

**INVESTIGATING THE ADEQUACY OF CONSTRUCTION  
PLANNING IN KENYA**

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# **Investigating the Adequacy of Construction Planning in Kenya**

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## **DECLARATION**

This thesis is my original work and has not been presented for a degree in any other university.

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## **DEDICATION**

I dedicate this work to:

- My sisters Jane, Patricia, Roselyn, Jaki, Electina and Mercy
- My sons John Paul, Mark Michael, Luke Rafael and Matthew Larry
- My husband Diphaz
- My grandchildren Michael and Gabriel and all grandchildren to come.

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## **LIST OF ACRONYMS**

<b>ANOVA</b>	Analysis of Variance
<b>AMA</b>	American Management Association
<b>CI</b>	Construction Industry
<b>CIP</b>	Capital Improvement Plan
<b>CPM</b>	Critical Path Method
<b>CSP</b>	Critical Planning Processes
<b>GaWC</b>	Globalisation and World Cities Study Group and Network
<b>GDP</b>	Gross Domestic Product
<b>GNI</b>	Gross National Income
<b>GOK</b>	Government of Kenya
<b>ILO</b>	International Labour Organization
<b>JKUAT</b>	Jomo Kenyatta University of Agriculture and Technology
<b>NCA</b>	National Construction Authority
<b>NCC</b>	Nairobi City County
<b>NEMA</b>	National Environmental Management Authority
<b>NGOs</b>	Non-governmental organisations
<b>PM</b>	Project Management
<b>PMI</b>	Project Management Institute

<b>PPMS</b>	Project Performance Monitoring System
<b>ROK</b>	Republic of Kenya
<b>SSPS</b>	Statistical Package for the Social Science
<b>USA</b>	United States of America
<b>UON</b>	University of Nairobi
<b>WBS</b>	Work Breakdown Structure

## **ABSTRACT**

This study investigated the adequacy of construction planning in Kenya. The growth of a country's economy depends on the performance of major sectors that constitute it and in Kenya; infrastructure is one of the major sectors. Deficient planning techniques are commonly blamed for contractors' poor performance. The contractors' inadequacy emanates from: inexperience, incompetence, inappropriate planning techniques application, planning challenges, inadequate understanding of factors influencing construction planning and poor understanding of construction planning success indicators. The objectives of the study are to describe the level and adequacy of the planning activity, assess the factors that influence the adequacy of the planning activity and highlight the relationship between the activity and the factors. A survey research design using a questionnaire administered to 60 No. active contractors was adopted. The contractors selected by stratified random sampling, from NCA1, NCA2, NCA3, NCA4, NCA5 and NCA6. The study established thirty three (33No.) factors that influence construction planning. Data analysis techniques employed include descriptive statistics and analysis. Key players in construction planning were identified as the contractors. In addition the findings revealed that emphasis should be put on the sequencing of activities, work breakdown and activity durations. These findings indicate that planning methods are not adequately undertaken by the contractors in construction industry in Kenya. The study recommends that investigations on the construction planning methods should be undertaken to determine if they are adequate to be used by the contractors. Mitigation measures to address this were identified as reviews of construction planning processes and institutionalisation of these planning processes. It's recommended that contractor's should enhance their construction planning strategies and establish a good enabling environment for the execution of the construction planning activities.



# **CHAPTER ONE**

## **INTRODUCTION**

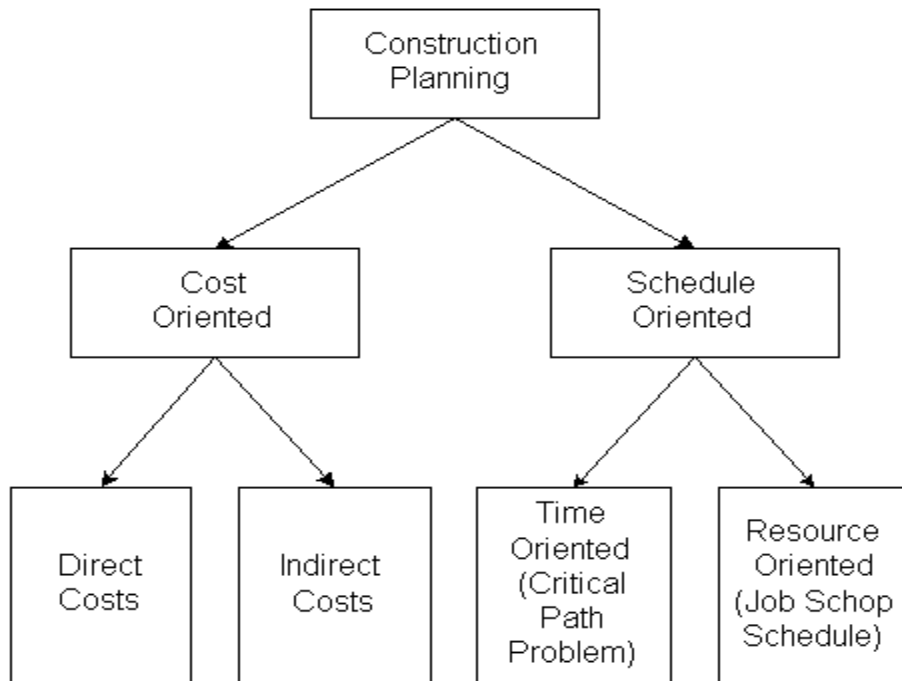
### **1.1 Background to the problem**

Construction is a strategic industry in developing economies like Kenya. In order for contractors to ably perform this role, there is a need to provide information on its various economic aspects including raw materials, products, processes, finance and labour. Construction statistics of Kenya have been evaluated in order to ascertain their adequacy in terms of scope, portrait, reliability and responsiveness in their coverage of the construction industry. Official statistics published in the annual Statistical Abstract were reviewed according to these adequacy criteria. The findings are that the scope of construction statistics is narrowly defined making the statistical portrait of the sector incomplete and that the statistics are also unreliable in terms of quality and unresponsive to economic challenges of inflation, structural adjustment policies and the decline of the public sector's role in the construction industry (K' Akumu, 2006).

Project execution is a process; it requires a script that describes in appropriate detail how the work involved is to be carried out. A good construction plan is the basis for developing the budget and the schedule for work. Developing the construction plan is a critical task in the management of construction, even if the plan is not written or otherwise formally recorded. In addition to these technical aspects of construction planning, it is also necessary to make organisational decisions about the relationships between all project participants. For example, the extent to which sub-contractors will be used on a project is often determined during construction planning.

In developing a construction plan, it is common to adopt a primary emphasis on either cost control or on schedule control as illustrated in Fig. 1 overleaf. Some projects are

primarily divided into expense categories with associated costs. In these cases, construction planning is cost or expense oriented. Within the categories of expenditure, a distinction is made between costs incurred directly in the performance of an activity and indirectly for the accomplishment of the project. For example, borrowing expenses for project financing and overhead items are commonly treated as indirect costs. For other projects, scheduling of work activities over time is critical and is emphasized in the planning process. In this case, the planner ensures that the proper precedence's among activities are maintained and that efficient scheduling of the available resources prevails. Finally, most complex projects require consideration of cost and scheduling over time, so that planning, monitoring and record keeping must consider both dimensions. In these cases, the integration of schedule and budget information is a major concern ("Project management methodology framework,"2015).



**Figure 1.1: Construction planning model** ( Source: PMBOK Guide, 2013 fifth edition)

This study investigated construction planning practices in Kenya. The construction industry is a complex entity involving large numbers of parties as owners (developers), contractors, consultants, other stakeholders such as the Government of Kenya (GOK) and Non-governmental organizations (NGOs), regulators such as National Construction Authority (NCA) and National Environmental Management Authority (NEMA).

## 1.2 Statement of the problem

Construction is a process with specific objectives which begins with an intention and ends with a product. This process as Chandra (2006) establishes, requires planning as this has the importance of organising work and allocating duties and responsibilities. However, construction planning has been done poorly by contractors in Kenya for a while as evidenced by time and cost over runs. In practise, contractors in Kenya do construction planning haphazardly (Researcher 2015). There are several tasks that can

be simultaneously carried out on a site. This requires proper planning of the tasks on the critical path. Some of the challenges faced by the contractors include lack of the knowledge and expertise in producing a construction plan.

Too little planning effort results in implementation failures, delays, and reworks. Construction projects are exposed to uncertain environment because of such factors as planning, design and construction complexity, presence of various interest groups (developer, consultants, contractors, suppliers, etc.), resources (manpower, materials, equipment), and funds availability, environmental factors, politics and statutory regulations. Construction planning is a comprehensive and systematic way of identifying, analysing and responding to risks to achieve the project objectives. It is therefore worth have a good construction plan which includes work break down structure and to use skilled workers.

Many researchers have attributed the underperformance of contractors to poor project planning due to: non-adoption of project management techniques; incompetence and inexperience; inefficient policies and practices; weak institutions and an adverse business environment; and complex social and cultural practices (Odediran, *et al.*, 2012; Aniekwu & Audu, 2010; Bala *et al.*, 2009; Muazu & Bustani, 2004; Achuenu *et al.*, 2000; Adams, 1997 as cited by Ibrahim, (2014).

Also underperformance of the contractors is perhaps due to inexperience, incompetence, inadequate understanding of factors that can significantly influence contractors project planning, none or inappropriate application of project planning techniques, none appreciation of contractors planning challenges and poor understanding of project planning success indicators that will ensure successful project delivery.

Successful completion of any construction along the critical dimensions of time, cost, quality, safety and value requires detailing of all the planning requirements. This could be achieved by describing construction planning methods in a process that takes into

consideration the adequacy of planning practices and the experts' views on improving the practices. The research study problem therefore is to investigate whether construction planning methods are adequately undertaken by contractors in Kenya.

### **1.3 Objectives**

The aim of this study is to investigate the adequacy of construction planning in Kenya, with a view to improving current planning approaches. The specific objectives are:

- 1.3.1 To describe the level of construction planning activity that is used.
- 1.3.2 To assess factors that influences the planning activity.
- 1.3.3 To outline ways of improving the construction planning process.

### **1.4 Research Hypotheses**

This study used nonparametric statistics to test the following null ( $H_0$ ) and alternative ( $H_1$ ) hypotheses:

**$H_0$ :** Planning methods are not undertaken by contractors in Kenya.

**$H_1$ :** Planning methods are undertaken by contractors in Kenya

### **1.5 Significance of the study**

This study will contribute valuable knowledge to contractors 'construction planning in developing countries, especially in Africa. The outcome of this research will be used to: enhance and facilitate contractors' efficiency in construction project delivery in Kenya; expose how contractors contribute to the failure or success of contractors' construction planning and; enrich literature within academia for the training of construction professionals, as well as eventually contribute to high performance in the construction industry. The significance of the study stems from the contribution that accrues from the construction industry to the economy.

An efficient construction sector, according to Oyewobi and Ogunsemi (2010), is a pre-requisite to effective national development. This is because, the products of the construction industry are desired mainly for the services which they help to create, as most business, social, religious, economic and, industrial activities operate on her structural base (Nwachukwu, 2008). However, all these benefits can only accrue from the industry to the economy when construction projects are efficiently delivered (Ibrahim, 2014).

This study's result and recommendations will contribute to the attainment of best practice globally. The study result will be disseminated through: conferences, workshops, journal publications, and academia-teaching. The research result will benefit: local and foreign contractors in Kenya, construction professionals, construction clients, and academic institutions.

## **1.6 Justification of the study**

In almost all countries, the construction sector is always used to invigorate national economies (Mogbo, 2001); because it contributes to the economy through the various resources, infrastructure and facilities it produces (Sheikh, *et al.*, 2010). The industry produces and maintains infrastructures and facilities required for various social, economic and industrial functions such as buildings, highways, dams, ports, industries and power stations (Alzahrani & Emsley, 2013; Achuenu, *et al.*, 2000). The infrastructural facilities produced by the industry are used for transportation, housing, communication, water and power supply, manufacturing and waste disposals, and the acquirement of these facilities enhances, supports, and defines the economic growth of a nation (Alzahrani & Emsley, 2013; Achuenu, *et al.*, 2000) as cited by (Ibrahim, 2014).

Construction projects can be unpredictable and delayed completion of a project has serious consequences including cost overruns and delayed use of the facility which may further result in the project not meeting the set objectives. Construction planning has been recognised by contractors as a very important process in order to achieve project objectives in terms of time, cost, quality, safety and environmental sustainability.

Construction planning is an iterative process: the process is beneficial when it is implemented in a systematic manner throughout the lifecycle of a construction project, from initiation stage to practical completion. When the client does not meet set objectives, realising the strategic plan may not be possible which can eventually affect the achievement of the developer's vision, mission and core mandate.

Data collected and conclusions shall enable construction administrators to clearly understand the relationship between construction planning and performance, and hence form a basis for improvement. It will also assist construction administrators to recognise the importance of establishing construction planning that enables workers to achieve construction industry goals. The recommendations will be valuable to the academicians and researchers in Kenya for academic purposes in learning on the significance of construction planning practices on construction projects performance.

### **1.7 Shortcomings and limitations of the study**

No proposed research project is without limitations. As Patton, (1990) notes, there are no perfect research designs. The study focused on data about construction planning sourced from multiple successful and unsuccessful construction sites of the economy. This was to establish the common and differentiating factors that lay behind successful construction planning by contractors.

The respondents in the study were contractors who are key stakeholders in the construction sector. In examining key issues on development of construction projects, the researcher sought to benchmark with how the well planned construction projects are managed in other countries and cities world over. The accessible data on the projects were very limited. NCA has categorised contractors as class NCA 1 up to class NCA 8. The study was limited to projects by NCA registered contractors only; sixty projects, both successful and unsuccessful were discussed for comparative purposes only.

## **1.8 Scope**

This study investigates construction planning practices in Kenya. It was conducted in Nairobi County where a study of 60 construction projects that were both on going and completed was carried out. The projects studied were both government funded projects and those undertaken by private developers.

Nairobi was selected because it is the most populous city in East Africa, with a current estimated population of about 3 million. According to the 2009 Census, in the administrative area of Nairobi, 2,143,254 inhabitants lived within 696 km<sup>2</sup> (269 sq. miles). Nairobi is currently the 13th largest city in Africa, based on population and fourth largest in infrastructure development and its size. The City is now one of the most prominent cities in Africa politically and economically. Nairobi also has the highest and largest commercial activities in the Kenya and is established as a hub for business and culture. The Globalisation and World Cities Study Group and Network (GaWC) defines Nairobi as a prominent socio-economic centre.

## **1.9 Theoretical framework**

This study is modelled on the theory of project management. Construction, according to Ireland (2006), may have been the seed for developing project management. Artefacts dating back nearly 5000 years reveal the application of project management in the delivering of great construction works of history (Chitkara, 2012; Ireland, 2006; Roberts & Wallace, 2004): Pyramids, Great Wall of China, and Roman roads and aqueducts. Project management as a discipline according to Chitkara (2012), originated with the development of CPM/PERT planning techniques in the early sixties, when the volume and complexity of tasks increased, especially in construction, aerospace and defence projects (Ibrahim, 2014).

Kerzner (2000) affirmed that the understanding of project management begins with the recognition of what a project is. A project according to Kerzner (2000) is an endeavour that has a definable objective, consumes resources, and operates under time, cost, and quality constraints. A project he affirms comes with a challenge in managing activities that have



never been attempted in the past and may never be repeated in the future. With the understanding of project in mind, Kerzner (2000) defined project management as the planning, scheduling, and controlling of a series of integrated tasks such that the objectives of a project are achieved successfully and in the best interest of the project stakeholders. John and Herman (2008) cited in Abdulrazaq and Ahmad (2011) described project management as a composition of organisation, structure, information processing, practice and procedure that permit integration of all project element-tasks, resources, information, stakeholders, etc. (Ibrahim, 2014). Gupta (2010), and Weiss and Wysocki (1992), reported that the development of project management theory bears its origin from the principles of general management. Though in prior literature, according to Koskela and Howell (2002a), it has been acknowledged that there is no explicit theory of project management. However, Koskela and Howell (2002a) argued that it is possible to precisely point out the underlying theoretical foundation of project management as advocated in the Project Management Body of Knowledge (PMBOK) by the Project Management Institute (PMI) and that is mostly applied in practice. This foundation according to Koskela and Howell (2002a) can be divided into a theory of project and a theory of management (Table 1.1 below).

**Table 1.1: Theoretical foundation of project management**

Subject theory	Relevant Theory Transformation
1. Project	Flow
2. Management	Value generation
Planning	Management as planning
Execution	Classical communication theory
Control	Language/action perspective
	Thermostat model
	Scientific experimentation model

Source: Koskela and Howell (2002b) as cited by Ibrahim (2014)

### 1.10 Definition of Operational Terms

In this study,

Activities are the tasks a contractor is expected to accomplish in his contractual obligation in any type of construction

Adequacy is the state of being sufficient for the purpose concerned. The determination as to whether the scope and concept of a planned operation are sufficient to accomplish the task assigned.

**Construction planning** is a fundamental and challenging activity in the management and execution of construction projects. It involves the choice of technology, the definition of work tasks, the estimation of the required resources and durations for individual tasks, and the identification of any interactions among the different work tasks.

**Contractor:** A corporate body that runs a contracting business that entails the provision of materials or a service to clients for a fee.

**Method statement** involves establishing a method statement for each activity that allows a detailed look at the project's resource requirements, which are not obvious at the strategic level.

**Planning** is an institutionalised activity comprising of a series of predetermined and coordinated actions and processes for carrying out operations for the identification, preparation, appraisal and implementation of projects Nyandemo and Kongere, (2010).

**Programme of works** primarily presents the sequence in which the various activities should occur with their associated durations and resource requirements.

**Respondents:** This comprised of NICs, consultants and PBPs; they are the elements that make up the study population, and provide answers to the study enquiry.

### **1.11 Organisation of the study**

The study comprises of five chapters. Chapter one includes introduction, gives the background of the study, defines the problem of the study, addresses and states the aims and objectives of the study. The study justification, significance and scope are also articulated in this chapter.

Chapter two contains the literature review. It includes review of the selected precedents including construction industry in Kenya, complexity of the construction industry, an outline of the construction industry, critical success processes during construction planning ending with the conclusion to the literature, the identified research gap and the conceptual frame work.

Chapter three covers the methodology of the study including the research strategy, research design, target population, sampling and sampling techniques, sources of data, type of data and methods of data collection, analysis and presentation. A statement on validation, reliability and variables of the study are also indicated in this chapter.

Chapter four covers the data collection, organisation, response, data analysis, discussion on the findings and presentation of the results obtained from the study.

Chapter five gives the study findings, a summary of the findings provides a conclusion and recommendations to the study.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter covers literature review and includes works and results from other researchers who have carried out their research in the same field of study. The specific areas covered in this chapter are; construction industry in Kenya, complexity of the construction industry, an outline of construction planning, critical success processes during construction planning, conceptual framework and the research gap the study seeks to fill.

#### **2.2 The Construction Industry**

The construction industry is considered one of the oldest industries organised on a project basis (Gollenbeck, 2008). Well known examples are the Egyptian pyramids (3rd millennium B.C.) and the aqueducts carrying water to cities and industrial sites that were constructed in Rome in 312 B.C. (Gollenbeck, 2008). One thing that is common to all these historic structures is the use of both human and material resources which are planned, organised, coordinated and controlled for the sole aim of realising the projects. It also involves a complex structure of different trades and professionals working in harmony towards the realisation of the projects.

The construction industry is of strategic importance to any nation due to the role it plays in the economy (Gollenbeck, 2009; Jinadu, 2007). It is responsible for the provision of infrastructure and contributes to a country's gross domestic product (Dada, 2012). The industry worldwide accounts for a sizeable proportion of a nation's economic activities and globally accounts for about 10% of the world economy (Adindu, 2012; Freeman, 2011). Approximately 70% of construction investment is accounted for in the United State of

America (USA), Western Europe, and Japan. The continent of Africa accounts for about 1%. Per capita investment in construction in the developed world is approximately \$2 500 per annum as against \$46 per annum in Africa (Freeman, 2011).

The low level of construction investment in Africa and lack of human capital potential has created a huge infrastructural deficit and this accounts for the low socio economic growth of the continent. The industry can be used for the socio economic development of developing economies (Hamilton, 2006). This is because of its unique ability to facilitate development of a nation by providing directly for human needs, stimulating investment, and generating employment (Hamilton, 2006). Hence, the construction industry is a sector that can assist the African continent to develop its economy as well as provide employment opportunity to its teeming population (Ibrahim, 2014).

### **2.3 Construction industry in Kenya**

Kenya is a developing country. As stated previously, the construction industry of Kenya provides the physical infrastructure necessary for the country's economy, in way of buildings and civil engineering structures of various standards, as recorded in the World Fact Book (CIA 2015). Regulatory bodies have been developed worldwide including USA, the American Management Association (AMA) and the PMI and are in place. There is also an American National Standard ANS/PMI 99-001-2008 which has published a guide to the PMBOK Guide, fifth edition. In Kenya we have the NCA which is mandated to regulate the construction industry and build capacity. The industry plays a major role in the development and achievement of society's goals such as economic growth, creation of employment and poverty reduction globally. It is one of the main economic engine sectors supporting many national economies (Shaban, 2008). Additionally the industry is a dynamic entity due to the level of uncertainties involved in technologies, budgets and development processes (Chan & Chan, 2004). Construction accounts for between 6% and 9% of the Gross Domestic Product (GDP) in many countries of the world (Chitkara 2010). The sector recorded an accelerated growth of

13.1% of the GDP in 2014. (Kenya National Bureau of Statistics, 2015). From this growth, the construction industry contributed to the GDP of the nation as follows: 3.8% in 2008, 4.1% in 2009, 4.3% in 2010, 4.1% in 2011 & 4.1% in 2012 (Kenya Institute for Public Policy research and Analysis, 2013).

Several developing countries at various levels of socio-economic development including Kenya have recognised the need and importance of taking measures to improve the performance of their construction industry (Gyadu-Asiedu, 2009) so the governments are taking up measures to train local contractors and transfer technology by partnering with other developed countries. An example is the large number of Chinese construction companies now spreading out worldwide.

One of the means to this end has been to ensure efficiency in project execution through construction planning. This has been done by development of various tools for construction planning using both the computer and manually. Examples of these tools are the task matrix, network diagram, line-of-balance scheduling, Gantt chart, Critical Path Method (CPM) and the Capital Improvement Plan (CIP) which are now widely used by contractors for planning.

Research on the planning in the construction industry of Kenya as a whole has been less than research on the industry's sub-entities – such as the projects, the contractors and the labour force. Consequently, in refereed fora, literature on construction planning activity in Kenya is rather limited. All the same, much may be gleaned from anecdotal evidence – such as the local technical magazines and daily newspapers.

#### **2.4 Kenyan construction problems blamed on corruption**

(NCA, 2014). NCA has also undertaken over 2000 sting operations where construction sites were suspended until compliance with the requirements of NCA Act and Regulation 2014 (NCA, 2016). However, buildings are going up so fast across Kenya such that national regulators can hardly keep up. When they find illegal activity, they

order construction stopped and sometimes tear down the building. In Kitengela, outside Nairobi the workers lack proper clothing and protective helmet. The environment is very unsafe and very unhealthy. “Many times regulators are often paid to look the other way. The whole process of construction planning requires clarity and specific intentions. NCA officers are now routinely out in the field to do a spot check on buildings where they look at signage, registration of project, whether the construction company and skilled workers undertaking the project are registered by NCA. The NCA has also embarked on training of contractors, skilled workers and site supervisors (NCA, 2016). The NCA says it has shut down more than 500 sites nationwide since August 2014, sometimes for safety violations, sometimes because of substandard building materials way. The big issue, the big elephant in the room, is corruption. Even when regulators are there, they are able to allow a whole lot of substandard practices, a whole lot of illegal practices, because of course they're able to extort bribes and are not serious about doing their work (Makokha, 2013).

In undertaking projects, there are possibilities that a project is not completed within the planned time. When constructions delay, development is affected in many aspects including retarding the process of development and denying the developer the use of the facility. It is therefore recommended that more priority be given to project time control than it is presently done (Talukhaba, 1988). This can be easily addressed by comprehensively addressing project planning issues.

## **2.5 Construction planning practices in Kenya**

The Kenyan construction industry continues to occupy an important position in the nation's economy (Kenya Vision 2030). The construction industry is important for the growth of an economy because the infrastructure development opens up areas. Construction planning therefore is a necessary and challenging activity in the implementation and management of construction projects. It involves making decisions on technology, identifying tasks and assessing required resources for specific tasks and



the interactions of the tasks. Developers and consultants, more often than not, fail to appreciate the full importance of the planned schedule. In the traditional approach to the project implementation, there are no strict requirements for scheduling important things like the level of detail required, the method to be used and the frequency of schedule updates. Most contractors in Kenya view the requirement for schedule as an unnecessary expense and waste of time and fail to invest sufficient resources in preparing the schedule also known as the work plan (NCA, 2015).

Other than the technical aspects, Chandra (2008) agrees with the position that construction plans should include identification of project stakeholders and their roles and interrelationships in the construction project. Planning is the tying up of activities towards achieving an objective with a timeline, scope and set resources.

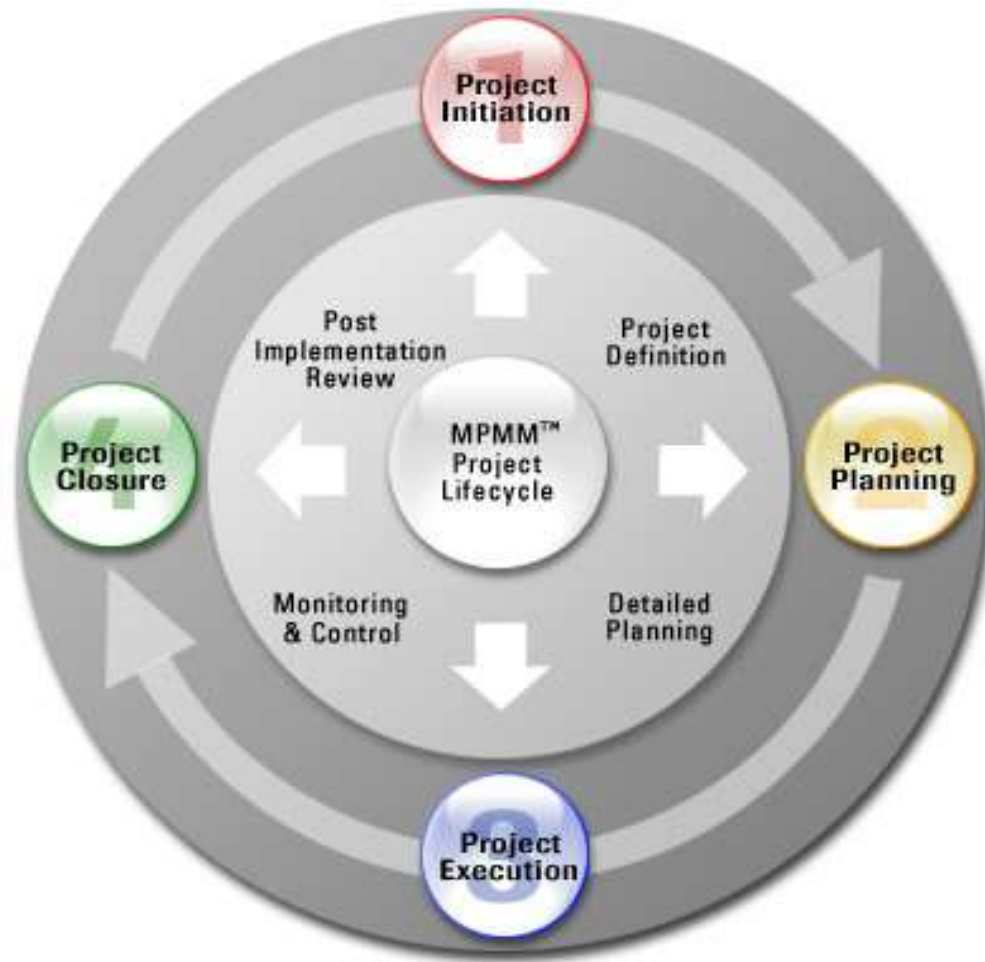
## **2.6 Construction project planning**

Project planning in construction industry is considered as one of the most important factors affecting performance of works (Cheung et al 2004). The whole process requires clarity and specific intentions. Investigations into Project Management (PM) practices adopted by Singaporean construction firms have seen construction planning practices that lead to better performance; and recommended key project planning practices that have been adopted by foreign construction firms in China to improve project performance (Ling *et al* 2007). A proper plan should be available where there is an intention to perform a task with specific objectives. Any process with specific objectives requires planning and this therefore is also true for construction processes. The most significant tasks in construction planning are: planning, estimating, scheduling, and executing this plan. These activities are continuous and iterative throughout the duration of the project and should not be seen as too rigid or only a pre-phase to production. Successful planning considers: the high level of uncertainty among project phases, changes in customer demands, setting up project deliverables in relation with project complexity and customer's needs (Perminova *et al.*, 2008).

## **2.7 Complexity of the Construction Industry**

The construction industry is a complex socio-economic organisation; it has a great diversity of role players, processes and outputs.

A project life cycle has four stages as shown in the figure 2.1 below. Construction planning is a paramount preoccupation of contractors and the process is rapidly increasing in difficulty with a continuous loss in confidence by clients. Today, one of the difficult issues facing practitioners in planning is that of a continuous increase in the complexity of construction projects. There seems to be no available tool or technique for assessing project complexity; consequently practitioners tend to neglect or subjectively assume its effect on project managerial objectives (Gidado, 2010).



**Figure 2.1: The four phases of a Project Lifecycle** (Source: PMBOK Guide, fifth edition 2013)

## 2.8 Project Initiation

This is the first phase in the project. A business opportunity is identified and a business case which provides various solution options is defined. A feasibility study is then conducted to investigate the likelihood of each solution option addressing the business problem and a final recommended solution is put forward. Once the recommended solution is approved, a project is initiated to deliver the approved solution. A 'Project Charter' is completed, which outlines the objectives, scope and structure of the new

project, and a Project Manager is appointed. The Project Manager begins recruiting a project team and establishes a Project Office environment. Approval is then sought to move into the detailed planning phase. A realistic time for execution of a project will reduce the possibility of disputes (Al-Momani, 2000). Projects strongly contribute to value creation in companies and societies, since a significant part of the global gross domestic product is initiated by projects (Turner *et al*, 2010). The project initiation process is considered as most relevant for integrating sustainability principles as in this early phase the most influence can be taken (Gareis *et al*, 2012).

## **2.9 Project Planning**

Once the scope of the project has been defined in the project charter, the project enters the detailed planning phase. This involves the creation of a:

- i. Project Plan (outlining the activities, tasks, dependencies and timeframes)
- ii. Resource Plan (listing the labour, equipment and materials required)
- iii. Financial Plan (identifying the labour, equipment and materials costs)
- iv. Quality Plan (providing quality targets, assurance and control measures)
- v. Risk Plan (highlighting potential risks and actions taken to mitigate them)
- vi. Acceptance Plan (listing the criteria to be met to gain customer acceptance)
- vii. Communications Plan (listing the information needed to inform stakeholders)
- viii. Procurement Plan (identifying products to be sourced from external suppliers).

At this point the project has been planned in detail and is ready to be executed. The need for effective short-term planning is great, since numerous factors exist which can be identified only after construction begins. These uncertainties mean that detailed work

plans for individual crews can be completed only near the start of a specific job, and can cover only a limited period of time (Laufer *et al*, 2006).

### **2.10 Project Execution**

This phase involves the execution of each activity and task listed in the project plan. While the activities and tasks are being executed, a series of management processes are undertaken to monitor and control the deliverables being output by the project. This includes the identification of changes, risks and issues, the review of deliverable quality and the measurement of each deliverable being produced against the acceptance criteria. Once all of the deliverables have been produced and the customer has accepted the final solution, the project is ready for closure. The successful planning and execution of large projects relies on the flexibility of engineering-construction-procurement firms. It is argued that the effective management of this flexibility depends on the acquisition and development of a set of core competencies (Lampel, 2001).

### **2.11 Project Closure**

Project Closure involves releasing the final deliverables to the customer, handing over project documentation, terminating supplier contracts, releasing project resources and communicating the closure of the project to all stakeholders. The last remaining step is to undertake a Post Implementation Review to quantify the overall success of the project and list any lessons learnt for future projects. The Project Closure Report should list all the activities required to close the project, to ensure that project closure is undertaken smoothly and efficiently. Once the report has been created and approved, the closure activities specified within the report are undertaken and the project is then officially closed. One to three months after the project has been closed and the business has begun to experience the benefits provided by the project, it is important to undertake an Evaluation, often referred to as a Post Implementation Review. This allows the business to identify the level of success of the project and list any lessons learned for future projects (“Project management: Project justification and planning”, 2016).

## **2.12 An outline of construction planning**

Construction planning is a method of determining “What” is going to be done, “How” things are going to be done, “Who” will be doing activities and “How much” activities will cost. In this sense planning does not cover scheduling, which addresses the “When”, but once planning is complete scheduling can be done. The planning phase of a project has three objectives: to assemble a detailed model of the work required, to produce the deliverables identified in the statement of scope, to reconfirm the earlier in-principle funding decision and to establish the environment in which the project will be executed. At this stage, the benefits and costs of the project are clearly documented, the objectives and scope are defined, the project team is appointed and a formal project office environment established. Detailed planning to ensure that the activities performed in the execution phase of the construction are properly sequenced, resourced, executed and controlled is now under taken. Planning occupies a central position in the functions of the Project Manager (Steiner 1979).

## **2.13 The Need for Planning**

Because construction execution is a very large process, it requires a “script” that describes, in appropriate detail, how the work involved is to be carried out. A planning phase is introduced into the overall structure of a project to prepare such a script. Construction planning involves considerable analytical effort. It also demands significant resources and appreciable elapsed time. If the quality of construction planning was unrelated to eventual levels of success then, clearly, planning would be a waste of time and resources. However, a very strong case can be brought forward in support of the claim that the quality of construction planning is a significant determinant of eventual success Pinto and Slevin, 1989; Zwikael and Globerson, 2004. As a result, “Failing to plan is planning to fail” has become something of a mantra among project management practitioners. Not surprisingly, planning features prominently amongst the key factors of project success (Dvir & Lechler, 2004; Johnson *et al.*, 2001; Pinto &

Slevin, 1989). As Dvir *et al* (2003,) put it: *“In fact, although planning does not guarantee project success, lack of planning will probably guarantee failure”*.

The first step is to document the project plan. A Work Breakdown Structure (WBS) is identified, which includes a hierarchical set of phases, activities and tasks to be undertaken on the project. After the WBS has been agreed, an assessment of the effort required to undertake the activities and tasks is made. The activities and tasks are sequenced, resources are allocated and a detailed project schedule is formed. This project schedule will become the primary tool for the project manager to assess the progress of the project. The input resources of material, labour, plant, finance, information and institutional resources result in outputs of various built products.

#### **2.14 Resource Plan**

After the project plan is formed, it is necessary to allocate the resources required to undertake each of the activities and tasks within the project plan. Although general groups of resources may have already been allocated to the project plan, a detailed resource assessment is required to identify the:

- i. Types of resources (labour, equipment and materials)
- ii. Total quantities of each resource type
- iii. Roles, responsibilities and skill-sets of all human resource, items, purposes and specifications of all equipment resource
- iv. Items and quantities of material resource.

A schedule is assembled for each type of resource so that the Project Manager can assess the resource allocation at each stage in the project. Current construction projects are complex and a lot of efforts and support of the design and construction profession is required (Ogunsemi & Jagboro 2006). This is also reflected by the contractor’s ability to

organise and control his site operations, to optimally allocate resources and to manage the flow of information to and from the design team and among contractors (Xiao & Proverbs, 2002).

### **2.15 Financial Plan**

A financial plan is prepared to identify the quantity of money required for each stage in the project. The total cost of labour, equipment and materials is quantified and an expense schedule is defined which provides the project manager with an understanding of the forecast spending vs. the actual spending throughout the project. Preparing a detailed financial plan is extremely important as the project's success will depend on whether or not it is delivered within the 'time, cost and quality' estimates for this project. Construction projects can suffer from preventable financial problems. Underbids ask for too little money to complete the project. Cash flow problems exist when the present amount of funding cannot cover the current costs for labour and materials, and because they are a matter of having sufficient funds at a specific time, can arise even when the overall total is enough.

Fraud is a problem in many fields, but is notoriously prevalent in the construction field. Global construction industry faces growing threat of economic crime (Retrieved from pwc. pwc. 2015, 16 September). Financial planning for the project is intended to ensure that a solid plan, with adequate safeguards and contingency plans, is in place before the project is started, and is required to ensure that the plan is properly executed over the life of the project. In many English-speaking countries, but not the United States, projects typically use quantity surveyors.

### **2.16 Quality Plan**

Meeting the quality expectations of the customer is critical to the success of the project. To ensure that the quality expectations are clearly defined and can reasonably be



achieved, a quality plan is documented. Quality can be defined as meeting the legal, aesthetic and functional requirements of a project (Arditi & Gunaydin, 1997).

The following define what quality means in terms of a project.

- i. Lists clear and unambiguous quality targets for each deliverable. Each quality target provides a set of criteria and standards which must be achieved to meet the expectations of the customer (PMBOK Guide, fifth edition 2013).
- ii. Outlines a plan of activities which will assure the customer that the quality targets will be met (i.e. a Quality Assurance Plan) (PMBOK Guide, fifth edition 2013).
- iii. Identifies the techniques used to control the actual level of quality of each deliverable as it is built (i.e. a Quality Control Plan) (PMBOK Guide, fifth edition 2013).

It is important to review the quality not only of the deliverables produced by the project but also of the management processes which produce them. A summary of each of the management processes undertaken during the execution phase is identified, including Time, Cost, Quality, Change (variation), Risk, Issue, Procurement, Acceptance and Communications Management. To address quality problems and their associated costs, the construction industry must pursue and implement innovative quality-management organizations and techniques (Burati *et al*, 1991).

### **2.17 Risk planning**

The construction industry traditionally deals with generic risks that are readily identified and mitigated (bad weather and rejected permits are typical examples), hence mitigation planning is important. The foreseeable project risks are then documented within a Risk Plan and a set of actions to be taken formulated to both prevent each risk from occurring and reduce the impact of the risk should it eventuate.

Developing a clear Risk Plan is an important activity within the planning phase as it is necessary to mitigate all critical project risks prior to entering the Execution phase of the project. During the project, risk monitoring and control is the processes of keeping track of the identified risks, monitoring the residual risks and identifying new risks. This process should also ensure the execution of the risk plan and continually evaluate the plan's effectiveness in reducing risk (Macmillan, 2014).

### **2.18 Acceptance Plan**

The key to a successful project is gaining acceptance from the customer that each deliverable produced meets or exceeds their requirements. To clarify the criteria used to judge each deliverable for customer acceptance, an Acceptance Plan is produced. The Acceptance Plan provides the criteria for obtaining customer acceptance, a schedule of acceptance reviews within which customer acceptance will be sought and a summary of the process used to gain acceptance of each deliverable from the customer (PMBOK Guide, 5<sup>th</sup> ed, 2013).

### **2.19 Communications Plan**

Prior to the Execution phase, it is also necessary to identify how each of the stakeholders will be kept informed of the progress of the project. The Communications Plan identifies the types of information to be distributed, the methods of distributing information to stakeholders, the frequency of distribution and responsibilities of each person in the project team for distributing information regularly to stakeholders (PMBOK Guide, 5<sup>th</sup> ed, 2013).

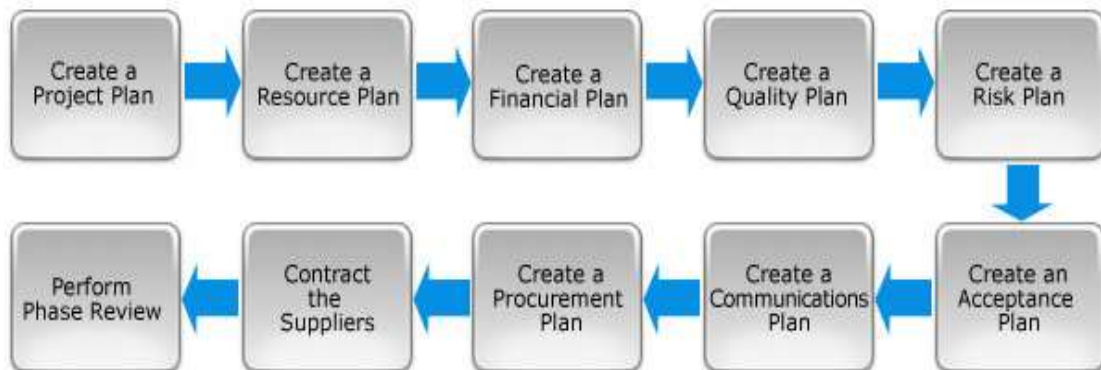
### **2.20 Procurement Plan**

Procurement is defined by Lyson and Farington (2006) as a process of obtaining goods and services. The Planning phase is used to identify the elements of the project which will be acquired from external suppliers to the project. The Procurement Plan provides a detailed description of the Products i.e. goods and services to be procured from

suppliers, the justification for procuring each product and the schedule for procurement. It also references the process for the selection of a preferred supplier (“Tender Process”) and the process for the actual order and delivery of the procured products (“Procurement Process”). Laufer and Tucker (1987) indicate that often formal planning seems to give more emphasis on scheduling and less emphasis on resource allocation and cash flow. The importance of how to carry out the works does not receive adequate attention. Steiner (1979) and Hussey (1982) cited by Laufer and Tucker (1987) states that “planning without a plan is a waste of time”. This author points out that method planning is given less emphasis than time and cost since this later two are more tangible, demonstrable and economically measurable. Laufer (1985) in Laufer and Tucker (1987) brings out the fact that most construction management programmes have more emphasis on production management than construction process. Further, Laufer and Tucker (1987) guide that to address issues of constructability; contractors may be brought in during the early stages of planning.

### **2.21 Perform Phase Review**

At the end of the Planning phase, a Phase review is performed. This is basically a checkpoint to ensure that the project has achieved its stated objectives as planned. The major indication of a contractor’s performance is the client’s satisfaction (Poon 2003). Poor contractor performance as characterised by poor work quality and low productivity is common in the industry. Furthermore, other problems associated with poor performance are cost over-runs, late completion, unacceptably high accident rate, insensitivity to environment consideration, poor work practices and adversarial relationships (Allens, 1994; Henry, 1994; Lobelo, 1996).



**Figure 2.2: Planning process model (Source: PMBOK Guide, fifth edition 2013)**

Since the model is an adoption from Ganesan 1984 – i.e. from studies done elsewhere - it is a fair representation of the detail complexity of many construction industries and can be emulated widely.

### **2.22 Critical Success Processes during Project Planning**

Critical Planning Processes (CSP), are those processes that contribute significantly to project success. From previous research, sixteen planning processes were ranked (identified in the PMI’s PMBOK guide, 5th edition 2013), according to their contribution to project success. Table 2.1 overleaf shows the results of this work, together with the PMBOK’s knowledge area to which each process belongs.

The four most important of these (according to their impact on project success) merit some comment.

1. Staff acquisition. It is generally accepted that the quality of human resources is an important factor in the quality of the work they perform. Specifically, in the project context, it is important that staff members have the relevant knowledge of, experience with, and interest in the specific project to which they are assigned (PMBOK Guide, fifth edition 2013).

2. Project plan development. This process involves the assembly of an overall plan for the project, which is based on the integration of several planning processes related to duration, time, cost, risk and others (PMBOK Guide, fifth edition 2013).

3. Cost estimation. Reliable estimates of outlays and internal human resources allow for achievable budgets which then have a lower likelihood of being exceeded. Although accuracy in estimates for critical project variables is desired and sought during planning, various factors will limit the reliability of these parameters. It is essential that each estimate produced at this time is qualified with a clear statement about its reliability, especially if there is a high level of uncertainty surrounding the figure provided (PMBOK Guide, fifth edition 2013).

4. Activity definition. Proper identification of a project's activities is one of the most critical planning processes to be performed by the project manager. This finding makes intuitive sense, since if an activity is left out during the planning phase, its late inclusion afterwards may have a strong negative impact on various aspects of the plan, especially the schedule and budget (PMBOK Guide, fifth edition 2013).

**Table 2.1: Ranked planning processes**

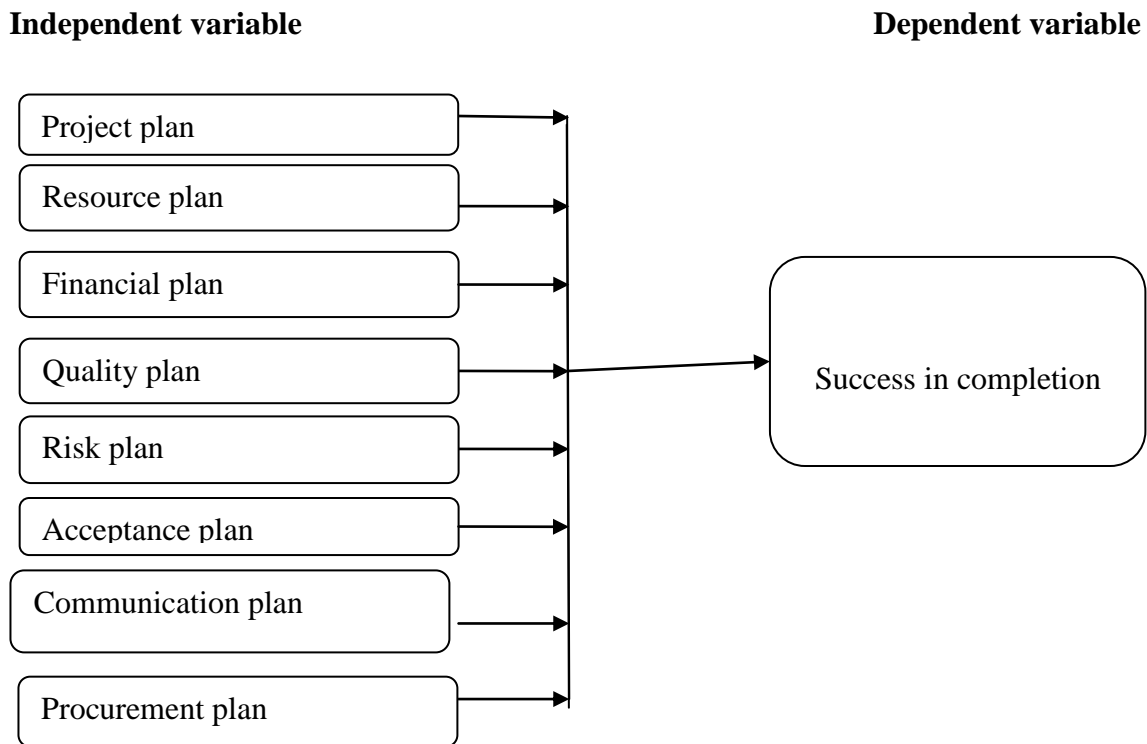
Ranking	Planning process	PMBOK's knowledge area
1.	Staff acquisition	Human resource
2.	Project plan development	Integration
3.	Cost estimating	Cost
4.	Activity definition	Scope
5.	Risk management planning	Risk
6.	Quality planning	Quality
7.	Resource planning	Human resource
8.	Procurement planning	Procurement
9.	Schedule development	Scheduling
10.	Communications planning	Communications
11.	Activity duration estimating	Scheduling
12.	Scope definition	Scope
13.	Cost budgeting	Cost
14.	Activity sequencing	Scheduling
15.	Scope planning	Scope
16.	Organisational planning	Human resource

Source: PMBOK Guide, fifth edition 2013

### **2.23 Conceptual Framework**

Adequate planning comprises of development of a schedule of activities, Resource plan, Financial plan, Quality plan, Risk plan, Acceptance plan, Communication plan and a Procurement plan. If a contractor has implemented all these efficiently, they are good and this guarantees success.

Conceptual framework is defined as the result of conceptualisation of the relationship between variables in the study and shows the relationship graphically or diagrammatically (Mugenda & Mugenda, 2003). It allows the quantitative conceptualisation; operationlisation, data collection and measurement of the variables identified. Based on the discussion of the various variables, the study will be guided by the following conceptual framework



**Figure 2.3: Conceptual framework (Source: Researcher 2015)**

### **2.24 Contractors' Project Planning Success Indicators**

According to Bennett (2003), to achieve success in construction planning there must be: a clear understanding of the project's objectives, purposes, scope and nature by both the client/owner and the organisation responsible for carrying out the work and a relationship between the client/developer; establishment of the project delivery team,

with clearly defined roles and responsibilities. Without this, the client or the consultant will negatively affect the contractor's construction planning. This therefore requires a good working relationship and sound communication network between the client/developer and the project delivery team. The issue of attaining planning success in developed countries is no longer a problem as they have embraced project management methodology, and consequently reaps its benefits (Ekundayo, *et al.*, 2013; Harris & McCaffer, 2005; Kerzner, 2000) as cited by Ibrahim (2014).

In developing countries like Nigeria however, contractors' construction planning is very poor due to non-adoption of project management techniques, management incapacity and the inability to plan projects adequately according to contractual requirements (Oladimeji & Ojo, 2012; Aniekwu & Audu, 2010; Idrus & Sodangi, 2010; Muazu & Bustani, 2004; Achuenu, *et al.* 2000; Saleh, 2004). This problem can be addressed if contractors understand the indicators of planning success and apply the knowledge of this understanding to planning their projects (Muazu & Bustani, 2004; Saleh, 2004; Achuenu, *et al.* 2000; Scott, 1995) as cited by Ibrahim 2014.

According to Oxford Dictionary of English (2000), success is the accomplishment of an aim or purpose, while an indicator is a thing that indicates the state or level of something. Therefore, success indicators can be construed as signals or signs that inform that an event, operation or activity has accomplished its intended purpose. A success indicator confirms a state of prosperity in an operation, or the attainment of success in an endeavour. In this context, any factor that signifies the attainment of the benefits of contractors' construction works operational planning, the curbing of wastage, and curtailing risks and accidents, constitutes an operational planning success indicator.

Thus, success indicators in consideration of the aforementioned requirements includes: plan's adherence to time, cost estimate, and to quality, adequacy of plan in determining suppliers' delivery dates, plan's capability to accommodate contractors' work, plan's



provision of basis for preparing schedules and, plan's efficiency in integrating the sub-contractors' work.

Furthermore, the breakdown of activities in a contractors' operational plan according to Scott (1995), must be such that all operations that might be affected by work changes and delays should be identified individually and as such, contractors' agent should have a good working knowledge of the project operational plan. Trade foremen need to be able to read the project schedules, tasks involved and specification, according to Passenheim (2009), to assist them in knowing what to do next. To achieve this, the contractors' project operational plan should be comprehensible. Hence, as a success indicator, the plan should be clear in communication and also comprehensible among trade heads.

A good contractor's operational plan according to Scott (1995) should be able to meet his job technical requirements including: appropriate time for striking formwork, ensuring correct sequences, having proper allowance for weather susceptible operations, etc. Hence, a contractor's project operational plan should be realistic and should properly predict what may happen to the project (Chitkara, 2012; Gupta, 2010; Scott, 1995; Seeley, 1986). Construction planning success indicators construed from the above mentioned factors include: plan's adherence to project technical requirements, plan's efficiency in identifying accident-prone areas and, plan's ability to curb re-work.

## **2.25 Discussion**

In conclusion, some research work has previously been done in developing planning practices in Kenya. It has also shown that construction planning models have been used for understanding construction activity. In the literature reviewed, no records of prior research work – on construction planning activity in Kenya – were found. The predominant methods used were the work schedules.

The processes of construction demands accuracy and very high precision. The capacity of prediction of estimated period of a building construction project indicates level of accuracy. The prediction of project completion time is a means of realising client satisfaction and will result in competitive advantage, all other things being constant. However, both external and internal forces influence the delivery time of projects. The ability to comprehend these influences on project delivery from inception to practical completion is dependent on experience and the level of training obtained by the planner, best summarised as construction planning practices. The inability of the client and his representatives in the project team to have a comprehensive overview of the construction process from inception to practical completion of the project, and environmental effects on the process, are very likely reasons for the non-realisation of projected delivery dates (Sambasivan & Soon, 2007). Lack of project planning competence could adversely affect delivery time of a project as well as its performance (Dainty, Cheng & Moore, 2003). Project planning is a tool for project success (Cooke-Davies 2001). The site-based nature of projects characterised by complexity, uncertainty, poor communication in the form of timing, extent, and content, inadequate coordination of organisations and activities, and inadequate integration of tasks, organisations, and personnel, provide an ideal climate for the empowerment of individuals and teams (Tuuli, Rowlinson & Koh 2010). Therefore, the project planning practice is directly proportional to the level of success a project may attain.

## **CHAPTER THREE**

### **RESEARCH DESIGN AND METHODOLOGY**

#### **3.1 Introduction**

In this chapter the methodology and general procedures used in this study are explained. This includes: research strategy, research design, and which basically covers schemes, outlines or plans that are used to generate answers to research problems. It includes a description of the research methodology adapted, description of area of survey, population sample and sampling, data collection, variables and finally concludes with conceptual definitions and measure of the variables.

#### **3.2 Research strategy**

A preliminary research approach comprising of a qualitative method of data production used a thorough literature review and semi-structure pilot interviews of a convenience sample comprising: 10 contractors. The interviews aimed at acquiring more information concerning contractors' construction planning with emphasis on local contractor use and method of applying projects planning tools, projects planning challenges, projects planning influencing factors, and projects planning success indicators. Information from the literature review and the outcomes of the interviews were used as a basis for developing the research questionnaires. Afterward, questionnaires were pre-tested before being used to obtain quantitative data from respondents.

#### **3.3 Research design**

The objective of this research was to investigate the adequacy of contractors planning usage in the different types of construction systems. Considering the aforementioned demands of the research objectives, the research approached its design in three stages: conducted an initial inquiry to gain insights and ideas about the research problems and

the variables and issues associated with the problems through an extensive literature search and a pilot interview (explorative design) (McNabb, 2009); afterwards carefully mapped out a circumstance, situation, or set of events to describe what is happening or what has happened, mainly through the benefits of questionnaire techniques (descriptive method) (McNabb, 2009); Rosenthal and Rosnow, 1991 cited in McNabb, 2009; Buys, 2004) and; finally, followed up questionnaire (contractors) responses by searching written records and accounts of past happenings and events in contractors business dealings (contract execution), using historical data (documentation) (Buys, 2004).

The research design adopted fall under the two broad classification of research design (McNabb, 2009): quantitative design (exploratory and descriptive); and qualitative design (explanatory). In this light therefore, the research uses both qualitative and quantitative research design respectively.

The multiple cases were both successful and unsuccessful. This compares with what Maina (2012) refers to as valid and verifiable.

### **3.4 Population, sample and sampling**

#### **3.4.1 Target population**

The target population for the research was building contractors who are registered by NCA class 1-6. As at December 31<sup>st</sup> 2015, NCA registered contractors in class NCA 1 were 113 no., NCA 2 were 95 no., NCA 3 were 132 no., NCA 4 were 448 no., NCA 5 were 566 no. and NCA 6 were 1,080 no. this made a total of 2,434 no. as the population of the study. According to Adams (1997), the best way to obtain information free of bias and with increased accuracy concerning contractors is from contractors themselves. The researcher saw it prudent to target building contractors in class NCA 1 to NCA 6 because they carry out works worth minimum Kshs. 20 million and have at least one graduate director. This enhances chances of having the requisite knowledge of construction planning (Nkirote, 2015).

### **3.4.2 Sample and sampling Techniques**

A total of 60 questionnaires were distributed. The study adopted the structured questionnaires for sampling.

The sampling technique employed was stratified random sampling. A method of sampling that involves the division of a population into smaller groups known as strata. The strata comprised of 10 no. contractors' from each class in the population. In stratified random sampling, the strata are formed based on members' shared attributes or characteristics. A random sample from each stratum is taken in a number proportional to the stratum's size when compared to the population. These subsets of the strata are then pooled to form a random sample. The main advantage with stratified sampling is how it captures key population characteristics in the sample. Similar to a weighted average, this method of sampling produces characteristics in the sample that are proportional to the overall population. Stratified sampling works well for populations with a variety of attributes, but is otherwise ineffective, as subgroups cannot be formed (Mugenda & Mugenda 2003).

Building contractors in Nairobi registered by NCA class NCA1 to NCA6 were selected by stratified random sampling to form a sampling frame of 60 contractors. Cases were considered up to NCA 6 because it was deemed that these contractors had enough experience to respond to the research.

## **3.5 Data collection process**

### **3.5.1 Sources of data**

Combined methods comprising a variety of data collection methods were employed. These methods were necessary as they enabled cross checking of data, continuously analysing data and identify recurring issues.

The methods used in the data collection process included: (i) a pre coded check list/ guidelines; (ii) writing material: sketch pads; (iii) data storage devices; flash disks; (iv) lap top, scanner, printer, photocopy, computer software. Descriptive Statistics (Frequency Distribution & Cross Tabulation), multiple linear regression analysis on SPSS 20.0, MS Excel for data maintenances and archival information. Data was sourced from contractors and further from text books and the internet.

### **3.5.2 Types of data to collect**

The research data were collected through primary and secondary sources. Primary data were collected through interviews and the use of questionnaires while secondary data were collected through a critical review of literature from the following sources: Conferences, Workshops and Journal papers, Newspapers, Forms of contract, Text books, Theses, and the internet.

### **3.5.3 Methods of data collection**

Data collection was through exploratory desk studies and structured interviews. Structured interviews entail administering interview schedules with a set of questions to all respondents with a view of aggregating the replies thus the choice. Semi structured interviews was an appropriate method as there was a clear focus on the research topic (Bryman, 2012). A template of an introductory letter to the respondent's Appendix 1 was prepared for the purposes of making contact with the respondents from the sampled projects.

The researcher made telephone calls to all the respondents and sought appointments with a view to having face to face interviews with them. Face to face interview with the respondents was preferred since it necessitates probing of the respondent to obtain exhaustive information (Bryman, 2012). The interview period spread over twenty two working days. On average three interviews were undertaken per day with the interviews taking an average of one hour in the offices of the respondents. These interviews were

undertaken with the researcher taking hand written notes on prepared templates (Appendix 2) and writing the notes was necessitated by the sensitivity of the respondents regarding recording. Semi structured interviews were designed in order to get views on aspects of construction planning identified from literature reviews. Studies of the randomly sampled projects was also under taken to validate the results of the interviews, a process supported by Bryman (2012) who qualifies that interviewing may be the sole method in an investigation or maybe used in tandem with qualitative method.

#### **3.5.4 Data analysis and presentation**

Data was continuously analysed during the study using Descriptive Statistics (Frequency Distribution & Cross Tabulation), multiple linear regression analysis on SPSS 20.0, MS Excel for data maintenance and Archival Information. It involved editing, coding, analysing and final interpretation of this data. This ensured that the necessary data was tied up and any arising issue was dealt with promptly and some of the data flowed through.

Therefore our model will be expressed as follows:

$$SC = 1.952 + 0.236PP + 0.175RP + 0.676FP - 0.004QP - 0.504RIP + 0.131AP - 0.624CP + 0.437PRP$$

Where:

SC = Success in Completion; PP = Project plan; RP = Resource Plan; FP = Financial Plan; QP = Quality Plan; RIP = Risk Plan; AP = Acceptance Plan; CP = Communication Plan; PRP = Procurement plan

The final data was then presented in narratives, tables, figures, and pie charts.

### **3.5.5 Data validity and reliability**

This study conducted validity and reliability test on the data obtained in the questionnaire and on the questionnaire construct respectively.

#### **Validity Test**

This research satisfies both the content and construct validity test. The content validity test refers to the adequacy with which a measure or scale has sampled from the intended universe or domain of content. This research used purposive sampling technique to sample from the intended universe. The adequacy of the sampling emanates from the facts that the research is directed towards a defined group of respondents who are best able to respond to the research issues (Maina, 2012; Ibrahim, 2011; Mugenda & Mugenda, 2003). The construct validity test is concerned with a variable measurement instrument measuring particularly that which it is intended to measure. This condition was also attained by this study questionnaire; the questionnaires were able to measure all it intended to measure. Consequently, this enabled the study to test all its hypotheses and answer its objectives.

The validity of the data collected from the field was concerned with checking the respondents' account with what actually exists. To ensure this validity in the survey, the study sought to measure only what was necessary and every effort was made to minimise random error with the use of a structured interview schedule appendix 7. Right application of tools of data collection reduced the interfering variables.



### **Reliability test**

The reliability of the data collected was concerned with consistency that is the probability of obtaining the same if the study was conducted again. This enhanced the reliability of the results of the subjective judgements.

This study used the internal consistency test to test its questionnaire reliability. According to Field (2006) Cronbach's alpha ( $\alpha$ ) is used to measure questionnaire reliability index. Technically, Cronbach's  $\alpha$  is not a statistical test (Ibrahim, 2011); it is a coefficient of reliability (or consistency). It measures the consistency of a questionnaire's construct (items) and indicates how a scale is free from random error (Ibrahim, 2011; Pallant, 2001). This study therefore used Cronbach's alpha ( $\alpha$ ) to tests its questionnaire construct consistency and level of random error.

The use of Cronbach's  $\alpha$ , allows negative construct to be detected and positive to be accepted ranging from a scale of 0 to 1.0 (Ogwueleka, 2011). The minimum acceptable value for Cronbach's alpha is from 0.5 to 0.6 (Ogwueleka, 2011; Olatunji, 2010). The cut-off value for this study therefore is 0.70; in essence, for items to be used together as a scale in this study, the items must be above the cut-off value. Table 3.1 shows the Cronbach's  $\alpha$  values interpretation within a scale of 0-1.

**Table 3.1: Cronbach's  $\alpha$  values interpretation**

<b>Reliability values</b>	<b>Reliability status</b>
< 0.5	Poor
0.5-0.7	Sufficient
> 0.7	Good

Source: Olatunji (2010)

Using the Cronbach's  $\alpha$  scale as a measure, this study measured questionnaires construct consistency (reliability) and level of random error. The questionnaires were constructed basically to capture two broad constructs (demographic profiles and study objectives).

### **3.6 Variables**

#### **3.6.1 Dependent and independent variables**

The variables to the study are project plan, resource plan, financial plan, quality plan, risk plan, acceptance plan, communication plan, procurement plan and success in completion. The dependent variable is success in completion with the others being independent variables.

#### **3.7 Ethical considerations**

For the current study, the participants were informed through an introductory letter about the purpose of the study beforehand (Appendix 1). The major ethical issues that were addressed by the study included informed consent, privacy and confidentiality, as well as anonymity and researcher's responsibility as outlined by Ritchie and Lewis (2003).

Under informed consent, the respondents were provided with adequate information about the study. They were informed about the purpose of the study, the benefits of the study to them and the construction industry as a whole. This information was a basis for the selected participants to make an informed decision to participate in the study.

On privacy and confidentiality, the study respected the privacy of respondents and maintained as confidential all data collected. Some of the data collected was private and confidential as it related to the operations the organisation used in order to gain competitive edge. Thus all data collected and analysed was used for the purpose for which the current study was undertaken and was not divulged to unauthorised persons.

Therefore, the study refrained from collecting data that pertains to the identity of the participants. Where cases were discussed, real names of the participants were not used. For responsibility, the researcher collected and analysed data to fulfil the purpose of the study only.

## **CHAPTER FOUR**

### **RESULTS, DISCUSSIONS AND PRESENTATIONS**

#### **4.1 Introduction**

This chapter presents analyses and interpretation of data collected. The analysis used literature review and questionnaire survey. Literature review was used to identify construction planning challenges, significant influencing factors for construction planning and, contractors' construction planning success indicators. The questionnaire survey section covers information concerning: responses to questionnaires, demographic profiles of respondents', hypotheses testing, data presentation, analyses and interpretation.

#### **4.2 Statistic Method**

Methods that were used to investigate the adequacy of construction planning processes include Descriptive Statistics (Frequency Distribution & Cross Tabulation), multiple linear regression analysis on SPSS 20.0 and MS Excel for data maintenance.

#### **4.3 Data collection**

The data was gathered from questionnaires and literature review as the research instruments. The questionnaire was designed in line with the objectives of the study. To enhance quality of data obtained, Likert type questions were included whereby respondents indicated the extent to which the variables were practiced in a five point Likert scale. This scale is most appropriate and is commonly used for such study. The study sought to inquire information on various aspects of respondents in three areas: background information in response to the respondents, contractor's attitude towards construction planning and construction planning process.

#### 4.4 Description of the population

The study targeted a population of NCA registered contractors who are based in Nairobi County. The total number of the contractors in Nairobi registered by NCA as by 31<sup>st</sup> December 2015 was 2,434 no. Participants were from companies both constructing private property and those constructing in the public sector; 83.3 % of the respondents actively participated in the study while 16.7% were unable to make any contributions; 52.0% of the respondents were from the public projects sector while 48.0% were from the private projects sector; those with experience between 11-15 years recorded the highest number of participant with 32.0% of the respondents. Public sector project contractors recorded the highest number of those with more than 25 years of experience that is 4.0%. There were no participants with experience between 20-25 years as shown in Table 4.0 overleaf:

**Table 4.0 Contractors years of experience**

			Industry Sector		Total
			Private Sector	Public Sector	
Years of Experience	>5 yrs	Count	1	11	12
		% of Total	2.0%	22.0%	24.0%
	6-10 yrs	Count	4	3	7
		% of Total	8.0%	6.0%	14.0%
	11-15 yrs	Count	8	8	16
		% of Total	16.0%	16.0%	32.0%
	16-20 yrs	Count	11	2	13
		% of Total	22.0%	4.0%	26.0%
	> 25 yrs	Count	0	2	2
		% of Total	0.0%	4.0%	4.0%
	Total	Count	24	26	50
		% of Total	48.0%	52.0%	100.0%

Source: Researcher 2016

According to Mugenda and Mugenda (2003), a response rate of 50.0% is adequate for analysis and reporting for descriptive/survey studies; a rate of 60.0% is good and a response rate of 70.0% and over is excellent. Based on the assertion, the response rate at 83.3% was considered to be excellent. This commendable response rate was made a reality after the researcher made personal calls and visits to remind the respondents to fill-in and return the questionnaires.

#### **4.5 Contractors attitude towards construction planning**

Construction is a process with specific objectives which begins with an intention and ends with a product. These processes however have been done poorly by contractors. The researcher sought to find out the contractors' attitudes towards construction planning on a Likert scale of 1-5; where; 1=strongly disagree, 2=disagree, 3=Neutral, 4=Agree and 5= strongly agree.

**Table 4.1: Contractors attitude towards construction planning**

<b>Attitude</b>	<b>Count</b>	<b>Mean</b>	<b>Media n</b>	<b>Std. Deviation</b>	<b>Skewness</b>
Importance of planning	50	3.9	4.0	.678	-1.517
Past Experience	50	3.9	4.0	.614	.055
Information and Communication Channels	50	4.0	4.0	.781	-.873
Skilled Workers	50	4.0	4.0	.742	-.969
Cost, quality, delivery	50	3.9	4.0	.808	.024
Budget Allocations	50	3.7	4.0	.957	-.176
Lack of coordination	50	3.8	4.0	1.030	-.863
Time Consuming	50	3.7	4.0	.999	-.457
Planning Guarantee	50	3.4	3.5	1.030	-.537
Planning process	50	3.1	3.0	.839	-.842
Expertise	50	3.1	3.0	.978	-.533
Record keeping	50	3.1	3.0	.904	-.459

Source: Researcher 2016

Table 4.1 above shows the descriptive statistics of various respondents in various industry sectors in regards to various specified attitudes towards construction planning. On average majority of the respondents were neutral to their responses. A mean grade of between 3.1 - 3.9 was recorded by the majority of the respondents; Clear information and communications channels and skilled labour recorded the highest mean of 4.0.

The skewness of the data spread is between +/-1 which shows that the data is not normally distributed. The data is slightly skewed to the negative but most data is around +/- 1 because some contractors were not sure about the answers to give.

**Table 4.2: Contractors response towards importance of construction planning**

Contractor's Attitude	Importance (%)					Total %
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
Importance of planning	2		16	70	12	100
Past Experience			24	62	14	100
Information and Communication Channels	0	6	10	58	26	100
Skilled Workers		6	8	64	22	100
Cost, quality, delivery		2	34	40	24	100
Budget Allocations	2	4	42	28	24	100
Lack of coordination	4	6	22	42	26	100
Time Consuming	2	10	28	38	22	100
Planning Guarantee	6	10	34	38	12	100
Planning process	6	12	48	34		100
Expertise	10	10	48	28	4	100
Record keeping	6	12	48	30	4	100

Construction planning being a view of improving the current approaches to the construction, planning played a key role in most of the projects delivery with more than

70.0% of the respondents agreeing that it's a key tool for delivery of a project on schedule.

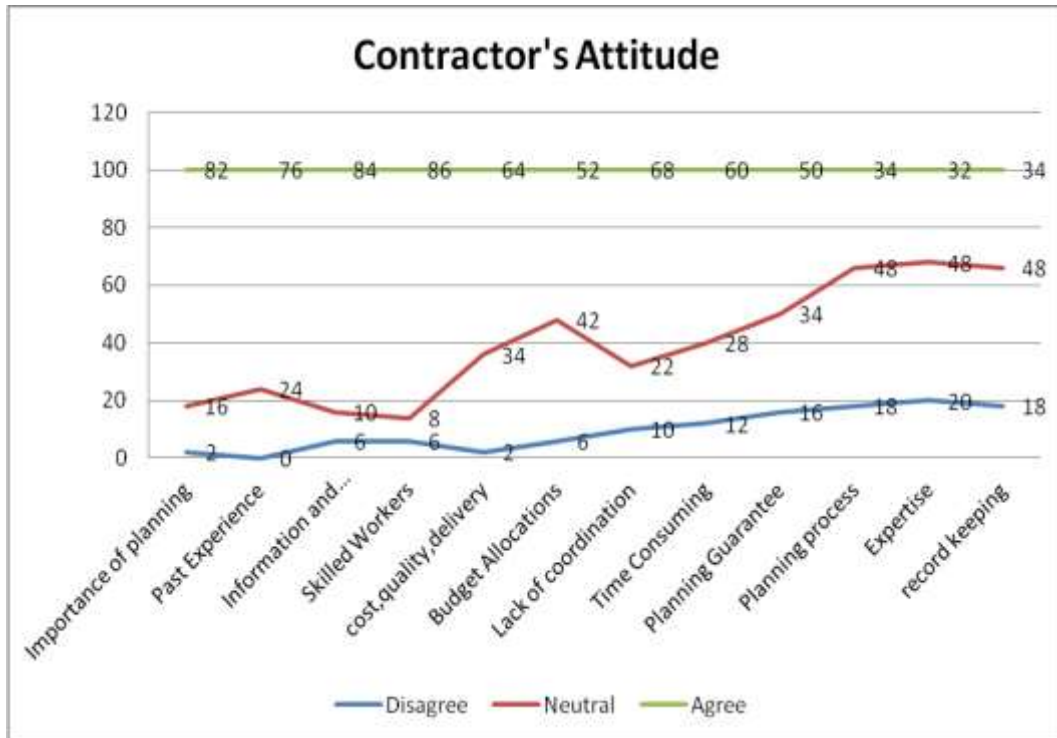
In order for the project to continue smoothly it is paramount that the contractors have requisite experience in construction. 62.0% agreed that experience was vital; only 24.0% of the respondents did not see past experience as an ingredient in ensuring that the project run smoothly.

Clear information with right channels of communications constitutes a major role in construction planning. The research revealed that it is indeed a virtue to be adopted by the contractors. 84.0% of the respondents supported that clear information and communication channels are necessary in the construction industry 6.0% of the respondents however gave a dissenting verdict while 10.0% of the respondents gave a neutral opinion.

From the research above as presented in figure 4.1 overleaf, 86.0% of the respondents were of the opinion that skilled workers play a significant role in ensuring that the project is delivered on time, 8.0% gave a neutral opinion while 6.0% saw no importance of skilled workers as far as project delivery is concerned.

In a construction project, focus should be on the budget allocations that is in terms of cost and time duration; Table 4.2 above shows that 52.0% of the respondents supported that poor estimates (budget allocation) affects constructions planning, 42.0% of the respondents were neutral while 6.0% gave a contrary opinion as shown in Figure 4.1 overleaf.





**Figure 4.1: Contractors response towards importance of construction planning (Source: Researcher, 2016)**

Also insufficient planning and lack of coordination of resources adversely affect construction planning; This was supported by 68.0% of the respondents 22.0% of the respondents were neutral while 10.0% disagreed as shown in Figure 4.1 above.

Record keeping, need of expertise and being unable to follow the planning processes recorded the least support from the respondents with 34.0%, 32.0% and 34.0% of the respondents agreeing with statements respectively.

#### **4.6 Construction Planning Processes**

##### **4.6.1 Construction Schedule (Work Plan)**

Construction schedule outlines activities to be carried out and the time frames for the project. The study sought to determine to what extent the various activities under

construction plan processes are carried out with 1 being the list extent and 5 being the greatest extent.

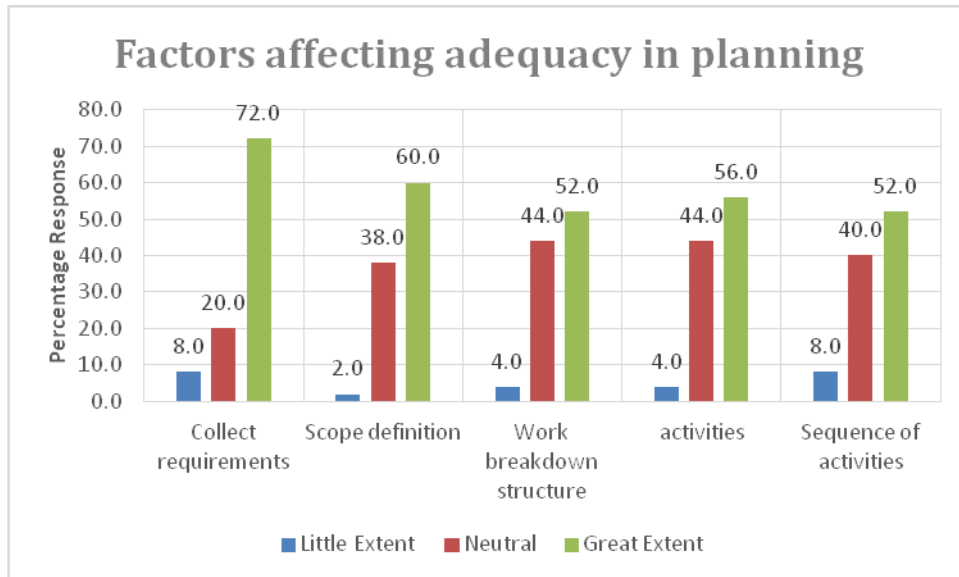
**Table 4.3: Construction Schedule**

**Descriptive Statistics**

		Collect requirements	Scope definition	Work breakdown structure	Activities	Sequence of activities
N	Valid	50	50	50	50	50
	Missing	0	0	0	0	0
Mean		3.6400	3.6000	3.4800	3.5600	3.4400
Median		4.0000	4.0000	4.0000	4.0000	4.0000
Std. Deviation		.80204	.67006	.67733	.64397	.73290
Skewness		-1.715	-1.018	-.951	-.232	-.918
Std. Error of Skewness		.337	.337	.337	.337	.337

Source: Researcher 2016

Table 4.3 above shows that on average, majority of the respondents were neutral to rank the factors that affect the adequacy of the planning process. This means that many contractors either do not understand planning or do not carry out the activities under study. The study revealed that the sample population that was selected did not represent a normal distribution since the skewness is slightly more than +/-1. Few values are slightly skewed to negative showing that some contractors do not know what they are saying.

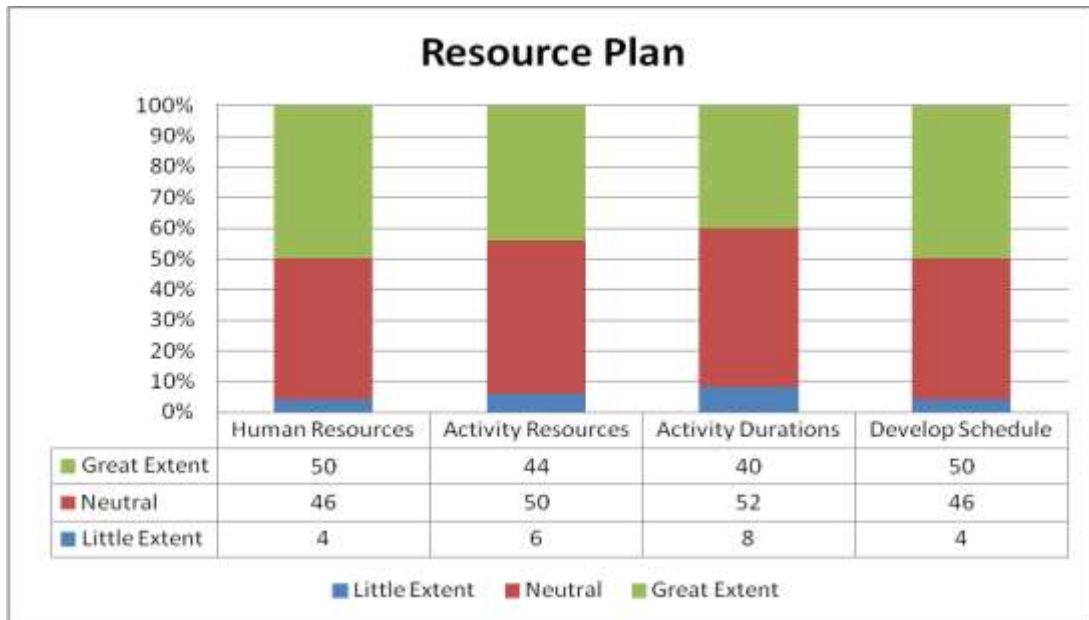


**Figure 4.2: Adequacy in planning by contractors (Source: Researcher, 2016)**

In the figure 4.2 above, the study revealed that 72.0% of the respondents considered collect requirements as one of the most critical factor that influences the adequacy of the planning activities, 60.0% said that scope definition was of great importance while 52.0% confirmed that breakdown structure and sequence of activities are of great support respectively in that order.

It is interesting to note that though most of the respondent commended majority of the factors, to a great extent, a huge population tended to be neutral as shown in the same figure 4.2 above; as high as 44.0% and a low of 20.0%. this means most of the contractors did not understand the study.

#### 4.6.2: Development of Resource Plan



**Figure 4.3: Resource Plan (Source: Researcher 2016)**

Human resources and development of Resource Plan recorded 50.0% of respondents confirming that they were critical factors in constructions planning process. It is evidently confirmed from the attitudes of the contractors that 86.0% of the respondents confirm that skilled labour helps delivery of projects in time. Majority of the respondents were either neutral or to some low extent supported the factors. Figure 4.3 above illustrates the extent to which respondents rated the factors under resource plan.

#### 4.6.3 Financial plan

In a construction project, focus should be on the budget allocations in terms of cost and time duration; Majority of the contractors confirmed that financial plan quantifies the financial expenditure to be incurred during construction project. 76.0% of the respondents to a great extent supported that cost estimates is vital while 60.0% said that

monthly budget as a factor contributes to a great extent in financial planning as shown in Table 4.4 below.

**Table 4.4: Financial plan**

<b>Extent of Financial plan</b>	<b>Low Extent (%)</b>	<b>Great Extent (%)</b>
Estimate Costs	24	76
Monthly Budget	40	60

Source: Researcher 2016

#### **4.6.4 Quality Plan**

Quality plan provides assurance and control measures in the projects under construction. 78.0% of the respondents said that targets constitute to great extent on quality of the construction projects. Quality control methods recorded 73.0% in support of quality assurances to the project. It's evident that quality plan contributes to a great extent in construction planning process when targets are set as in table 4.5 overleaf;

**Table 4.5: Quality plan**

<b>Quality plan/Extent</b>	<b>Low Extent (%)</b>	<b>Great Extent (%)</b>
Targets	22	78
Quality Control Methods	24	73

Source: Researcher 2016

#### **4.6.5 Risk plan**

Risk Plan highlights potential risks and actions taken to mitigate them. The research study found out that it's prudent to identify the risks of the project at hand and their

responses rather than doing the risk analysis. Results of the research are shown in Table 4.6 below;

**Table 4.6: Risk plan**

<b>Risk/Extent</b>	<b>Low Extent%</b>	<b>Great Extent%</b>
Risk Identification	32	68
Risk Analysis	58	42
Risk Responses	42	58

Source: Researcher 2016

#### **4.6.6 Other activities**

The results from Table 4.7 below suggests that majority of the respondents to a great extent recommended preparation of acceptance plan to be done, 62.0 % confirmed that phase review was of essence while only 48.0% supported the idea of outsourcing.

**Table 4.7: Other activities**

<b>Extent of Activity</b>	<b>Low %</b>	<b>Neutral %</b>	<b>Great %</b>
Acceptance plan	4	32	64
Communication listings	8	42	50
Procurement	10	36	54
Outsourcing	8.0	44.0	48.0
Phase review	4.0	34.0	62.0

Source: Researcher 2016

#### **4.7 Relationship between completion and planning process**

The aim of this study was to investigate the adequacy of construction planning in Kenya with a view to improving current planning approaches. This was to be achieved through

determination of level of adequacy on planning activities, assessing the factors that affect the adequacy and outlining the ways to improve the processes.

The research established the relationship between ways of improving planning adequacy and the planning processes as shown in the conceptual framework. The study obtained the following results as shown in the Table 4.8 overleaf.

**Table 4.8: Descriptive Statistics**

	Mean	Std. Deviation	N
Construction planning	3.9000	.67763	50
Collect Requirements	3.6400	.80204	50
Human Resources	3.4400	.64397	50
Estimate Costs	3.7400	.48697	50
Targets	3.8400	.50950	50
Risk Identification	3.7200	.72955	50
Acceptance plan	3.6000	.75593	50
Communication plan	3.4200	.73095	50
Procurement plan	3.4600	.70595	50

Source: Researcher 2016

The assumption that we considered in selecting specific factors was through ranking. Those individual factors that were rated highly were selected for modelling as shown below. All factors were averagely rated neutral by most of the individuals who participated in the study. The data factors that were being evaluated qualified as being critical in the project evaluation models for the construction industry. Shown in Table 4.9 as model summary below:

**Table 4.9: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.670 <sup>a</sup>	.449	.341	.54998

a. Predictors: (Constant), q10c, q9a, q5a, q6a, q10a, q7a, q8a, q10b

Source: Researcher 2016

The model summary in Table 4.9 above represents the correlation between the variables which is 0.670, indicating a high degree of correlation. In this case, 34.1% can be explained using the stated variables; Planning, Collecting requirements, Resource planning, Procurement, Communication, Risk, and Financial plan in the model while the 65.9% is the variance which can be attributed to some other variables not included in this study. Other studies should be carried out to bridge the gap of the unexplained difference.

**Table 4.10: ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.099	8	1.262	4.173	.001 <sup>b</sup>
	Residual	12.401	41	.302		
	Total	22.500	49			

a. Dependent Variable: q4a

b. Predictors: (Constant), q10c, q9a, q5a, q6a, q10a, q7a, q8a, q10b

Source: Researcher 2016

The ANOVA table above indicates the statistical significance of the regression model that was run. Here,  $p < 0.001$ , which is less than 0.05, and indicates that, overall, the regression model statistically significantly predicts the outcome variable (that is, it is a good fit for the data).



The Coefficients table 4.11 below provides us with the necessary information to predict success from project plan, as well as determine whether project plan contributes statistically significantly to the model. Financial, Risk, Communications and Procurement plans contribute significantly to the model since their *p-value* is less than 0.05; but that does not indicate that the other factors do not contribute to the development of the model.

**Table 4.11: Coefficients<sup>a</sup>**

Model	Unstandardised Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.952	.930		2.098	.042
Project	.236	.131	.280	1.802	.079
Resource	.175	.152	.166	1.151	.257
Financial	.676	.233	.486	2.901	.006
1 Quality	-.004	.250	-.003	-.017	.986
Risk	-.504	.173	-.543	-2.917	.006
Acceptance	.131	.158	.146	.829	.412
Communication	-.624	.195	-.673	-3.201	.003
Procurement	.437	.135	.455	3.235	.002

a. Dependent Variable: q4a

Source: Researcher 20160

It is evident that the null hypothesis was not supported. From other analysis, most contractors are neutral in their ranking. This means that the contractors do not know what they should be doing. The planning methods are not adequately undertaken by the contractors in construction industry in Kenya. The contractors should be encouraged by both the NCA and the consultants to practise construction planning.

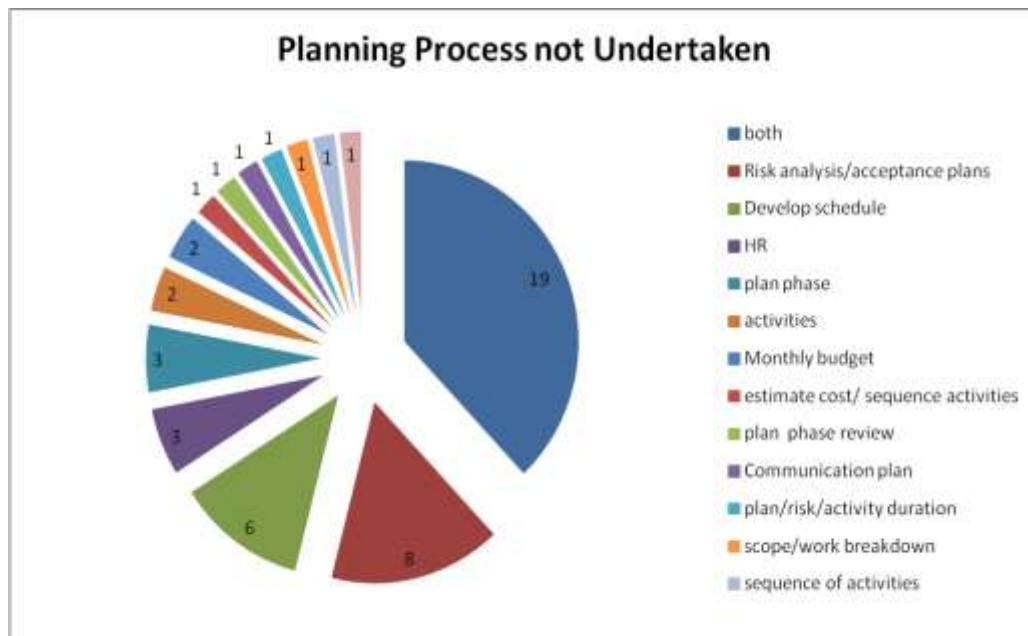
#### 4.8 Planning processes not undertaken

The results obtained from the field study on construction processes that are not undertaken as shown in figure 4.4 overleaf shows that majority of the respondents did not undertake all processes as stated in the construction action plan.

The findings as indicated show that risk analysis and acceptance plans are not practised well; schedule development also did not get a lot of support from the respondents.

Human resource was also not considered as important with most of the respondents.

Interestingly, the same image was reflected on the above developed model table 4.11. It is clearly shown that not all planning processes were significant to model development.



**Figure 4.4: Planning process not undertaken (Source: Researcher 2016)**

## **4.9 Conclusion**

I undertook this analysis to establish the adequacy of planning by contractors'. The respondents to the data collection were fifty (50No.). I carried out both descriptive and inferential statistics. The factors which are most important in planning are use of skilled workers and communication. From a methodological perspective, sample sizes are relatively small. Therefore, generalisability is a limitation.

The study, therefore, attempted to fill this gap in the literature. It examined how adequate construction planning affects the construction performance in Kenya at the micro level and was empirical in orientation.

From table 4.3, some of the coefficients are slightly skewed to the negative but most of them are +/- 1 meaning that some of the contractors are not sure about what they are saying in answering the questionnaire. In table 4.8, the standard deviations are different for the factors. This is an indication that the contractors do not have the right exposure to these factors.

## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter is concerned with the discussion of results. It entails interpreting findings in light of previous studies, as well as describing the implications of the findings.

This study broadly used quantitative research approach. The study employed the exploratory and descriptive survey methods through an extensive literature search and questionnaire survey methods respectively. This study results were presented using average mean scores, frequencies and percentages.

#### **5.2 Summary of the findings**

In the light of the study objectives and hypotheses, this study presents the following as its summary of findings:

The study targeted a population of 60 participants constructing both private and public facilities; 50 of the respondents actively participated in the study while 10 were unable to make any contributions; 26 of the respondents had worked in the public sector while 24 worked in the private sector (Table 4.0). Contractors who have worked on public facilities recorded the highest number of those with more than 25 years of experience that is 2. There were no contractors with experience between 20-25 years who had constructed private facilities.

On average majority of the respondents were neutral to various specified attitudes towards construction planning in their responses. Clear information and communications channels and skilled labour recorded a high mean of 4.0 each (figure 4.0).

Construction planning with a view of improving the current approaches to the construction, planning played a key role in most of the projects delivery with more than 35 of the respondents agreeing that it's a key tool for delivery of a project on schedule as shown in table 4.2.

The study also established that in order for the project to continue smoothly it's paramount that the contractors have requisite experience in construction and clear information with right channels of communications constitutes a major role in construction planning (figure 4.1).

From the study most of the respondents were of the opinion that skilled workers play a significant role in ensuring that the project is delivered on time. 8.0% gave a neutral opinion while 6.0% saw no importance of skilled workers as far as project delivery is concerned.

### **5.3 Conclusion**

This study used literature review, interviews and questionnaire survey methods, to attain its aim of investigating adequacy of construction planning, and to establish a strategy for NCAs construction planning in building projects. The study concludes that there is a lot that the construction industry itself can do to improve its adequacy in construction planning. The study supported the null hypothesis and rejected the alternative hypothesis. This implies that the research study was supported and the sample data used was efficient to make a conclusion on the entire population that investigations on the construction planning methods should be undertaken to determine if they are adequate to be used by contractors.

The findings of this study are a valuable resource and reference in academia in the teaching and understanding of the actual position of the application of project planning techniques, project planning challenges, project planning influencing factors, ICT application in project planning, and what constitutes contractors' project planning

success indicators. It will as well provide information on contractors' project planning attitude in developing countries.

#### **5.4 Recommendations**

This study has established that contractors' low level of involvement in the execution of construction planning is negatively affecting their competency and capability to adequately plan projects. Their underperformance in cost and time is argued to result from poor construction planning. It has also been argued that contractors have a good attitude towards construction planning and need to adopt it in their planning. Besides, the contractors do not experience severe challenges in the execution of their construction operational plans. Record keeping should also be encouraged as this will greatly assist in financial planning. From figure 4.1 above, 18% of the contractors disagree that record keeping is important. These challenges can be curbed by acquiring and adhering to factors that can influence their construction planning. This study also argued that the contractors understanding and adherence to contractors' construction planning success indicators will guide them in the planning and management of projects to ensure project success. Based on this study finding, the following recommendations are proffered:

**Table 5.1: Recommendations for improving construction planning practices**

<b>S/No.</b>	<b>FINDINGS</b>	<b>RECOMMENDATIONS</b>
1	Importance of planning	Need to put in place Strategic Management Structure that can improve construction planning.
2	Past experience of contractors	This is crucial for smooth running of a project. The contractors to be encouraged to bench mark projects for continual improvement.
3	Skilled workers	Adequate supervision should be undertaken during the Industry Based Learning so as to make the graduates of TVET have the required experience when they finally enter the job market. There should be scheduled visits by the training institutions to ensure that the trainees are exposed in their area of specialization.
4	Budget allocations	Focus should be on budget allocation. The developers to be enlightened on the need to honour payment certificates as soon as they are due.
5	Lack of coordination	Engaging employees and improving their attitudes towards job security and performance management
6	Expertise	Adequate supervision should be undertaken during the Industry Based Learning so as to make the graduates of TVET have the required experience when they finally enter the job market. There should be scheduled visits by the training institutions to ensure that the trainees are exposed in their area of specialization.
7	Record keeping	Focus should be on daily record keeping and account balancing.

Source: Researcher 2016

The recommendations are done in line with the study objectives. When the correct amount of planning effort is invested, the project implementation time is optimised, and there is a high probability that the project will achieve its intended objectives. A construction that is not planned well will suffer time and cost overruns and subsequently delay (Firdman, 1991).

### **5.5 Areas of further study**

This study recognised from its findings, areas of concern and importance to contractors construction planning that could not be studied appropriately in the course of this work, hence are worthy of further study.

The current research study was limited to investigating the adequacy of construction planning in Kenya with a view to improving current planning approaches and assessing the factors that influence the adequacy of the planning activity. The planning practices investigation was limited to the contractors in the building industry. The areas for further research could be focused on the various parties (consultants included) that are involved in the planning practice, quality control, monitoring of progress, costing and project control.



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## APPENDICIES

### Appendix 1: Questionnaire invitation letter

Ms. Inviolata Wacike Siboe

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Nairobi 00200

Email: [inviolatesiboe@yahoo.com](mailto:inviolatesiboe@yahoo.com)

12<sup>th</sup> January 2016.

Dear Respondent,

#### **Ref: Invitation to participate in a Research Project**

I am a Post Graduate student of Jomo Kenyatta University of Agriculture and Technology (JKUAT) under taking a master's degree in Construction Project Management in the school of Architecture and Building Sciences, department of Construction Management. In partial fulfilment of the requirements of the degree, I am carrying out a study entitled "Investigating the adequacy of Construction Planning in Kenya."

You are invited to participate in this research project. I am undertaking this research study under the supervision of Dr. Stephen Diang'a and Dr. Abednego Gwaya, both of Jomo Kenyatta University of Agriculture and Technology, School of Architecture and Building Sciences. The project has been approved by Board of Post Graduate Studies of JKUAT.

You have been selected to participate in this study as a stakeholder in one of the selected cases for the study. This study aims to investigate the adequacy of construction planning in Kenya. About twenty five respondents are expected to participate in the study.

If you agree to participate, you will be required to attend a 30-45 minute interview on the practices of construction planning. The interview will be conducted at your place of work or at a mutually convenient place of your choice. Your participation has got no risks attached but it will

be great contribution to advancement of knowledge in construction. Any information that you provide will be treated with utmost confidence.

A copy of the research project will be provided to you upon request. Your cooperation will be highly appreciated.

Yours faithfully,

**Inviolat Siboe**

## Appendix 2: Questionnaire

### Investigating the Adequacy of Construction Planning in Kenya

DEPARTMENT OF CONSTRUCTION MANAGEMENT  
SCHOOL OF ARCHITECTURE AND BUILDING SCIENCES (SABS)  
JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY  
NAIROBI-KENYA

#### Section A: Background Information

This section requires respondent to provide information about their experience IN working either for the private sector developers or the public sector developments. Kindly put a tick (✓) in the bracket next to the selected response.

1. Sector of industry

Private constructions sector [       ]       Public constructions sector [       ]

2. Years of experience as a contractor

Less than 5 years [       ]       6-10 years [       ]

11-15 years [       ]       16-20 years [       ]

21-25 years [       ]       more than 25 years [       ]

**Section B: Contractor's attitude towards construction planning.**

3. On a scale of 1-5, please rank to what extent you agree with the following statements on construction planning principles in your organisation where; 1=strongly disagree, 2=disagree, 3=Neutral, 4=Agree and 5= strongly agree

		1	2	3	4	5
a	Construction planning is a key tool for delivery of a project on schedule					
b	In order that work should proceed smoothly there should be emphasis on past experience for contractors					
c	Clear information and communication channels are necessary in the construction industry					
d	Skilled workers help to deliver projects on time					
e	In a construction project focus should be on cost, quality and delivery					
f	Construction planning is adversely affected by poor estimation of duration and cost					

g	Construction is adversely affected by insufficient planning and lack of coordination of resources					
h	Construction planning is very time consuming					
i	Construction planning does not guarantee construction success					
j	Construction planning is not adequately learned at any level					
k	Construction planning is a very complicated activity that needs experts					
l	Construction planning is about keeping a daily diary or record of everything					

**Section C: Construction planning processes.**

4. Please rank to what extent you developed a construction schedule outlining the activities, tasks, dependencies and timeframes in this project under the titles named below? 1=No extent, 2=little extent, 3=Neutral, 4=Moderate extent and 5= Great extent

		1	2	3	4	5
a	Collect Requirements					
b	Scope definition					

c	Work Breakdown Structure					
d	Activities					
e	Sequence of activities					

5. To what extent did you develop a resource plan listing the labour, equipment and materials required in this project under the titles named below? 1=No extent, 2=little extent, 3=Neutral, 4=Moderate extent and 5= Great extent

		1	2	3	4	5
a	Human Resource Plan					
b	Activity Resources					
c	Activity Durations					
d	Develop Schedule					

6. To what extent did you prepare a financial plan to quantify financial expenditure incurred for completion identifying the labour, equipment and materials costs in this project under the titles named below? 1=No extent, 2=little extent, 3=Neutral, 4=Moderate extent and 5= Great extent

		1	2	3	4	5
a	Estimate Costs					
b	Monthly Budget					

7. To what extent did you plan for quality providing targets, assurance and control measures in this project under the titles named below? 1=No extent, 2=little extent, 3=Neutral, 4=Moderate extent and 5= Great extent

		1	2	3	4	5
a	Targets					
b	Quality control methods					

8. To what extent did you plan for risk management highlighting potential risks and actions taken to mitigate them in this project under the titles named below? 1=No extent, 2=little extent, 3=Neutral, 4=Moderate extent and 5= Great extent

		1	2	3	4	5
a	Risk Identification					
b	Risk Analysis					
c	Risk Responses					

9. To what extent did you plan for the following other activities in this project? 1=No extent, 2=little extent, 3=Neutral, 4=Moderate extent and 5= Great extent

		1	2	3	4	5
a	Prepare Acceptance plan listing the criteria to be met to gain customer acceptance					
b	Plan Communications listing the information needed to inform stakeholders					
c	Plan Procurements					
d	Identify resources and timeframes for outsourcing to external suppliers					
e	Plan phase review					

**Section D: Planning processes not under taken**

10. Please explain which of the construction planning processes stated in section 3a to 9e before that you do not carry out or do not effect in your work?

**Thank you for cooperation and input.**



### **Appendix 3: LIST OF PUBLICATIONS**

#### **A. Journal publications**

1. Africa Habitat Review 9 (2015) 823-832, a Journal of School of the Built Environment, University of Nairobi.

#### **B. Conference proceedings**

1. Effects of planning on performance by local contractors in the Nairobi County, Kenya.

<http://elearning.jkuat.ac.ke/journals/ojs/index.php/jscp/article/view/file/1057/862>  
co-authored paper at the 8<sup>th</sup> JKUAT scientific conference November 2013.

2. Factors that influence health and safety of workers at construction sites in the Nairobi County, Kenya.

<http://elearning.jkuat.ac.ke/journals/ojs/index.php/jscp/article/view/download/1060/865>  
co-authored paper at the 8<sup>th</sup> JKUAT scientific conference November 2013.

3. An investigation of panel wall housing construction in Kenya

<http://elearning.jkuat.ac.ke/journals/ojs/index.php/jscp/article/view/file/1068/872>  
co-authored paper at the 8<sup>th</sup> JKUAT scientific conference November 2013.

#### **C. Others**

The following papers were accepted for presentation at the 9<sup>th</sup> JKUAT Scientific Conference on 13<sup>th</sup> November 2014:

1. An assessment of the impact of professional supervision on quality of workmanship in construction industry in Nairobi City County.
2. Assessment of factors affecting performance of employees in the informal construction sector in Kenya rural and peri urban (a case of Rongu Migori County).