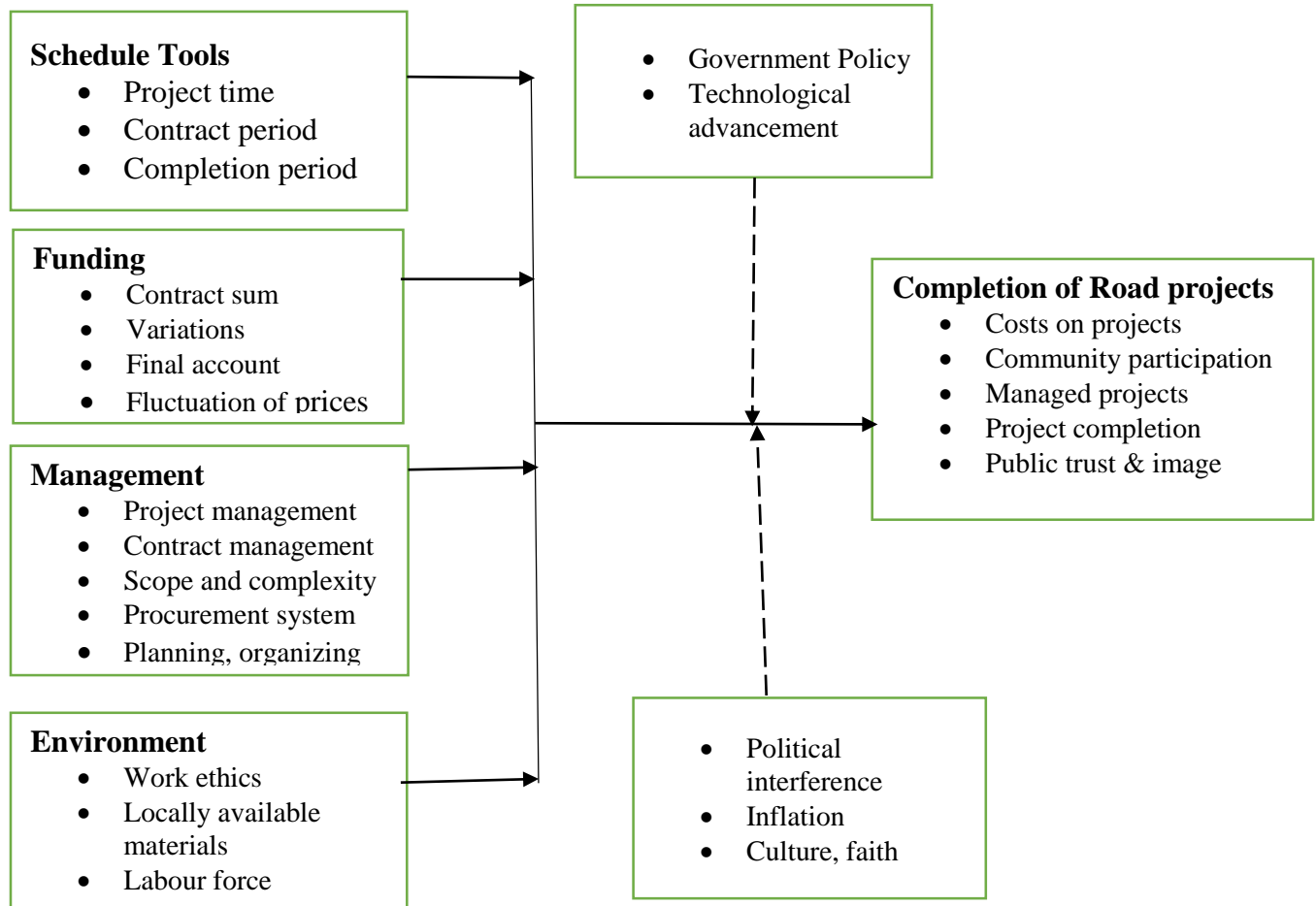


Figure 1. Conceptual framework

Schedule overruns affects the overall project cost in terms of financial claims on preliminaries items which are either fixed or time-based, such as insurances, security, water and electricity, performance bond, transportation of materials and human, office staff and the like. Overspending give a general feel that consultants are incompetent, contractor is inexperienced or financial support would be continued or withdrawn in case of donor funded projects or joint venture. On Management of projects, Project managers or Architects are experts or lead consultants who issues and approves instructions and variations; Quantity Surveyors, who are experts in cost matters and who advises on cost implications; engineers both services and civil/structural affects quality and

cost, which is directly related to project period/time. Clients representatives cause changes, irrespective of the financial constraints. Contract management with parameters such as the main contractor, subcontractors, and contractor's superintendent on site, management style and experience in handling projects affects completion of projects in time and cost, which impact on project delivery. Environmental issues such as cultural disparity, differences and their effects on work ethics, performance and perception of work affect delivery of projects within parameters of time, cost, scope and specifications. Material availability locality and weather also play a key role in Nyamira Tertiary Institutions.

All the above variables affect the final outcome or completion of Nyamira road project. Nyamira budgets are done once every year, probably in the months of June or July. Cash-flow of the projects is usually tied up as parent ministries have to file returns and account for unused funds. This in turn affects project delivery. When interventions are put in place, there should be reduced cost of projects, projects delivered or completed in time, which should meet client and public satisfaction and gain public participation and co-operation in development agenda of the Nyamira. It should also improve management skills as well as harness learned skills from projects that meet required parameters.

2.9. Knowledge Gap

In majority of the studies done and reviewed so far, few researchers have comprehensively looked at the contractor's side of cost and time overruns management and environmental issues in projects. There has been a tendency to sideline the roles of contractors and blame them solely as the contributors to time and cost overruns in the guise that they are business-minded and have no recourse for others or consequences that may result in default (Mbatha, 1986). JBC and PPOA conditions of contract allow some lee-ways for extension of time, but on condition that the issues are raised as early warning to the consultants, at whose discretion the award is pegged. The consultants at no time can incriminate themselves, either verbally or in writing if they default on their end of issuing instructions or late instructions. The contribution of the contract manager and project manager has also not been given much attention. Project management is a recent discipline and not as well advanced in development as other disciplines. The contractors' superintendents

have big role to play in interpreting and actualizing instructions given, clear understanding of projects and reading of drawings, specifications and details.

Nyamira has been in the past funding its projects from public coffers. New system of partnership has emerged where donors channel funds or aid but directed towards projects. The Nyamira meets about 10% of project cost and the donor finances the rest. Such has been the case of funding of Institutional developments such as colleges and upgrading of colleges to university status, requiring upgrading of structures therewith (MOPW, 2012). Not much has been documented on this system. The role of consultants in projects has been emphasized by many scholars. This however has left out client's representatives who issue instructions to the contractors directly, with no much consideration on cost impact that the instructions would have on the overall project. This affects project delivery time and creates issues to the project management. Striking a balance between quality, time, scope and cost thus becomes a concern to all parties in projects. They are inter-related and inter-dependent. Cost and time overruns are directly related in projects where one affects the other. Managerial skills and competencies reflect on overall project delivery. The environments under which Nyamira Tertiary Institution projects are delivered affect their actual delivery. These projects are implemented to meet specific needs, thus the reason for the study on how to enhance delivery.

2.10 Summary of Literature Review

Scholars worldwide have studied determinants that are responsible for late delivery of building assignments. Since most budgets are based on operating departments, it is important to superimpose key non-dollar factors that would signal whether the strategic programs are proceeding on schedule. Financial problems rise from subdued collections, poor returns to investment and inadequate capital brings about financial problems among construction firms (Thornton, 2007). Late or delayed payments from the clients always lead to financial distress to the contracted companies (Akinsiku, Akintola, Ameh, & Ige, 2014). This leads to some construction slowdown on Nyamira projects. In Egyptian construction projects financing is the major factor that causes delays in completion of projects as postulated by El-Behary (2013). Construction time performance is determined by scope, complexity and environmental factors. Environmental variables include cultural, economic, physical, social, political, aesthetic, financial,

legal, institutional and technological factors (Ahuja & Naidakumar, 1985, Bennett 1985 and Walker, 1995). In Kenya, delays in completion of Nyamira projects are caused by misappropriation of finances and inadequate information amongst the public sector (DFID, 2013). Therefore, in relation to the above, the chapter has highlighted the literature that is existing in relation to the delivery in the road building sector. The chapter has reviewed the literature in relation to the four objectives and the determinants have been looked at from the global perspective down to the study scope area. Among the highlighted determinants include: Projects Funding, Project Schedule tools, Project Management and Project construction Environment that are considered to be independent variables while completion in road building works implementation in the building sector is a dependent variable. The chapter also highlights the conceptual framework, relationship between variables and research gaps.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Chapter Three deals with the methodology of the study. Included in this chapter are design of the research, targeted population, Size of the sample, procedure for sampling, instruments for data, validity and reliability, procedure for data collection, data analysis and presentation, ethical issues and organization of the variables.

3.2 Research design

A research design describes how the study addresses specific aims and objectives of the research (Mugenda & Mugenda, 2012). This study used a census design. A descriptive census survey provided this study with an appropriate procedure for examining the causes that lead to the delivery of Nyamira Road building projects in Kenya particularly Nyamira.

3.3 Target Population

The study targeted all the Nyamira Road Construction projects. There were 162 Nyamira road construct projects in Nyamira County (Nyamira County, 2015). The target population of the study was 35 Road construction projects in Nyamira County and finalized from 2011 to 2015. The range from 2011 to 2015 is supported by Ika et al. (2011) who argues that Nyamira projects normally take three to five years to complete, but the financing can take five years to the total project completion. In this research the target population was 35 Road construction projects. The respondents were top management staff from Contractors 10, Contractor Consultants 5, Ministry of Road Engineer 5, Engineers from Nyamira County 5, Technical Auditors 2, Community Representatives 5 and KURA 3.

3.4 Sample Size

The research was a census survey design with respect of the unit of analysis which is the Nyamira Road construction project in Nyamira County. This therefore ruled out the application of any sampling procedure. Since the population of 35 was small and the study aimed to cover all the 35 Road works, the researcher used a census study. This methodology was preferred since Orodho (2009) postulated that data collected through census gives an unbiased data that takes into

consideration all the participants opinion on the problem being investigated. Census design provides a true measure of the population since there is no sampling error and more detailed information about the study problem within the population is likely to be gathered (Saunders, 2011). This study collected information from top management staff of Contractors, Contractor Consultants, Ministry of Road Engineer, Engineers from Nyamira County and Technical Auditors, Community Representatives and KURA. Top management staff were respondents because they were the decision makers, information rich and involved in a day to day operations.

3.5 Research Instruments

In this research a questionnaire was used to collect both primary and secondary information from the respondents. The researcher administered the questionnaire herself. The questionnaire had both closed and open ended questions. Certain specific responses were collected by open ended questions only. Questionnaires are very economical in terms of time, energy and finances. Similarly, it yields, quantitative data which are easy to collect and analyse (Kothari, 2004)

3.5.1 Pilot Study

Few questionnaires were taken and given to few respondents to fill and respond to the questions. After the exercise the questionnaires are checked by the researcher and supervisor to check whether the questions were correct as intended for the main research. The pilot sample had 5 staff from among the target population who were selected randomly.

3.5.2 Data Instruments Validity

When the results are gotten from an analysis and they actually represent the items being investigated, then validity has been assured.

Validity was ensured when objective questions are included in the questionnaire and by pre-testing the instrument used to identify and change any ambiguous, awkward, or offensive questions and technique as emphasized by Cooper and Schindler (2003). Opinion from experts were sought on the representativeness and suitability of questions. The experts were give suggestions on corrections to be made to the structure of the research tools. This helped to improve the content validity of the data that was collected.

3.5.2 Reliability of Instruments

According to Mugenda & Mugenda (2003), reliability is measured by consisted results from instruments. It is achieved through pre-testing the research tools to assume their reliability, word arrangement structure and how questions follow each other. The data collection instruments were put into reliability analysis under a procedure called split half technique. This process involved getting data from two groups in halves often odd and even and correlated by Pearson's correlation. According to Trochim (2005) a coefficient of 0.7 or more shows that there is a high data reliability. The reason for doing this is to improve the research tools for the major main research to ensure there is no problem in filling and answering the questions for the same responses.

3.7 Data collection Procedure

This research embraced both fresh information collected from the field and information archived in the institutions by use of questionnaires. Primary data are collected afresh and for the first time and thus original in character (Kothari, 2010). The respondents were the Project managers in Nyamira County. The questionnaire was divided into section A, covering demographic variables and B, covering study variables. Secondary data was collected from archived data in Nyamira County. The data was from literature sources or data collected by other people for some other purposes

3.8 Data Analysis Techniques

The data was analysed through use of means, frequencies, modes and standard deviation. The results were presented using tables. The collected data was arranged in various variable themes and coded. After this the study used the mean and standard deviation to analyse the data. Finally, tables were used to present the data for comparison.

3.10 Ethical Considerations

In this study, ethics revolved on confidentiality, voluntary participation, objectivity, honesty voluntary participation, non-discrimination and respect for intellectual property. On confidentiality, the researcher assured respondents that the data was used for only academic purposes and nothing else. The researcher assured the participants that confidentiality will be kept and strictly adhered to on those who voluntarily gave study information. The researcher strove to

maintain truthfulness in reporting data results by ensuring that there is no fabrication, falsehood, or any misrepresentation of data. The researcher avoided bias in experimental design, data analysis, data interpretation, peer review, and expert testimony among others. The researcher all forms of rights by accrediting and acknowledging the contributions from various parties. The researcher avoided discrimination against respondents on the basis of sex, race, ethnicity, or other factors that are not related to their competence and integrity.

3.11 Operationalization of Variables

Table3. 1: Operationalization of Variables

Objectives	Type of Variable	Indicator	Measuring of Scale	Type of analysis
Establish how schedule tools influence completion of Nyamira projects	Schedule Tools	-Late instructions -Material order delays -Complexity -Procurement system -Timely project delivery -Project completion on budget -Project specifications change -Projects not delivered to clients satisfaction -Client“ involvement	Nominal ordinal	Descriptive: Central tendency
Find out how funding influences completion of Nyamira projects	Funding	-Delays in approval of budgets -Variations -Fluctuations/inflation -Authorization of variations -Higher final account	Nominal ordinal	Descriptive: Central tendency

examine how management influence completion of Nyamira projects	Management style	<ul style="list-style-type: none"> -Expertise -Handling similar projects -Ethics -Managerial system/ experience -Education -Interpret drawing -Correctly order material -Note variations -Ask for clarifications in case of discrepancies -Experience in people management 	Nominal ordinal	Descriptive: Central tendency
establish how environment influence completion of Nyamira projects	Environment	<ul style="list-style-type: none"> -Culture/customs -Laziness & Laxity -Work ethics -Quality conscience -Material not available -Motivation 	Nominal ordinal	Descriptive: Central tendency
Completion of public sector projects	Completion of public projects	<ul style="list-style-type: none"> -Scope -Quality -Output -Community perception 	Nominal ordinal	Descriptive: Central tendency

CHAPTER FOUR
DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

Chapter four analyzed data collected from the field by use of the questionnaire, presented the analyzed data through tables and interpreted it. The section uses descriptive values, frequency tables and percentages. The responses were presented, followed by an interpretation guided by the study objectives and a discussion on research findings from the analysis of the data.

4.1.1 Study Response Rate

The questionnaires were administered to 35 respondents of which 30 respondents filled, completed and returned.

Table 4.1 Response rate of the study

Respondents	Frequency	Percentage
Responded	30	86
Non-Response	5	14
Total	35	100

Table 4.1 indicates a response rate of 86%. The response rate of 86% is excellent for this research. The collection procedures involved personal administration, reminder and personal collection whenever possible. As for the 5 non-response questionnaires, this can be attributed to the inability by the respondents to complete and return them by the end of time given for responding to the items.

4.2: Background of the Respondents

4.2.1 Respondents Gender

The respondents were tasked to indicate their gender. This showed the nature of gender composition in the road construction industry. Table 4.2 illustrates gender profile of the sample.

Table 4.2 Gender of Respondents

Gender	Frequency	Percentage
Female s	4	13
Males	26	87
Total	30	100

Table 4.2 indicated majority of those who filled the questionnaire were males (87%) and (13%) were females. The observation shows the skewed nature of the distribution of the available gender in the construction industry which has been historically dominated by men. This gives a wake-up call for women to be more involved in construction and management of projects.

4.2.2 Respondents Age bracket

The respondents were asked to indicate their age. Five categories were given and the following table indicates the age brackets

Table 4.3 Age of Respondents

Category age	Occurrence	Proportion (%)
20-29	8	27
30-39	8	27
40-49	10	33
50-59	3	10
60-above	1	3
Totals	30	100

Table 4.3 indicated majority of those who returned the questionnaire (33%) fell in the bracket of 40-49 years while only a small percentage (3%) falls in the age group bracket from 60 years and above. The analysis indicates that the Road Construction industry is dominated by the middle aged who are strong and energetic to carry out the works. The old generation cannot cope with stress associated with this industry. Additionally, it shows the generational change to young and energetic leaders.

4.2.3 Education Qualification

The participants' highest level academic qualification. Table 4.4 shows the level of qualification of the Respondents

Table 4.4 Education Level

Education level	Frequency	Percentage
Degree	5	17
Masters	17	57
PHD	8	26
Total	30	100

Table 4.4 indicated majority were Masters degree holders (57%). Following closely were those with PHD education (26%). Undergraduate degrees holders were few at 17%. This indicated that top management of construction industry held by highly educated people.

4.2.4 Registration by Class

Those who participated in the study were asked their current registration class. The analysis is presented in the below (Table 4.5)

Table 4.5 Registration Category

Category	Frequency	Percentage
A	17	57
B	7	23
C	2	7
D	3	10
F	1	3
Total	30	100

The table above indicated that class A had (57%), followed by B (23%), D (10%) and C (7%) respectively. Class F had a small (3%) of the respondents who could be a small scale contractor. Due to magnitude and complexity of qualification for Nyamira funded projects, small scale firms rarely qualify for such projects. Class F is the lowest category and the highest class is “A”. The progression of classes F to A for the firm indicates the growth path and the level of experience of the firm over time. More competent contractors are engaged in the Road Construction industry than those in lower levels by Nyamira.

SECTION TWO: DETERMINANTS OF THE COMPLETION OF ROAD CONSTRUCTION PROJECTS

4.5 Schedule Related Factors

The study was interested in investigating the influence of various schedule tools related factors on the completion of Road construction projects in Nyamira County

Table 4. 6: Rating of Schedule Related Factors

Schedule tools factors	Mean	Standard Deviation
Period of Site Possession	3.3581	0.9331
Project Commencement Date	3.1272	1.0782
Completion Date	2.9821	0.8673
Respondents’ Opinion on time Allocated for Projects	3.8226	1.1232
Contributors of Project Delays	3.7225	1.0865
Effects of Project Delays	3.5912	0.9621
Nature of client (Funding and organizational structure)	4.6642	0.8133
Client’s skills on project organization	3.3444	1.0427
Owner ‘s construction sophistication	4.1234	1.3615
Design team experience	3.8876	1.1644
Adequacy of planning and specification	3.6358	1.0907
Experience of contractor	3.1636	1.2015
Managing the site	3.4012	0.8655

Table 4.6, shows that majority of respondents indicated the type of consumer was rated to be significant to a very great extent in determining the completion of road projects as shown by mean scores of 4.6642; Owner ‘s construction sophistication was found to be significant to great extent as shown by a score of 4.1234. Further, Design team experience is highly significant to great extent having a score of 3.8876 and adequacy of plans and specifications significant to a great extent as shown by a mean score of 3.6358. The respondents rated Site management to be moderately significant in the completion of building projects as shown by a mean score of 3.4012, while client ‘s knowledge of construction project organization, Contractor experience, Period of Site

Possession and project Commencement Date were rated to be moderately significant in the completion of constructing road projects as shown by mean scores of 3.3444, 3.2636, 3.3581 and 3.1272 respectively. Completion Date was rated to be to be significant to a little extent in the completion of constructing road projects as shown by mean score of 2.9821.

4.6 Funding Information Related Factors

The study further wanted to establish how various funding information influence success of a project within the road construction sector as shown in the table below.

Table 4.7: Rating of Funding Related Factors

Funding Information Factors	Mean	Standard Deviation
Project delivery system	4.2750	1.2501
Project bidding method	4.1978	1.1552
Project contract mechanism	2.6679	0.4667
Control mechanism	4.4488	1.1323
Feedback capabilities	2.3893	0.6260
Troubleshooting	4.1000	0.5898
Quality assurance program	3.5223	0.6757
Safety program	3.1122	1.1630

Table 4.7 reveals that the majority of the respondents indicated that control mechanism is significant to a very great extent as shown by a mean score of 4.4488; project delivery system was also rated to be significant to a great extent as shown by a mean score of 4.2750 as well as project bidding method shown by a mean score of 4.1978, troubleshooting shown by a mean score of 4.1000 and quality assurance program shown by a mean score of 3.5223, while they rated safety program to be moderately significant as shown by a mean score of 3.1122, project contract mechanism to be moderately significant as shown by a mean score of 2.6679 and feedback capabilities to be moderately significant as shown by a mean score of 2.3893.

4.7 Management Related Factors

Management factors also affect the delivery of road building assignments in Nyamira County. This section is dedicated to investigating the effect of management information on the delivery of road building works.

Table 4. 8: Rating of Management Related Factors

Management Related Factors	Mean	Standard Deviation
Communication systems	3.9198	1.2080
Upfront Preparations energies	4.2268	0.8270
Evaluating and following plans	4.4962	0.7235
Making suitable designs	4.1008	1.2754
Managing of subcontracted firms work	3.8198	1.1339
Executing safe actions	2.6520	1.2341
Implementing QA programs	3.2850	1.2324
Coordination effectiveness	3.6824	0.5772
Decision making effectiveness	3.1361	0.7645
Clear objectives and scope	2.8167	0.7936
Team building participation	3.3750	1.1520
Making acceptable procedures/absence of bureaucracy	3.1578	1.1562
Prior project management experience	2.5032	0.7756
Risk identification and allocation	3.5333	1.1422
Formal dispute resolution process	1.3500	0.6012
Commitment to project	4.6855	0.7312
Top management support	3.5000	0.5746
Effective Strategic Planning	2.6500	0.5996
Sufficient financing of project	4.5122	1.0543
Comprehensive Contract documentation	3.2750	1.2301
Up to date technology utilization	3.0871	1.0762

Table 4.8, indicated that majority of respondents showed sufficient funding of project and commitment to project were rated to be significant to a very great extent as indicated by mean scores of 4.5122 and 4.6855 respectively and that evaluation and following up plans is also significant to a very great extent in the success of a projects indicated by mean scores of 4.4962. Majority of the respondents rated upfront preparation planning energies to be significant to a great extent as indicated by a mean score of 4.2158 as well as making suitable designs indicated by a mean score of 4.1008, communication systems reflected by a mean score of 3.9198, managing of subcontracted work indicted by a mean score of 3.8198, coordination effectiveness reflected by a mean score of 3.5834 and risk identification and allocation indicated by a mean score of 3.5333. They further indicated that implementing QA programs is moderately significant in the success of

building projects as indicated by a mean score of 3.3750, team building participation is highly significant in the completion of building projects as shown by a mean score of 3.3750, comprehensive contract documentation is highly significant as reflected by a mean score of 3.2750, decision making effectiveness is highly significant as reflected by a mean score of 3.1361, making acceptable procedures/absence of bureaucracy is moderately significant as shown by a mean score of 2.5032, up to date technology utilization is highly significant as indicated by a mean score of 3.0871, clear objectives and scope is moderately significant as shown by a mean score of 2.8167, implementing safety program is highly significant as shown by a mean score of 2.6520 as well as prior project management experience and top management support reflected by a mean score of 2.5032 in each case. Accordingly, they rated effective strategic planning to be have low extent significance as indicated by a mean score of 2.2500 as well as formal dispute resolution process as indicated by a mean score of 1.3500.

4.8 Environmental Related Factors

In this section, the study sought to find out effect of the environmental on the delivery of road building works in Nyamira County.

Table 4. 9: Rating of Environmental Related Factors

Environmental Issues on Projects	Mean	Standard Deviation
Community Response towards the project	3.7620	0.6231
Community's faith and religion towards the project	3.2801	1.1003
Effect of infrastructure on material delivery	3.1725	0.7662
Material availability		
Stakeholder involvement to the project	2.6286	0.5429
Adequacy of funding	3.3832	1.2180
Technology availability	4.1921	1.0832
Human Skill availability	4.2511	0.9921
X-Factor (fraudulent practices, corruption, favoritism, lack of ethics)	2.7121	1.0453
Economic environment	3.8142	0.52297
Social environment	3.7942	0.43191

Political environment	4.1714	0.37078
Physical work environment	3.3528	0.83703
Industrial relations environment	4.0604	0.76274

Table 4.9, shows that majority of the respondents rated human skill availability as being much significant to a great extent as shown by a mean score of 4.2511, as well as technology availability shown by a mean score of 4.1921, political environment shown by a mean score of 4.1714, industrial relations environment as shown by a mean score of 4.0604, economic environment as shown by a mean score of 3.8142, social environment as shown by a mean score of 3.7942, Community Response is shown by a score of 3.7620 towards the project They further rated the adequacy of funding to be significant to a moderate extent a score of 3.3832, physical environment also rated moderately significant as shown by a mean score of 3.3428, Community’s faith and religion towards the project score of 3.2801 and Effect of infrastructure on material delivery was also rated to be moderately significant. X-Factor to be moderately significant as shown by a mean score of 2.7100 as well as participation of stakeholders’ participation shown by a mean score of 2.6286, while they rated administrative approvals environment as having low extent of significant as shown by a mean score of 2.1714.

4.9 Completion Trend

Table 4.10 Completion Trend

Completion Trend	Mean	Standard Deviation
Cost	2.6679	0.4667
Time	1.3500	0.6012
Quality	3.5223	0.6757
Client Satisfaction	1.3500	0.6012

Most of those who filled the questionnaire and returned rated Quality of the road project completion trend has remained constant over the last five years in Nyamira County as shown by a mean score of 3. 5223. The cost of the road project completion trend has decreased as shown by the mean score of 2.6679, meaning that the cost of completing projects has been increasing over time. This might be associated with inflation, variations and delays. The road construction completion trend for time and Client satisfaction tied at greatly decreased as shown by the mean score of 1.3500 each. This showed that projects have taking more time to complete to the dissatisfaction of the clients,

4.10 Site Road Construction Supervisor

Table 4.10: Project Supervision

Response	Number of Respondent	Percentage (%)
Yes	20	67
No	7	23
Not Sure	3	10
Totals	30	100

The table above, indicated that most of those who filled the questionnaires and returned, agreed that the projects that had supervisors on Site positively influence the rate of road projects completion as shown by the score of 67%. 23% said the supervisor on site does not influence road project completion while 10% indicated they were not sure. This finding underscores the importance of having a supervisor on site while road construction is being undertaken.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSION AND

RECOMMENDATIONS

5.1 Introduction

The chapter details the results analyzed in Chapter Four. A summary of the results and findings from a discussion of key data are included. This section has the conclusion and recommendations derived from the findings. The conclusion and recommendations as derived, are focused on the aim of the research.

5.2 Summary of Findings

The aim of this research hinged on examining the determinants affecting completion of Road building projects in Nyamira County

5.2.1 Schedule Tools and Completion of Road Construction Projects

The study showed that there existed a significant link between schedule tools related factors and the completion of building assignments in Nyamira County. Availability of Human skills, technology availability, political environment, industrial relations environment, economic environment and social environment are much significant in the delivery of Road building works. The study also revealed that adequacy of funding and physical work environment are very significant. X-Factor as well as commitment of all parties to the project are rated to be moderately significant while administrative approvals environment is just significant.

5.2.2 Funding Information and Completion of Road Construction Projects.

The study found out that there was a strong link between funding information and the completion of building roads in the construction industry. The study revealed that control mechanism and project delivery system is highly significant as well as project bidding method, troubleshooting and quality assurance program. The study also ascertained that safety program, building contracting and feedback capabilities to be moderately significant in the completion of building projects.

5.2.3 Top Management and Completion of Road Construction Projects

The study established that management related factors are quite influential in the completion of road construction projects. The study revealed that upfront planning efforts as well as developing an appropriate structure, communication systems, control of subcontractor work, coordination effectiveness and risk identification and allocation are highly significant in the completion of road construction projects. Additionally, implementing QA programs, holding of regular meetings, comprehensive contract documentation, decision making effectiveness, developing standard procedures/absence of bureaucracy, up to date technology utilization, clear objectives and scope are highly significant, implementing safety program is also highly significant and prior project management experience and top management support are highly significant in the completion of road construction projects. Effective strategic planning and formal dispute resolution process are other factors that are quite significant. Further, adequate funding throughout the project and commitment to the project are moderately significant, while monitoring and updating plans are just significant in the completion of road construction projects.

5.2.4 Environment and Completion of Road Construction Projects

The study found that Environmental Related Factors determine the completion of road construction projects in Nyamira County. Nature of client (funding and organizational structure) and owner's construction sophistication, client's project management, Consumers satisfaction on ability of the team involved and client's ability to make decision are very significant in the delivery of road Road building assignment . Client's experience and contracting the right designer/contractor were found to be quite significant. Client's knowledge of construction project organization and Client's ability to define roles were found to be moderately significant in the completion of road projects. Further, design team-related factors, adequacy of plans and specifications and project design complexity were found to be very significant, while accurate initial cost estimates was just found to be significant and design team experience to be moderately significant. It was further established that contractor-related factors such as builders cash movement, Builder knowledge and onsite supervision were very significant; Contractors' effectiveness of cost control system is just significant, while speed of information flow is moderately significant.

On top management variables, their adaptability and knowhow, supervisors TQM awareness, budget estimates and deadlines, supervisor knowhow and organizing skills of the leadership are found to be significant; Construction control meetings, the supervisors acumen plus leadership skills of assignment manager are quite significant; initial participation of top management and regular stakeholder checks on the assignment, staff good spirit, sustaining involvement of participants in the project, the organizing capability of the supervisor and his relationship with the client/ owner representatives, approval on funding usage, appointing capable personnel, etc, and the leadership's daily decisions are moderately significant, but supervision acumen and understanding of top management with builders and sub-builders is just significant.

5.3 Discussion

This study focused on investigating the determinants influencing the completion of the road construction projects in Nyamira County. A construction project is deemed successful if it is completed without budget overruns, before the completion timelines and in accordance with the requirements and stakeholders' approval. The results of this study emphasized that completion factors vary across various projects. This section therefore focuses on a detailed discussion of the major findings of the study which also entails comparing the study findings to the literature in order to come up with comprehensive conclusion.

5.3.1 Schedule Tools Related Factors

With regard to the influence of schedule related factors on the completion of road projects in the Nyamira County, the study revealed that human skills availability, technology availability, political environment, industrial relations environment, economic environment and social environment are much significant in delivering road building assignments. Other factors in this category include adequacy of funding and physical work environment, X-Factor, stakeholder's passion towards the assignment and administrative approvals environment. These findings agree with Walker and Vines (2000) in support of the operating environment as an issue affecting the project completion. A study undertaken by White and Fortune (2002) also concurred with the find that enough budgetary estimated for the life of the project, detailed agreement records, enough capital and adequate capacity, client inputs and a knowledgeable and skilled leadership are critical in carrying out projects.

5.3.2 Funding Related Factors

The study established that the funding related factors have an influence on the completion of road projects. The project team concern themselves with attainment of quality projects which is taken as part of the process used when road building takes place. Various aspects involved here are control mechanism and project delivery system, project bidding method, troubleshooting, quality assurance program, safety program, project contract mechanism and feedback capabilities. These findings correlate well with what Walker and Vines (2000) investigated and found adequate communication, monitoring and control, feedback system in place, handling frequent challenges, sound organization, competent decision delivery, teams arrangements, strictly following laid down programs and similar leadership expertise are components in construction assignments,

5.3.3 Management Related Factors

The study found out that the management related factors also influence the completion of road projects. The management related factors include upfront planning efforts, having a good organizational design, managing work of subcontracted firms, execution of TQM programs, more participatory get together, comprehensive contract documentation, decision making effectiveness, developing standard procedures/absence of bureaucracy, up to date technology utilization, clear objectives and scope is highly significant, implementing safety program is highly significant and prior project management experience and top management support among others. Namur and Kumaraswamy (2007), on their study on delivery of assignments within budget and timelines, found out that effective site supervisory was critical in assignment delivery. They highlighted that increased complexity, uncertainty, and time pressure in building projects have increased the need for cooperation among different project actors.

5.3.4 Environmental Related Factors

From the study, environmental related factors have an influence on the completion of road construction projects. Stakeholders in project development are very critical. Nature of funding, organizational structure and owner's construction sophistication, client's project management, client's confidence in building team and client's ability to make decision are among the factors that influence the completion of the building projects. The customer variables, technical variables,

builder variables and top management variables are severally mentioned to have an influence on the completion of building projects. These findings concur with those of Dissanayaka and Kumaraswamy (1999) who in their study found out that the of the nature of the client, skills they possess, management acumen, funding, teamwork, tools and equipment, ability for risk solutions impacted the delivery of construction projects.

Belassi and Tukel (1996) pointed out that assignment supervisors is a critical in any building assignment and his knowledge and skills help in project information disbursement, timing and monitoring project deadlines and strategic planning. This means that teamwork and consultations are to construction when many stallholders are involved. Assembling all efforts from all participating entities to a contract plays an important role in delivering construction assignments within the timelines

5.4 Conclusions

Globally, the building sector is very important in many countries because of its contribution to their economies. For instance, the sector adds about 10% of world GDP annually. Delivery of construction projects in Nyamira County is, therefore, an essential aspect for the growth and development of the County and the construction projects are inevitable. The study concludes that Schedule tools related factors influence delivery of road building works within budget and time, availability of human skills, technology in addition to the political environment are the most important factors that determine whether a road construction project will complete or not. High levels of afore mentioned factors speed up completion process of any road construction project. The study further concludes that are linked to funding of the assignment have to be considered for any completion of a road project. The control mechanisms of any project and its performance system like bidding of construction works are essential. Funding of the project affect the tendering and procurement processes of the road project which are a key to its completion. It can also be concluded from the study that management factors of a project correlates with its completion time. The coordination of the subcontractor's labor, cost and other functions of the project influence the completion process. The degree of coordination reflects in the completion process of the building project. The study finally concludes that environmental related factors such as the nature off the

client, management of the project and the owners' sophistication give direction of road projects completion. The combination of human related factors from the owners, constructors and the supervisors determine the completion time. for road projects to complete in time there must be proper coordination of the human factors from all the participants of the project.

5.5 Recommendations

From the findings and conclusion, the study recommends a clear direction from firms on how to measure performance of a construction project. The company's goals should be aligned with its projects as a critical part of the organization. If there is a weak alignment, then there will a waste of resources and effort even if completion is done within stipulated time. Regular and close interaction amongst the stakeholders of a project is important to completion of construction project. Projects require an enabling atmosphere and a strained one. Integrating technology into project management process could be one of the best ways that contribute to project completion. When team members see their test results and work progress immediately, they are more likely to be interested and motivated towards the outcome. Project managers need to be aware of their project technology preferences and provide the tools and equipment to the project team as they can be more motivated. Implementation of technological systems can either act as a medium for change or be the means of achieving a desired change in a project.

5.6 Suggestions for Further Studies

Further studies should be carried out on all Road construction firms to investigate the challenges they face in project planning and implementation. In the same breath a study should also be conducted in Nyamira County in the department of Roads and Transport to ascertain their capacity in construction. Another research in the area of governance structures on project implementation and project completion can be conducted. Further studies should also be undertaken on the factors affecting stakeholders involvement in project management.

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APPENDIX I: A letter of introduction

Harriet Bitutu Momanyi

P.O Box 2567300-00603

Nairobi

Email: harrietbitutu@gmail.com

Dear Sir/Madam,

My name is Harriet Bitutu Momanyi and I am a student undertaking a Master of Arts Degree in Project Planning and Management at the University of Nairobi. To fulfil the completion of this course, I am carrying out a study on the determinants of the completion of Road construction projects implementation in Nyamira County. I am requesting you to participate by filling and completing the attached questionnaire. Answer all questions as honestly as possible

Involving yourself is not coerced but your own wish and you may decline to participate at any time. In order to ensure that all the information will remain confidential, please do not include your name. All the information collected will on be used for academic purposes only.

Thank you.

Registration Number: L50/8437/2016

APPENDIX II: Questionnaire for Respondents

This questionnaire is to be completed by owner of the company or senior management. It seeks to establish the Determinants of Completion of Road construction projects: a Case of Nyamira County in Kenya. Kindly answer all questions as honestly and as fully as you can.

Section A: Background Information

Demographic:

Please choose the suitable answer and tick (✓) the option that is most appropriate to you

1. Gender

i) Male

ii) Female

2. Age

i) 20-29 yrs

ii) 30-39 yrs

iii) 40-49 yrs

iv) 50-59 yrs

v) 60 yrs &above

3. Highest Education Qualification

i) Diploma

ii) Degree

iii) Masters

iv) PHD

v) Others

4. Registration Category:

Kindly indicate (tick) the category for which the firm is registered

A

B

C

D

E

- F
- G
- H

5. Firms Experience:

For how long has the firm been in existence dealing with construction works? Please choose suitable answer here below and tick (√) where applicable.

- i) 1-2 1/2 yrs
- ii) 3-6 yrs
- iii) 7-9 yrs
- iv) 10-12 yrs
- v) 13-15 yrs
- vi) Over 16 yrs

6. Project Experience:

For how long has the firm been handling projects with the Ministry of Public Works? Please tick (√) the suitable answer here below

- i) 1-2 1/2 yrs
- ii) 3-6 yrs
- iii) 7-9 yrs
- iv) 10-12 yrs
- v) 13-15 yrs
- vi) Over 16 yrs

SECTION B: DETERMINANTS OF COMPLETION OF NYAMIRA PROJECTS

Schedule Tools Related Factors.

7. To what extent do schedule tools affect the completion of Road construction projects in Nyamira County?

- To a very great extent
- To a great extent
- To a moderate extent
- To a little extent

To no extent

8. To what extent do the following attributes of schedule tools influence the completion of Road construction projects in Nyamira County?

Use a scale of 1-5 where 1= very great extent, 2= great extent, 3= moderate extent, 4= little extent and 5 = not at all

Schedule Tools

Schedule tools factors	1	2	3	4	5
Period of Site Possession					
Project Commencement Date					
Completion Date					
Respondents' Opinion on time Allocated for Projects					
Contributors of Project Delays					
Effects of Project Delays					
Nature of client (Funding and organizational structure)					
Nature of client (Funding and organizational structure)					
Client's knowledge of construction project organization					
Owner's construction sophistication					
Design team experience					
Adequacy of plans and specifications					
Contractor experience					
Site management					

Funding Related Factors.

9. To what extent does funding influence the completion of Road construction projects in Nyamira County?

To a very great extent

To a great extent

To a moderate extent

To a little extent

To no extent

10. To what extent does funding attributes influence the completion of Road construction projects in Nyamira County. Use a scale of 1-5 where 1= very great extent, 2= great extent, 3= moderate extent, 4= little extent and 5 = not at all

Funding Related Factors	1	2	3	4	5
Project delivery system design-bid-build, design build)					
Project bidding method (price based competitive bidding, negotiated bidding, best value bidding)					
Project contract mechanism (lump sum, unit price, cost plus)					
Control mechanism					
Feedback capabilities					
Troubleshooting					
Quality assurance program					
Safety program					
Project delivery system design-bid-build, design build)					
Project bidding method (price based competitive bidding, negotiated bidding, best value bidding)					
Project contract mechanism (lump sum, unit price, cost plus)					
Control mechanism					
Feedback capabilities					

Management Related Factors

11. To what extent do management factors influence the completion of Road construction projects in Nyamira County?

- To a very great extent
- To a great extent
- To a moderate extent
- To a little extent
- To no extent

12. To what extent do the following attributes of management factors influence the completion of Road construction projects in Nyamira County.

Use a scale of 1-5 where 1= very great extent, 2= great extent, 3= moderate extent, 4= little extent and 5 = not at all

Management Related Factors.	1	2	3	4	5
Communication systems					
Upfront planning efforts					
Monitoring and updating plans					
Developing an appropriate structure					
Control of subcontractor work					
Implementing safety program					
Implementing QA programs					
Coordination effectiveness					
Decision making effectiveness					
Clear objectives and scope					
Holding of regular meetings					
Developing standard procedures/absence of bureaucracy					
Prior project management experience					
Risk identification and allocation					

Formal dispute resolution process					
Commitment to project					
Top management support					
Effective Strategic Planning					
Adequate funding throughout the Project					
Comprehensive Contract documentation					
Up to date technology utilization					

Environment Related Factors

13. To what extent does environment-related factors influence the completion of Road construction projects in Nyamira County?

To a very great extent

To a great extent

To a moderate extent

To a little extent

To no extent

14. To what extent do the following attributes of environment-related factors influence the completion of Road construction projects in Nyamira County. Use a scale of 1-5 where 1= very great extent, 2= great extent, 3= moderate extent, 4= little extent and 5 = not at all

Environment Related Factors	1	2	3	4	5
Community Response towards the project					
Community's faith and religion towards the project					
Effect of infrastructure on material delivery					
Material availability					
Commitment of all parties to the project					

Adequacy of funding					
Technology availability					
Human Skill availability					
X-Factor					
Economic environment					
Social environment					
Political environment					
Physical work environment					
Industrial relations environment					
Administrative approvals environment					

Project Completion

15. What has been the trend of the following aspects of Road construction projects completion rate for the last five years? Tick (√) where applicable

Completion Trend	Greatly Improved	Improved	Constant	Decreasing	Greatly decreased
Cost					
Time					
Quality					
Client Satisfaction					

16. Do you think that the presence of supervisors in the sites influence the rate of roads project completion?

Yes ()

No ()

Not sure ()

END

THANK YOU.


APPENDIX III: PERMIT LETTER

THIS IS TO CERTIFY THAT:
MR. HARRIET BITUTU MOMANYI
of UNIVERSITY OF NAIROBI,
25673000-603 NAIROBI, has been
permitted to conduct research in
Nyamira County

on the topic: DETERMINANTS OF THE
COMPLETION OF GOVERNMENT ROAD
CONSTRUCTION PROJECT IN KENYA:A
CASE OF NY6AMIRA COUNTY

for the period ending:
4th December,2018

Permit No : NACOSTI/P/17/85948/20284
Date Of Issue : 4th December,2017
Fee Received :Ksh 1000




[Handwritten Signature]
.....
Applicant's Signature


[Handwritten Signature]
.....
Director General
National Commission for Science,
Technology & Innovation

CONDITIONS

1. The License is valid for the proposed research, research site specified period.
2. Both the Licence and any rights thereunder are non-transferable.
3. Upon request of the Commission, the Licensee shall submit a progress report.
4. The Licensee shall report to the County Director of Education and County Governor in the area of research before commencement of the research.
5. Excavation, filming and collection of specimens are subject to further permissions from relevant Government agencies.
6. This Licence does not give authority to transfer research materials.
7. The Licensee shall submit two (2) hard copies and upload a soft copy of their final report.
8. The Commission reserves the right to modify the conditions of this Licence including its cancellation without prior notice.



REPUBLIC OF KENYA



National Commission for Science,
Technology and Innovation

RESEARCH CLEARANCE
PERMIT

Serial No.A 16747
CONDITIONS: see back page

APPENDIX IV: AUTHORIZATION LETTER



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: 020 400 7000,
0713 788787, 0735404245
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Email: dg@nacosti.go.ke
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When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref. No. **NACOSTI/P/17/85948/20284**

Date: **4th December, 2017**

Harriet Bitutu Momanyi
University of Nairobi
P.O. Box 30197-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *“Determinants of the completion of Government Road Construction Project in Kenya: A case of Nyamira County,”* I am pleased to inform you that you have been authorized to undertake research in **Nyamira County** for the period ending **4th December, 2018**.

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

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

G.P. Kalerwa

**GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO**

Copy to:

The County Commissioner
Nyamira County.

The County Director of Education
Nyamira County.

National Commission for Science, Technology and Innovation is ISO9001:2008 Certified