PRECONSTRUCTION PLANNING: EXPLORING THE FACTORS THAT INFLUENCE TIMELINESS OF PROJECT COMPLETION FOR PUBLIC SECTOR BUILDINGS IN KENYA

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Preconstruction planning: Exploring the factors that influence timeliness of project completion for public sector buildings 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

This Research Thesis is dedicated to first and foremost the Lord God Almighty, who sustained me right through it all. This research is in addition dedicated to my two wonderful grandchildren Julianna and Michael, my children Gatimu, Siongo and Siae who stood with me and believed in me and my friend Njoroge who supported and encouraged me. Mum Sarah, Pastor Charles Ambaka and all the brethren in my Bible Study group who ceaselessly stood with me in prayer, this Research Thesis is dedicated to you as well.

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ABBREVIATIONS AND ACRONYMS

AWP	Annual Works Programme
BOOM	Building Organization and Operations Manual
BOQS	Bills of Quantities
CA	Chief Architect
CAQDAS	Computer Aided Qualitative Data Analysis
CDO	Contract Documentation Officer
CQS	Chief Quantity Surveyor
DT	Design Team
FPG	Forward Planning Group
FTA	Federal Transit Administration
GL	Group Leader
HOD	Head of Department
ISO	International Organization for Standardization
KERRA	Kenya Rural Roads Authority
KIA	Kenya Institute of Administration
KIBS	Kenya Institute of Business Studies
MDA	Ministry Department & Agency
MHE	Ministry of Higher Education
MMS	Ministry of Medical Services
MOBE	Ministry of Basic Education
MOHA	Ministry of Home Affairs
MOPH	Ministry of Public Health
MOPW	Ministry of Public Works

MOR &PW	Ministry of Roads and Public Works
MTC	Ministerial Tender Committee
NYS	National Youth Service
OP	Office of the President
PCP	Preconstruction planning
PLO	Project Liaison Officer
PM	Project Manager
PMC	Project Management Committee
PPOA	Public Procurement Oversight Authority
PS	Permanent Secretary
PSA	Principal Superintending Architect
PSS	Project Submission Sheet
SPSA	Senior Principal Superintending Architects
SSMB	Sports Stadia Management Board
TET	Tender Evaluation Team
TSC	Teachers Service Commission

ABSTRACT

The Building Industry in Kenya makes up a significant proportion of the National GDP and it is critical that project implementation takes this into cognizance. Many scholars have looked into the role of project planning and have come to the conclusion that this is an important component in successful project completion Hendrickson (2000), Chandra (2006) and Ramakrishna (2010). These studies seem to focus on distinct aspects of project control, project forecasting, scheduling and the technical aspect of project planning without exploring preconstruction planning (PCP) factors that strike a balance between the many planning aspects. The aim of this research is to explore the factors at preconstruction planning for public buildings in Kenya that influence timeliness of project completion and present them in a harmonized framework.

This research is a survey of knowledge and information through semi-structured interviews with Project liaison officers of Client Ministries and Project Managers in the Ministry of Public Works. The research adopts a qualitative strategy with a cross-section research design and an element of exploratory case studies on randomly sampled projects. Grounded theory which entails coding the collected data with concepts and further putting them into categories was applied in analyzing the data.

The study findings established that preconstruction planning factors include processes and the institutional structure within which the processes are executed. Procurement of the Contractor, Clients approval of preliminary designs/estimates and preparation of detailed designs are key during the preconstruction planning stage. Key players in the PCP stage were identified as the Permanent Secretary/Policy level in contract signing, design team

and the procurement committee. In addition, the findings revealed that project PCP is to a significant extent practiced for Public Sector projects and considerably affects timely delivery of projects. Inadequate personnel, long decision making processes and inadequate and late release of project funds were identified as key factors that cause project delay at the PCP stage. Mitigation measures to address this were identified as reviews of project implementation processes and institutionalizing PCP process. Embracing of research and development was additionally identified as an influencing factor towards improvement of timeliness in project completion. The identified components were harmonized and described in a process flow framework to guide building projects implementation in the public sector and provide a basis for institutionalization of PCP to positively improve timeliness of projects completion.

CHAPTER ONE

1.0 INTRODUCTION

1.1. Background

The construction industry is a key industry in the economy of any country worldwide. It is one of the biggest industries in the world contributing to around 10% of the global GDP (Nguyo, 1988). The resources utilized in this industry add to 50% of the world resources (Economy Watch, 2010). With such an impact on the world economy and resources, it is prudent that activities within this industry are efficiently and effectively planned. Every country in the world including Kenya to some extent has an active construction industry as virtually every service requires facilitation from the construction industry.

Kenya is a developing country still at the stage of providing basic building infrastructures such as health, education, agricultural, administrative as well as living facilities for its growing population. The construction industry contributes up to 5% of the National GDP as reported in the Economic Survey and contributes 10% to employment nationally (Republic of Kenya, 2010a). The public sector in Kenya is equally involved in the construction industry to provide for the basic infrastructure from where public services are offered. Its contribution is valued at 50% in terms of demand which is a significant proportion from a single Client (Nguyo, 1988). The provision of infrastructure consumes about 10% of the National Budget as indicated in the Printed Estimates (Republic of Kenya, 2011). With such significant proportions it is important that the implementation of construction projects are efficiently and effectively carried out and projects be delivered within planned time, budget and quality.

It is acknowledged in the Kenya Vision 2030 that a modern and result focused public service is a prerequisite for the country's socio-economic transformation (Republic of

Kenya, 2007). Further, the Constitution of Kenya in the Bills of rights gives every citizen the right to enjoy efficient and quality public services (Republic of Kenya, 2010b).

In undertaking projects, there are possibilities that a project is not completed within the planned time. When projects delay, development in many aspects is affected. This includes retarding the process of development and denying the Client the services the project is expected to provide. 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 when project planning issues are comprehensively addressed.

1.2 Preconstruction Planning

1.2.1 Planning

The whole process of planning requires clarity and specific intentions. A proper plan should be available where there is an intention to perform a task with a specific objective. The plan should address the pros and cons of the task at hand and specifically consider aspects of cost, time, quality and client satisfaction (Ramakrishna, 2010). In addition the plan should address the full scope of the task, the logical sequence of all the activities, resource allocation, quality, procedures, options, risk aspects and constraints. A further function of planning as explained in Chandra (2006) is that it has the important function of organizing work in the project, allocating responsibilities, providing for communication, coordinating between all those involved in the project, provoking people to look forward, instilling a sense of urgency and time consciousness and further establishing the basis of monitoring and control. Any process with specific objectives requires planning and this therefore is also true for construction processes. The following section focuses on planning in the construction industry.

1.2.2 Construction Planning

Construction planning is a necessary and challenging activity in implementation and management of construction projects. It involves making decision on technology, identifying tasks, assessing required resources and timings for specific tasks and how the various tasks interact. The construction plan is the basis of determining the project cost and programme of works (Hendrickson, 2000). Other than the technical aspects, Chandra (2006) agrees with that position that construction plans should include identification of project participants interrelationships and their roles in addition to the various organizations involved in the project. The author quotes Sherlock Holmes cited by Doyle (1930) as saying;

> "*Most people, if you describe a chain of events to them will tell you what the result would be. They can put those events together in their minds, and argue from them that something will come to pass. There are few people, however, who if you told them the result, would be able to evolve from their own inner consciousness what the steps were which led up to that result. This power is what I mean when I talk of reasoning backwards"*.

This last scenario describes the position of construction planning as the planner starts with a result. With these two approaches of reasoning it is therefore necessary to tie up the end with the process to avoid any unmet expectations. The tying up of activities towards achieving an objective with a timeline, scope and set resources defines a project which is what planning addresses.

1.2.3 Defining the Project

A project is a collection of works or activities planned to be completed in a predetermined period of time within an acceptable budget (Ramakrishna, 2010). This definition agrees with the other definition earlier mentioned. A project is also characterized by a job content referred to as a scope. A building construction project is undertaken when there is a demand for construction space to meet a specific need for which other alternatives such as use of existing facilities, leasing of appropriate facilities are not feasible to meet the objectives of the institution. The built facility requires to be implemented within the projected scope, delivered within the project budget and within the projected period. These building facilities maybe developed by any entity that has a need for the built facility including an individual, a family, a private company, a public entity, a government Ministry, department or agency.

1.2.4 Projects situation in the Public Sector

The focus of this study is building projects in the public sector in Kenya implemented by the Ministry of Public Works which has the mandate, through Presidential Circular 1/2008, to develop and maintain building projects for the public sector (Republic of Kenya, 2008). Records held by this Ministry shows that majority of the public building projects are not completed on time. Table 1.1 gives a summary on the performance of contracted projects with MOPW between the years 2005 to 2011.

Table 1.1 Schedule of completed projects from financial year 2005/2006 – 2010/2011

Financial Year	Projects								
	Stalled		New		Maintenance		**Total**		
	Proposed for Completion	**Completed**	**Proposed for Completion**	**Completed**	**Proposed for Completion**	**Complete**	**Proposed for Completion**	**Complete**	**Percentage complete**
2005/2006	152	60	78	23	27	6	**257**	**89**	**34.63**
2006/2007	113	43	84	34	32	11	**229**	**88**	**38.43**
2007/2008	27	14	93	37	38	9	**158**	**60**	**37.97**
2008/2009	22	12	100	40	40	25	**162**	**77**	**47.53**
2009/2010	15	6	120	34	40	18	**175**	**58**	**33.14**
2010/2011	14	3	150	43	60	3	**224**	**49**	**21.88**
Average Percentage Completion Rate (2005/2006 – 2010/2011)									**35.60**

Source: AWP 2011/2012, MOPW (2012)

Overall observation on the reasons given for delayed delivery include additional works, inadequate funding, slow progress by the contractor, delayed engagement of sub-contractors, delayed payments to the contractor,delayed inputs by the design teams, delays in decision making by the various players, inadequate briefing from the clients, delayed submission of projects requests resulting into inadequate designs, change of policy direction, amongst others (MOPW, 2009). Time and cost overruns in the construction industry are serious problems partly attributed to poor planning, lack of experience in related projects, fluid brief from clients and indecisiveness (Gichunge, 2000).

1.2.5 Preconstruction Planning

Most of the explanations given for the delay of the projects fall within the early planning stage of project development. This stage as referred to in this study is the preconstruction planning stage of a project. Federal Transit Administration (2006) defines preconstruction planning as being project initiation, planning and funding, environmental,

design, permitting, real property organization and bid and award. Goodman (1988) views preconstruction planning as the first phase of a project cycle with three basic tasks; identification and formulation of a project, feasibility analysis and appraisal, and design. The other phases of the project cycle are broadly, selection, approval and activation, operation, control, handover, evaluation and refinement as in Figure 1.1.

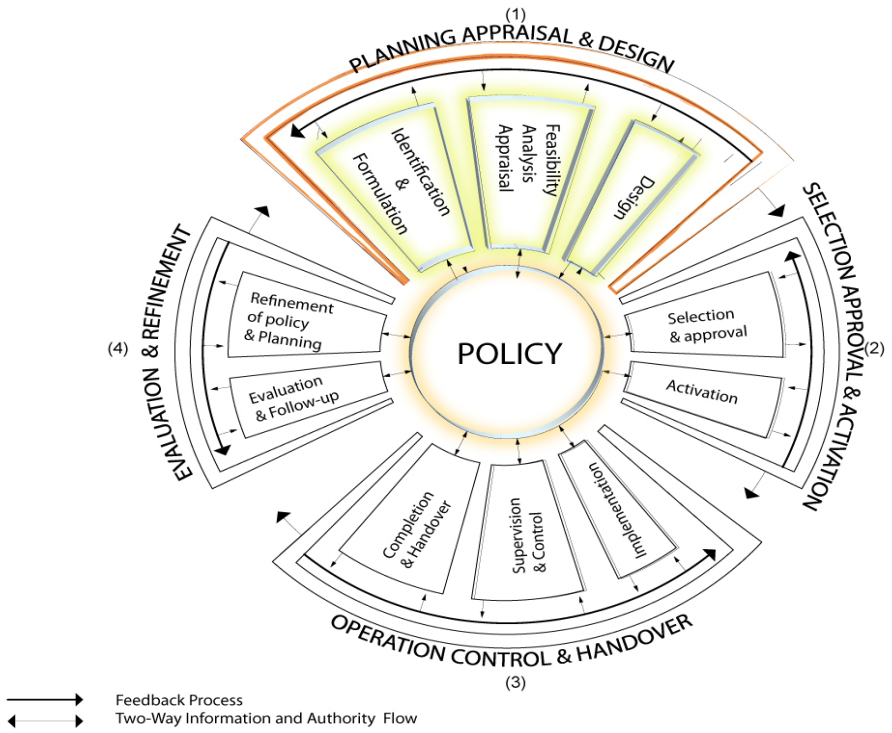

Figure 1.1 Project Cycle

Source: Goodman (1988)

The literature points out that at project planning important decision are made that would give a road map for smooth implementation of projects. Poor performance in terms of delay in project completion for the project undertaken by the MOPW for the public sector could therefore be partly attributed to inadequate preconstruction planning.

The area of project delays in the Construction Industry is a very important and popular area of study as evidenced by a number of studies in the area. Among them are Nguyo

(1988), Goodman (1988), Mbatha (1986), Mbaya (1984) and Gichunge (2000). Late delivery of a project affects the very objective a project is expected to address. It is therefore necessary to put the appropriate measures in place to ensure that the built facility provided meets the specific objectives of the strategic plan of the institution. The aim of this research is to explore factors at preconstruction planning that influence timeliness of completion of public sector building projects in Kenya.

1.3 Statement of the Problem

Project development is a process with specific objectives which begins with an intention and ends with an output. This process as Chandra (2006) establishes, requires planning as this has the importance of organizing work and allocating responsibilities. It also provides for communication and coordination between all the parties involved in the process. It further provokes people to look forward, instilling a sense of urgency and time consciousness. It additionally establishes the basis of monitoring and control for a project.

Studies have been undertaken on factors at preconstruction planning that focus on distinct issues such as project control, project forecasting, scheduling and technical aspects. This includes studies by Chandra (2006), Ramakrishna (2010), Talukhaba (1988) and Neal and Neal (1989). Recommendations of such studies have been used to prepare formal plans at firm or project level which have often not been fully utilized in project execution. This makes planning fail to live to its promise Laufer and Tucker (1987). Records with the Ministry of Public Works indicate that majority of the projects in the Public Sector are not completed as planned (MOPW, 2009). Studies attribute the reasons for delays in project completion to inadequate preconstruction planning among other factors. According to

Neal and Neal, (1989) it is possible to influence future events including project completion through planning.

The research study problem therefore is whether preconstruction planning is adequately undertaken for the projects implemented by the MOPW for the public sector in Kenya.

MOPW as provided for in Presidential Circular No. 1/2008 (Republic of Kenya, 2008) is mandated to provide and maintain building projects for the public sector in Kenya. However, there is no single reference document that details the factors at preconstruction planning in a harmonised framework to guide the process. Project implementation makes reference to different sets of documents such as Buildings Organization and Operations Manual (BOOM) (MOPW, 1974), ISO procedures (MOPW, 2010), Drawings Manual (MOPW, 2006), Public Procurement and disposal Act 2005 (Republic of Kenya, 2005) and the Public Procurement and Disposal Regulations 2006 (Republic of Kenya, 2006). The BOOM has not been reviewed since its first publication and it may have been overtaken by current developments.

Successful completion of a given project along the three critical dimensions of time, cost and quality, requires detailing all the planning requirements. This could be achieved by identifying preconstruction planning factors and describing them in a process that takes into account all the preconstruction planning aspects. The literature reviewed by the researcher did not identify such a study that explores the factors at preconstruction planning and describing them in a single process. This study explore the factors at preconstruction planning that influence timeliness of projects completion for the public sector building projects in Kenya and describe them in a preconstruction planning process flow.

1.4 Aims and Objectives

The aim of this study is to explore the factors at preconstruction planning that influence timeliness in project completion. The objectives of the study are to:

1. Establish factors at the preconstruction planning for public sector building projects that influence timely completion of project.
2. Explore the extent to which structured preconstruction planning is currently applied.
3. Formulate a framework for preconstruction planning for building projects in the public sector.

1.5 Research questions

The Research questions for the study are:

1. What are the factors at the preconstruction planning stage in the implementation of projects? This main question is further broken down into two sub questions.
    i. What are the processes of preconstruction planning
    ii. What is the institutional structure at the preconstruction planning stage?
2. To what extent is the preconstruction planning process applied in public projects? This main question is also broken down into two sub questions:
    i. To what extent is the preconstruction planning process applied?
    ii. Does efficient application of PCP improve completion timeliness?
3. How can the current pre-construction planning process be improved? This main question is further broken down into two sub questions:
    i. What are the causes of project delay?
    ii. How can the causes of delay be mitigated?

1.6 Assumptions

The assumption of the study was that the officers presently occupying the relevant offices would be willing and committed to participate in the study.

1.7 Justification for the Study

Delayed completion of a project has serious consequences including cost overruns, delayed use of the project which may further result in the project not meeting the set objectives. When the Client does not meet set objectives, realizing the strategic plan may not be possible which would eventually affect the achievement of the Client's vision, mission and the core mandate. This would affect service delivery to the citizens thus violating their constitutional right of access to better and quality services Republic of Kenya (2010). In addition, this would retard social economic development affecting realization of Vision 2030, Republic of Kenya (2007) and hence the essence of this study.

Majority of projects implemented within the Public Sector as contained in records with the Ministry of Public Works are completed outside planned completion time. It is therefore necessary to research into ways that would address this towards finding solutions that would improve timely completion of projects implemented by the MOPW for the Public Sector. It was earlier noted that this sector has a great impact on the national economy and therefore requires to be effectively and efficiently managed.

1.8 Significance/ Importance of study

The result of the study informs the operations of the Ministry of Public Works in improving the preconstruction planning process of project implementation and in effect improving timely project completion. It is expected that the MOPW will lead the process of having the research findings disseminated to all the stakeholders in projects

implementation process. The findings will also feed into the development of Public Works Policy and Planning. Most significant in this studying is that the findings will contribute towards providing efficient services to the people of Kenya.

1.9 Scope

This study was limited to building construction projects in the Public Sector in Kenya undertaken by the Ministry of Public Works within the last 6 years which is the period the Government has been monitoring performance using performance contracting in the various ministries. The study was further limited to projects supervised from the MOPW Headquarters in Nairobi.

1.10 Limitations

A major limitation was accessing projects which give clear processes of preconstruction planning and are well documented.

1.11 Definition of Terms

1.11.1 *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).

1.11.2 *Pre-construction Planning* is that stage of Project Planning spanning from inception of the project up to handing over the site to the Contractor for works to commence (Federal Transit Administration, 2006)

1.11.3. *Appraisal* is the detailed analysis of a project to verify its technical and commercial viability (Ramakrishna, 2010).

1.11.4. *Design and documentation* is the process that addresses aspects such as, establishment of design criteria, assessment of project risks, conceptual design, undertaking technical studies, developing engineering criteria, conducting value engineering, risk assessment and estimated cost. This also includes addressing construction schedule through the design process, preparation of final drawings and specifications (Federal Transit Administration, 2006).

1.11.5. *Timeliness in completion* is the projected completion time as indicated in the contract for the construction of the project.

1.11.6. *Ministry of Public Works* is the Ministry with the mandate for implementation of Public Sector Building Projects (Republic of Kenya, 2008).

1.11.7. *Public Sector* is the sector that provides services to the people of Kenya including education, health, infrastructure, communication, financial, judicial, public works, law and order and administration.

1.11.8 *Clients* are the Government Ministries, departments and Agencies (MDA) that require the built facilities to be provided by the Ministry of Public Works.

1.11.9. *Project Managers* are the professional officers in the Ministry of Public Works who are specifically assigned to each project to give overall guidance in the implementation of building projects (Republic of Kenya, 2006)

1.11.10. *Successful completion of the project* is completing a project within set objectives and meeting the scope, cost, time, quality, Client satisfaction and any other projected parameters.

1.12 Outline of the study

Chapter one gives the background to the study, defines the problem of the study addresses and states the aims and objectives of the study. The Research questions and assumption to the study are also articulated in this chapter. The justification and significance of the study is then explained. Additionally indicated in this chapter is the scope and limitation of the study.

Chapter two contains the literature review which includes the Planning philosophy, project management, the planning theory, project development, capital planning, feasibility and appraisal, value engineering, design & documentation, procurement planning & tendering, mobilizing, construction delays in public buildings, attributing parties and factors causing delays, examples of preconstruction planning, Ministry of Public Works processes at preconstruction stage ending with the conclusion to the literature, the identified research gap and the conceptual framework.

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

Chapter four follows covering the data collection, organization, response, data analysis, discussion on the findings and concludes with the description of the PCP process description and a process flow.

Chapter five gives the study findings, a summary of the findings provides a conclusion and recommendations to the study and possible research areas evolving from the study findings.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

2.1.1 Planning Philosophy

The broad principle of planning according to Neale and Neale (1989) is its importance in all construction projects and this entails expenditure. It is expected that the participants forecast the processes before a projects starts. Every manager must plan as planning is one of their functions. Planning is necessary so as to anticipate and influence future events. Further, for a manager to have control over a project, planning is mandatory since without planning it is not possible to undertake monitoring and evaluation. Two points emerge from the above review which are crucial to planning, commitment of senior management and providing sufficient resources to allow the planning function to be effective. Planning therefore involves a Manager, input of resources, commitment of management and continuous appreciation of the environment within which the planning is taking place.

Development of knowledge and skills is necessary for effective planning. The key to economic and social growth in all countries developed or developing is better management in all sectors; agriculture, industry, public works, education, public health and government (Goodman, 1988). With this appreciation and bearing in mind that the planning under study is on projects there is need that issues on project management and the project manager be addressed.

2.1.2 Project Management

The project manager is a key player in project management whose main purpose according Talukhaba (1988) is to coordinate activities and participants in construction

projects implementation. Clients are increasingly appointing project managers at the inception of projects so that they are more involved in the management of the projects Neal and Neal (1989). These Project Managers have the task of guiding the entire process of the projects implementation from inception to completion and handover of the projects. The need for the Project Manager is also appreciated by Gichunge (2000) who explains that design and production of buildings are complex processes that requires multi-skilled manpower with proper coordination to realise the project objectives.

Steiner (1979) cited in Laufer and Tucker (1987) ties in the planning aspect of the Project Manager saying that planning occupies a central position in the functions of a Project Manager with responsibilities varying with organizations and contingency as a philosophy and planning having a key role in project management

Docherty (1972) cited in Laufer and Tucker (1987) provides some shortcomings in project management where formal plans prepared at firm or project level decorate the Project Manager's office while the actual project execution is governed by informal short term planning performed by site management at times totally ignoring the formal plans. This in essence nullifies the very essence of planning if the planning is not used in execution. Project Managers would do well to borrow wisdom from Exodus 18:20 which says 'and you shall teach them ordinances and laws and shall show them the way wherein they must walk and the work that they must do King James (1611). Laufer and Tucker (1987) explain the reason of this shortcoming as stemming primarily from inadequacies of the qualifications, orientation and motivation of the parties involved. They put forward that this holds through the life cycle of planning from research and development right up to the utilization of the plans by top Managers. The Project Manager is therefore key in the

planning process of a project and the effectiveness of the Project Manager input depends on both the inputs and the application of the inputs.

2.2 Planning Theory

The term planning can be applied to the whole construction project process from inception, feasibility study to final commissioning and handing over of completed works Neale and Neale (1989). Ackoff, (1970) cited in Laufer & Tucker (1987) defines planning as a decision making process derived at in advance of project execution meant to design a desired future with suggested ways of implementation. Planning therefore answers the questions; what, how, by who, with what and when. The purpose of planning as explained by Laufer & Tucker (1987) is to assist the manager to fulfil his primary functions of direction and control in the implementation of the project components. Planning additionally involves coordinating and communicating with the many parties involved in the project implementation and project control. Project control involves monitoring and evaluating performance and taking corrective action when performance does not go according to plan. It is at the planning phase that many potential problems are identified proactively before they can greatly affect project cost and schedule George *et al* (2008). What is clear here is that planning is not just what, how, by who, with what and when, the aspect of monitoring and evaluation arises and action should be taken if issues do not go according to plan.

A Business Round Table report (BRT) of (1983) in Laufer & Tucker (1987) on planning and scheduling pointed out that planning has not lived to its promise. This calls for the need for contingency planning as clarified Ackoff (1970 cited in Laufer & Tucker (1987). This would entail preparing numerous alternative plans in advance to cater for most likely future environments. Nyandemo and Kongere (2010) however present a divergent

opinion on project planning. They argue that it 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. It is a process of listing in details what is required to successfully complete a given project along the three critical dimensions of time, cost and quality. This definition does not bring in the aspect of contingency planning which is a critical dimension in planning since things do not always work out as planned.

Laufer and Tucker (1987) citing Birrel (1980), BRT (1983), Fondatil (1982), Jaafari (1984) and Peer (1974) seem to attribute ineffectiveness of planning to that it has traditionally stressed the technical side of planning. However, with the exception of control and forecasting so little of the original purpose of planning is being pursued. Other researchers cited in Laufer & Tucker (1987) such as Gilbert (1983) have focused on project control while Lichterberg (1983) has looked into project forecasting. Clough (1972) cited in Laufer and Tucker (1987) further brings out a fundamental confusion that results due to over emphasis given to scheduling wherein scheduling is even referred to as planning. The different arguments seem to conclude that planning requires striking a good balance between technical planning, scheduling, project control and contingency measures.

Planning requires that roles and responsibilities are clearly identified. This can be effectively managed only if key players in the planning process are also clearly identified. Three players are identified in planning; corporate management, project management on behalf of the owner, project management on behalf of the construction company Ackoff (1983) cited in Laufer and Tucker (1987). Client involvement in a project immensely affects the satisfactory completion of the project. However, many clients do not clearly

establish project requirements before engaging professionals to undertake works. Therefore, arising from this it is recommended that professionals in the construction industry should strategically relate to the clients so as to advise them on the processes and procedures involved in the industry (Harris, 1983 cited in Talukhaba, 1988). Nguyo (1988) in his study also suggests that every client ministry should have in its employment in house professionals for the purpose of liaising with MOPW. He continues to suggest that where a client's workload does not justify the engagement of such a professional such an officer would be assigned more than one client ministry. Ramanujan *et al* (1986) cited in Laufer and Tucker (1987) adds another angle regarding the key players in planning indicating the necessity of constant political backing to ensure success.

Mbaya (1984) ties up the various positions of planning suggesting a system planning approach in projects management that coordinates all the participants on the implementation of construction projects. Hastrak *et al* (2008) supports this by indicating that participative management and employee involvement contributes to reduction of the project cycle.

The above discussions all seem to point out to the need of clear identification of the processes necessary for the planning, involvement of keenly identified key players and focused engagement of the players for complete ownership of all the issues identified in the planning. Having discussed the theory of planning there is need to look into the implementation of planning practice.

2.3 Implementation of Planning Practice

Planning in itself being a process needs to have guidance on how to go about it. The question should be on how to go about planning the planning process. Laufer and Tucker

(1987) provide that planning entails planning the planning process which the author suggests includes information gathering, preparations of plans, dissemination of information and evaluation shown in figure 2.1.

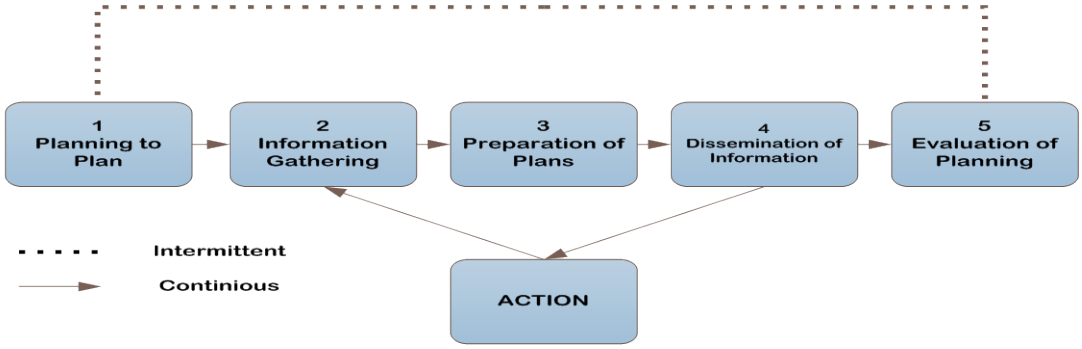

Figure 2.1 Planning process

Source: Laufer and Tucker (1987)

Phase one and five receive minimal attention with hardly any effect on project implementation (Laufer and Tucker 1987). The first phase which covers the uniqueness of every project which may not be covered by company planning manuals is hardly considered. The last phase, evaluation of the planning process is also hardly given attention, (Laufer and Tucker, 1987). Anditi and Koseoghlu (1983) referred to by Laufer and Tucker (1987) infers that the measurement of this stage is still in a primitive stage which can resort to subjectivity when empirical studies are applied. Phase 3 which involves planning of time and resources receives excessive attention. The second stage of planning is information gathering which include contract documents, drawings and specifications, site and environmental conditions, construction technology, internal and external production resources, productivity of labour and equipment, goals and contracts effected by top management, the Client, and the other parties. All these regard quality control, finance and law related regulations. Stage 4 of planning which is information

dissemination as practiced today is inefficient, (Laufer and Tucker, 1987). Laufer and Tucker (1987) point to a disconnect on the flow of information at the company and planning level and the actual construction.

When planning has excessive emphasis on control, Anditi and Koseoglu (1983) cited in Laufer and Tucker (1987) construe that this has negative effect on site managers. Barnes (1981) and Gilbert (1983) cited by the same author says that excessive emphasis can cause delay of works as site management prefer to use energy preparing justification of what happened earlier instead of improving plans for later works.

The main flaw in planning is that there is over emphasis on schedule while method planning is not given adequate attention and control also has higher emphasis as opposed to action planning. In addition, advance formal planning does not set direct implementation but seem to guide the formal plan. It is therefore recommended that for planning to become effective, methods should be changed, policies and assumptions modified and the overall perspective of project management be reviewed. Planning effectiveness can therefore only be expected after management planning policy and prevailing practices are fundamentally changed (Laufer and Tucker, 1987). Planning should therefore not just be planning for planning purposes but should be monitored and evaluated to ensure that there is value addition to the implementation process. All inputs to the process should be followed up to ensure that the specific inputs meant to affect a particular area of the process actually get to that area. There are instances that programmes are prepared but these end up decorating walls on site. Having discussed planning in general, the following section takes the focus of the study which is preconstruction planning.

2.4 Preconstruction Planning

As was observed earlier in overall planning, preconstruction planning is perceived in different ways by various players. Chandra (2006) describes preconstruction planning as project development and preliminary engineering, bidding and contract negotiation, engineering design and purchase and procurement. Laufer and Cohenca (1986) cited in Laufer and Tucker (1987) suggest that the duration of preconstruction time is guided by the construction cost and the contract period. However, this might not always be the case as complexity among other factors also affect the duration.

This author gives an example that for a $20million project and contract period of 18 months, 3 months are invested in preconstruction planning. Kerzner (2001) also underscores this fact by pointing out that, in a complete project life cycle, as much as 50 per cent of direct labour hours and dollars can be spent before execution begins reason being that quality must be planned for and designed.

Ahuja and Nandakumar (1985) cited in Laufer and Tucker (1987) identify an additional factor in preconstruction planning giving forecasting as a function of preconstruction planning. By forecasting early reorganization of events that affect project progress help in reducing effects of particular events with George *et al* (2008) adding that front end planning allows the project team to have greater influence over the project. Wang (2002) cited by Gibson *et al* (2006) on the other hand gives different emphasis providing that a project team should identify, address and document the right scope definition elements to ensure that the project has a good design basis in order to provide a smooth transition from the project planning to tenders and construction. Gibson *et al* (1995) cited in Gibson *et al* (2006) defines pre project planning differently from the earlier authors explaining pre project as the process encompassing all tasks between project initiation and the

beginning of detailed design as shown in Figure.2.2. Here again we find the stage of planning to plan the planning process.

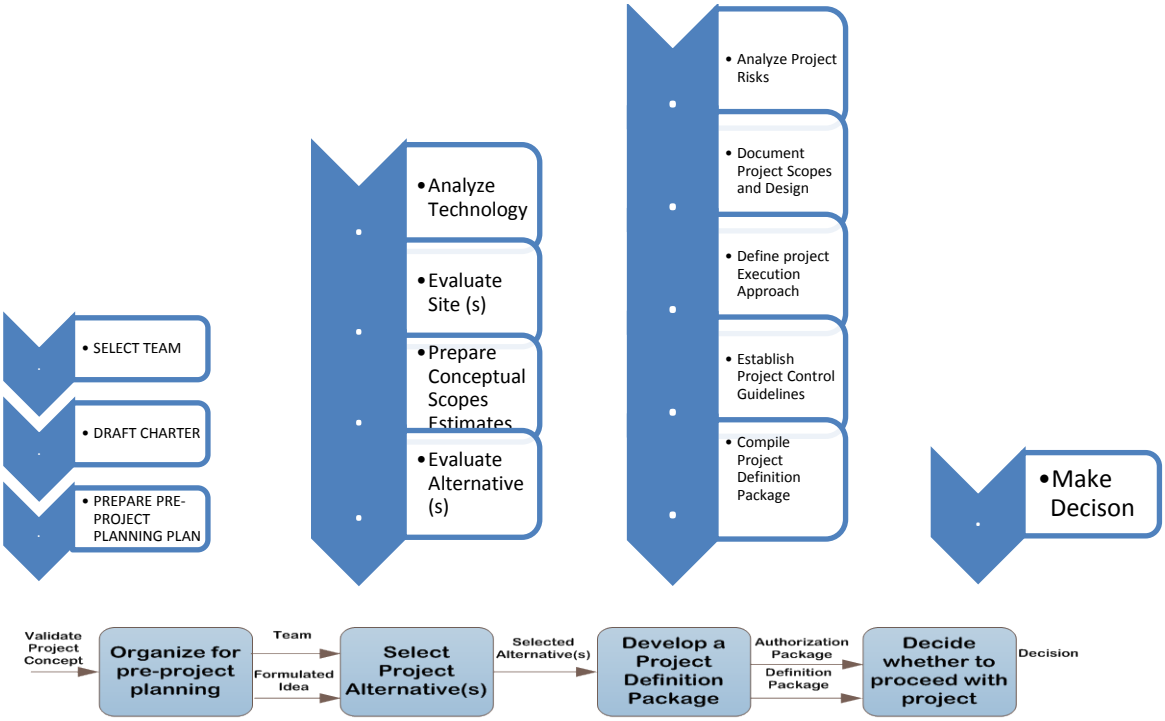

Figure 2.2 Pre Project Planning

Source: Gibson *et al* (2006)

Gibson *et al* (2006) recommends that in preplanning, a standard pre planning process should be used involving technically proficient personnel with owner involvement ensured. The project team should pursue the right project and the project should be aligned to business drivers. The team should understand the client organization behaviour and uphold sound technical skills and business acumen.

A wider perspective of preplanning identifies coordination of various aspects of planning such as people, organizational activities and processes as great challenges in the early planning stages of a project. Planning enables the coordination of such aspects as merchant banks, legal and planning authorities, Contractors, sub-contractors and specialist

suppliers, projects management consultants, designers, quantity surveyors/building economists and other specialist consultants (Neal and Neal, 1989). Kerzner (2001) on his part summarizes the elements in project life cycle into six phases, conceptualization, feasibility study, preliminary planning, detail planning, execution and commissioning. Here, there is the suggestion that preconstruction planning is up to detailed planning which could be interpreted in different ways.

Preconstruction suggested by Goodman (1988) provides the stages as, project idea, project identification, brief, project formulation, short listing of viable projects, feasibility study and appraisal, selection and approval ending with design and documentation. Figure 2.3 shows a 'value stream mapping', generated from the concept of planning, appraisal and design suggested in Goodman (1988).

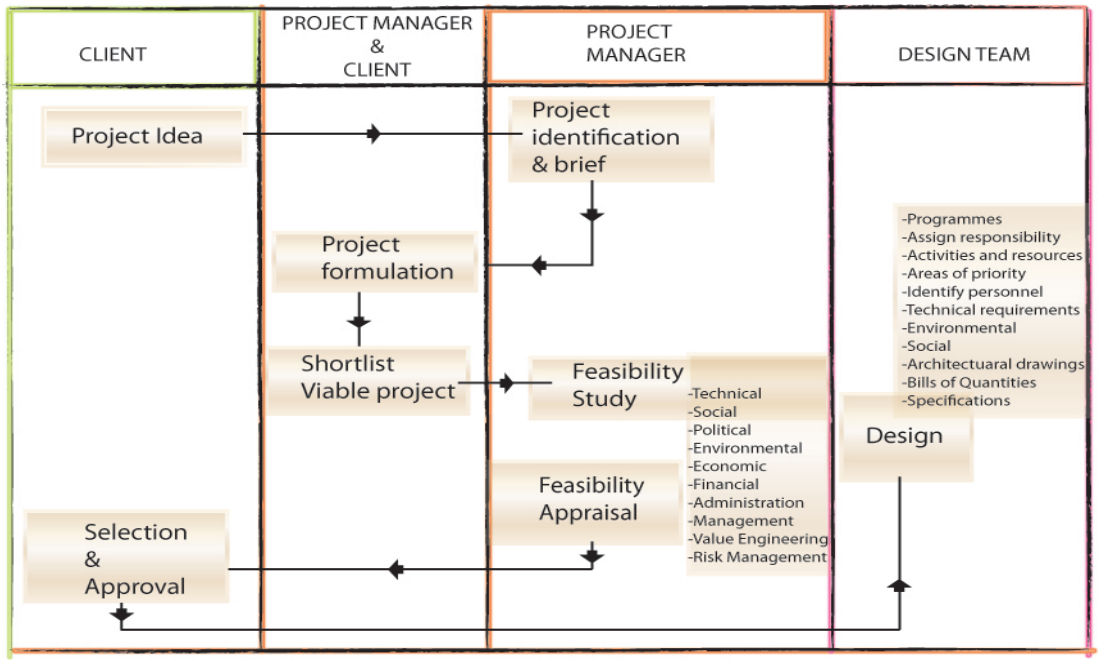

Figure 2.3 Value Stream mapping of PCP

Source: generated from Goodman (1988)

A survey undertaken by George *et al* (2008) concluded that seven activities at preconstruction planning are critical for achieving project success. These are activities related to public relations, start-up requirements, safety and quality, scope and execution planning and site utility consideration. Various studies agree that PCP is a key element to overall project success (Gibson *et al*, 1995, Webster, 2004, Smith, 2000, Hartman and Ashrafi, 2004 and Construction Industry Institute, 1995 cited by George *et al*, 2008).

Preconstruction planning is therefore a process that gives value for money, allows all aspects that impact the implementation of the project to be identified and properly positioned in the implementation of the project. This planning allows the participation and input of all critical stakeholders in the project before the actual construction works commences. The various definitions all seem to provide for the need to pre-plan indicating specific aspects of planning to ensure successful completion of projects. Reference is made to the general success of projects when preconstruction planning is applied whereas this research thesis purposes to specifically address preconstruction planning in relation to timeliness in project completion. In as much as there is the general appreciation of the entire preconstruction planning there appears to be specific emphasis to project development which is briefly discussed in the following section.

2.5 Project Development Planning

Eilon (1971) cited in Laufer and Tucker (1987) defines the first stage of preconstruction planning as defining scope of the project, the goals to be met by the project, the resources for the project and suggests the way forward in realizing the project. Smith and Tucker (1983) cited in Gibson *et al* (2006) states that development of the project scope definition package as one of the major tasks in the pre project planning process. Poor or inadequate scope definition negatively contributes to the project success during the detailed design.

Start up and construction phases of a project substantially depend on effort expended at the scope definition phase. The scope definition as defined by this author relates to site assessment, equipment identification, flow design and design parameters. Critical project scope risk issues require to be addressed at this stage (Gibson *et al* 2006).

Federal Transit Administration (2006) identifies project development as consideration of an Agencies strategic plan, mission and vision and the strategies to be adopted to achieve goals and objectives. Out of these considerations, assets required to accomplish its strategies are identified and the projects are then worked out from the gap of existing assets and needed assets. Decisions on projects to be developed depend on public policy, public financing, capital and operational budgets. This process flow is shown in Figure 2.4.

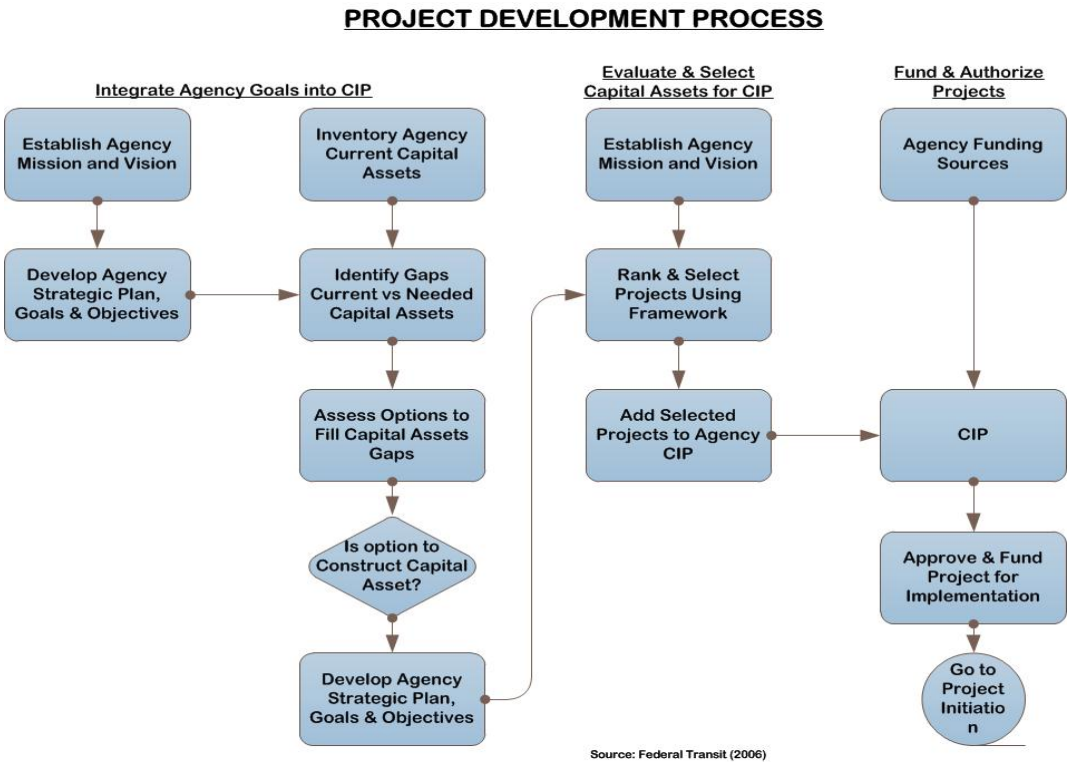

Figure 2.4 Project Development

Source: Federal Transit Administration (2006)

Guidelines on the stage of project inception include; working out what the project will deliver using a template known as 'project requirement definition' and how the project is to be delivered using a template referred to as "Project Management Plan". Project deliverables include authorization of project, stakeholders, scope of work, cost estimate, schedule and milestones, finances, risks, resources constraints acceptance (Federal Transit Administration, 2006). Goodman (1988) suggests a similar process which entails identification and formulation, a process of translating the project ideas into project briefs for preliminary assessment and short listing of viable projects. The importance of this stage of project development in preconstruction planning cannot be over emphasized as it sets the stage for successful implementation of the project ensuring that it is a project that will contribute to institution's success without incurring expenses in feasibility and then realise the project is not viable. This stage allows early detection of viability of a project and allows for early identification of funding for the project. Funding for a project comes in a process of capital planning as briefly mentioned in the following section.

2.6 Capital Planning

Chandra (2008) explains that capital planning is a phase of capital budgeting that includes analysis, selection, financing, implementation and review, with capital planning being the first phase with a to and fro process within the various phases. Capital planning has to do with the broad investment strategy and preparation and assessment of project proposals. Capital planning provides a guideline for the identification of individual project opportunities where a project proposal is identified. A preliminary project analysis is undertaken prior to a detailed feasibility study to assess whether a complete feasibility is required and what aspects are critical to the viability of the project for further in depth study and appraisal. Ramakrishna (2010) holds that owing to scarce resources, an

organization cannot afford to be over ambitious and undertake all its future projects at one time. He goes on to say that listing of future projects and selection of profitable projects for implementation must be done at higher levels in an organization or with the help of expert consultants. As mentioned earlier preconstruction takes time and it is therefore useful that it is appreciated early whether a project should be taken further for feasibility study.

2.7 Feasibility study and Appraisal

Feasibility study is defined by Ramakrishna (2010) as detailed analysis of a project to verify its technical and commercial viability. This consists of the distinct parts, analysis and appraisal. Feasibility analysis therefore determines whether a project is implementable whereas appraisal is the process of evaluating of a project to determine whether if the project is implemented will be successful (Goodman 1988). The projects identified from feasibility analysis are then presented as documents for selection and approval by the client top management.

The feasibility analysis and appraisal involves the factors that affect the implementation of a project such as technical, economic, social political, environmental, management and administration, financial and risk management (Goodman, 1988). Kerzner (2001) also puts feasibility study as the second phase in project life-cycle. User involvement is critical according to Kerzner (2001) and the user must supply much of the required effort and information and in addition must be able to judge the impact of alternative approaches. He goes on to add that, solutions from the study must be operationally, technically, and economically feasible. Much of the economic evaluation must be substantiated by the user. Kerzner (2001) concludes that the user must therefore be highly qualified and

intimately familiar with the workings of the organization and in reference to this study the public sector needs to be well understood.

Young (2006) indicates that the selection of projects requires an organization to plan ahead using adequate intelligence gathered from the market place and customers.

Nyandemo and Kongere (2010) also in agreement undertake that projects comprises of a series of conscious and predetermined actions by responsible agents who undertake the rational allocation of resources so as to create social and economic change.

Feasibility study and Appraisal is within the second phase of the planning information gathering wherein the major challenge is the manner in which uncertainties are approached (Laufer and Tucker, 1987). Construction receives a high rating of uncertainty (Duncan, 1972 and Lawrence, 1981cited in Laufer and Tucker, 1987). A good planner keeps an open mind to all information gathering methods including his own active participation and makes his choice according to the situation.

Laufer and Tucker (1987) suggest that in gathering information including information in feasibility stage, field and head office staff should be interviewed. Feasibility study and appraisal is a critical stage in the construction planning as this confirms the viability of a project. Nguyo (1988) attributes project delays as being caused by lack of exhaustive feasibility studies prior to commencing construction works. Talukhaba (1988) recommends that detailed site investigation and documentation need to be undertaken to avoid projects variations. Heldman (2009) on his part recommends that the group of people conducting feasibility study should not be the same people who will work on the project. He holds the opinion that project team members might have built in biases toward the project and will tend to influence the feasibility outcome toward those biases.

The foregoing statements imply the importance of undertaking feasibility studies and analysis in making decisions to implement a project. This process should involve responsible levels of the implementing agent and expert consultants in the area of the project. Feasibility study tests a specific project however there should be the method of identifying these specific project as a solution to meeting a client's strategic objective. This process is value engineering.

2.8 Value Engineering

Value engineering said to be a subset of value management is defined by Kelly *et al* (2007) as the process of identifying and optimising on cost during project implementation or alternatively defined as the process of making explicit the functional benefits required by a Client from the whole to part of a project at optimum cost during the implementation of a project. Value management is defined by the same author as the process by which the functional benefits of a project are made explicit and appraised consistent of a value system determined by the Client.

Value engineering is a useful process which interrogates whether a project, as a solution to a need, optimally answers to the Client objectives economically, technically and functionally. The process also has the advantage of enhancing proposed solutions. Dallas (2006) explains that value management provides for a process that maximizes value in answer to Clients requirements in addition to fulfilling the Clients' requirements. Kerzner (2001) refers to this stage as the conceptualization phase that entails brainstorming and common sense. He outlines two critical factors at this stage which include identifying and defining the problem and the potential solutions. In a brainstorming session, all ideas are recorded and none are discarded. The brainstorming session works best if there is no formal authority present and if the time duration is no more than thirty to sixty minutes.

Value Engineering identifies essential functions and develops methods to achieve these functions with the lowest life cycle cost. Value Engineering benefits include decreased cost, increased benefits and improved quality (Pulasti and Horman, 2005 cited in Song *et al,* 2009). The Federal Transit Administration (2006) records that all projects whose estimate exceeds $ 2million should apply Value Engineering Techniques. Applying value engineering allows a client to implement the ultimate project that meets the set objective within projected time, quality and cost. Younker (2003) explains that users of value engineering believe that essential aspects of a project can be achieved without sacrificing performance or quality of a project.

The main focus in value engineering is functions not just parts of a mechanism and that solution can be customized to suit the needed function resulting to projects which are easily constructed, operated and maintained (Younker, 2003). This author acknowledges that Value engineering additionally has the advantage of improving projects understanding amongst stakeholders and creating better working relationship. The value engineering functions would include designs, procurement, and marketing. The process evolved in this process ensures skilful use of the resources of capital, labour, materials equipment and construction time. Value engineering allows for successful ventures and is a process that is continually applied at any stage of project implementation which has varied options. Once a project goes through value engineering feasibility study and appraisal and is identified as the ideal project to answer to the Client's need, designs and documentation can be undertaken.

2.9 Designs and Documentation

2.9.1 Designs

Design is the process that follows once a project is determined viable based on the feasibility study. Goodman (1988) emphasises that design is a critical function which establishes the basic programmes, allocates responsibilities and determines activities and resources. All inputs relating to the project including the preparation of blue prints and specifications for construction facilities and equipment are prepared. The design task also includes operating plans and work schedules. Other aspects include personnel, skills and technical requirements are determined at this point. Environmental factors, social criteria, processes and procedures must be assessed and included. All these are brought together in a formal implementation plan. Contingency plans may also be prepared. Designs bring together the views of policy and decision makers and technical experts in such a way that the design reflects the inputs of all persons to the project.

This stage however has its own challenges. Design participants undertake project design with inadequate data on project requirements, funding and site conditions resulting in inadequate provisions. The inadequacy is attributed to poor coordination of stakeholders during design and documentation and unclear processes of tying up this stage (Nguyo, 1988). Talukhaba (1988) recommends that clients should be clear on requirements before approaching a design team to limit variations which can affect completion time. The earlier mentioned processes of project development, capital planning, feasibility study, value engineering respond to this challenge.

Other than the traditional approach to preconstruction wherein the contractor comes in at the last stage, Laufer and Tucker (1987) suggest constructability planning where the

contractor comes in early and detailed design and broad construction solutions are considered. Early involvement of the contractor allows the contractor's input in the preparation of schedule, the budget, choice of materials and construction methods as well as knowledge of supplier lead time and reliability (Gil *et al*, 2004 cited by Song *et al* 2009). Unlik and Lores (1998), CII (1986) and Pocock *et al* (2006) cited in Song *et al* (2009) provide that it is essential to appreciate how construction knowledge can effectively be incorporated into the design process for performance improvement. This is however a challenge when it comes to the traditional procurement systems that are applied in the public sector in Kenya.

The Federal Transit Administration (2006) in contrast to Goodman (1988) identify design aspects as; establish design criteria and assess project risks, perform conceptual design and preliminary engineering in consideration to environmental aspects, undertake technical studies, develop engineering criteria and conduct value engineering and risk assessment, estimate cost and construction schedule through the design process, prepare final drawings and specifications and coordinate design submissions and reviews develop and apply internal Quality Assurance and Quality Control Criteria, update cost Estimates and produce final design drawings and specifications for the construction bid documents.

Gibson *et al* (2006) explains that failure to properly address design issues in pre project planning could severely impact the cost and schedule performance of the project. Hastak *et al* (2008) gives design effectiveness as radically reducing project cycle time. From these definitions of design stage, it is clear that if this stage of the preconstruction is not comprehensively defined and addressed the success of the project would be greatly compromised. Further since there seems to be different understanding of this stage, it is necessary that the specific aspects be well articulated. As we note the different

appreciations of what design is there in need to highlight that for the public projects in Kenya there is a guide for the preparation of drawings (MOR & PW, 2006).

2.9.2 Project Manager's Handbook

Federal Transit Administration (2006) indicates that a Project Manager's Handbook provide guidelines for use in undertaking construction projects. The Handbook provides a comprehensive introduction to construction project management and principles applicable in all phases of the project. The phases include project initiation, environmental aspects, design, construction, commissioning and close out. The Chartered Institute of Buildings (1992) defines a Project Manager's Handbook as the guide to the Project Team members in the performance of their duties, identifying respective responsibilities and detailing the various activities and procedures and gives the seriousness of this by indicating that the handbook is often referred to as the project bible. The duties are those that relate to design, construction and completion of a project to the required quality within the parameters of the contract budget and to programme. This code identifies contents of the Handbook to include, parties to the project, third parties, roles and duties of the project team, project site, General administration and correspondence.

Other provisions are administrational such as contract conditions procedures, tender documentation, claims indemnities, insurances and warranties. Also addressed in the handbook are issues of design coordination, variations and instructions, cost control and reporting, planning programme and progress reporting, meetings, selection and appointments of Contractors, safety health, environmental protection and quality assurance. Disputes, furniture and fittings provided in the project, outstanding works and rectification, commissioning, completion, handover of project and occupation are also

given guidelines for in the handbook. The use of the handbook removes all ambiguities and confusion thus contributing to better performance for the project.

2.10 Procurement Planning and Tendering

2.10.1 Procurement Planning

Procurement is defined by Lyson and Farington (2006) as a process of obtaining goods and services. The purpose of a procurement plan is to define the procurement requirements for the project and how it will be managed and include all stages to contract closure. The plan identifies and defines the items to be procured, the type of contracts to be used in support of project and the contract approval process and decision criteria.

Laufer and Tucker (1987) indicates that often formal planning seem to give emphasis on the planning scheduling, giving lesser emphasis on resource allocation and cash flow implications. The important issue of how to carry out the work does not receive adequate attention. The writers clarify that as much as no schedule is prepared without some implicit knowledge of the methods, explicit plans for methods of carrying out works is absolutely necessary. Steiner, (1979) and Hussey (1982) cited by Laufer and Tucker (1987) state that 'Planning without plan is a waste of time'. This author points out that method planning is given less emphasis than time and cost as this later two are more tangible, demonstrable and economically measurable. Laufer, (1985) in Laufer and Tucker (1987) bring out the fact that most construction management programmes have more emphasis on production management than construction processes.

As an example Laufer and Tucker (1987) guide that to address issues of constructability, constructive experts may be brought in the early stages of planning. Benefits from early construction involvement of owners include, but not limited to, improved schedule, cost,

safety, quality and performance (Gil *et al,* 2004, Jergeas, Put, 2001, Unlik and Lores, 1998 cited in Song *et al,* 2008). Gibson *et al* (2006) states that the project team must choose the right approach to project execution during the preplanning stage. This task would involve setting cost and schedule baselines, choosing the right contracting strategy, focusing on the procurement process for long lead items and setting up a project control system.

Federal Transit Administration (2006) gives various forms of project delivery that maybe considered in the procurement planning. These forms of delivery are own forces delivery, where the owner manages designs and constructs project with own forces, design/bid/build, Construction Manager at risk where owner retains a Contractor in final design who participates in design review, estimating and value engineering and later agrees on a fee to manage and carry out construction. Design/build is yet another delivery option where the Contractor's staff compiles design and construct project. Design/build/operate/maintain is yet another mode of delivery in addition to Turnkey delivery method where the owner prepares a specification used for bidding for a Turnkey Contractor who may also finance the project.

The Agency considers various factors in the procurement plan which includes types of contracts to be used. Choice of contract type depends on the nature of the service/product purchased and choices on the division of risk between the owner and Contractor. The choice also depends on who estimates the expected contract price, who develops the scope of work statement for the contract, use of standardised procurement documents and any special documents needed. Integration of procurement lead time into the project schedule, incorporating contractual delivery dates into contracts and coordinate with the project schedule are also aspects of procurement planning. Use of performance bonds and/or

insurance contracts to meet the project's risk management objectives, including liability and insurance conditions and minimum limits to be met by the Contractor are procurement planning consideration.

Establishing valuation criteria to assess the selection of Contractors, definition of the procurement procedures for preparation of procurement documents, advertising, bidder conferences, any bidder pre-qualification, receipt of proposals/bids, bidder interviews form part of the plan. Selection, contract price negotiation, contract award and handling of protests are also considered. In many instances the procedures used for project procurements will be those the Agency already has in place. Defining a goal without planning the processes of how to reach the goal would be futile hence the need to give due attention to procurement planning at the pre-construction stage as the various approaches to procurement are noted and the appropriate method should be identified depending on the circumstances of the project.

The Public Procurement and Disposal Act 2005, Republic of Kenya (2005) provides for legislation whose purpose is to establish procedures for procurement and the disposal of unserviceable, obsolete or surplus stores and equipment by public entities. The objectives of the act include maximizing economy and efficiency. The Act identifies the entities in procurement process as including accounting officers, an advisory Board, the Public Procurement Oversight Authority, Candidate/Contractor, Director General, Minister, Procuring Entity. The application of the act is explained as including, procurement by a public entity, contract management amongst others. The act provides for threshold matrix and segregation of responsibilities and assigns responsibilities of complying with the act. Qualifications to be awarded contracts are clearly stated in the act. The act also provides

for termination of procurement proceedings, forms of communication, participation in procurement, what constitutes conflict of interest amongst other provisions.

Public procurement and disposal regulations, Republic of Kenya (2007) provides for the public procurement disposal regulations as empowered by the public procurement and disposal Act 2005 Republic of Kenya (2005). These regulations provide for the entities and roles of the various entities in the stated procurement processes. The entities include; accounting officers, procurement units, user departments, procurement committees amongst others. The regulations provides for various procedures used in procurement. The act and regulation gives clear guidance on the issues of tendering for public sector projects. This however does not give flexibility in project delivery methods in response to emerging trends earlier discussed.

2.10.2 Tendering

The tendering process is a process that leads to the identification of the Contractor to undertake works. Nguyo (1988) alludes to unprofessional practices which result in awarding of contracts to incompetent Contractors who can cause delays in completion of works. Talukhaba (1988) in his study concludes that the method of tendering is a factor in time overruns. He suggests that contract periods often determined during tendering process often give an illusion of project delay when this is not scientifically determined.

The legislation guiding procurement in Kenya provides for various kinds of tendering and the procedures to be followed in this tendering procedure up to the signing of tender. The types of tender include; open tendering, international tendering and alternative procurement procedures such as restricted tendering and direct procurements. The act also provides for request of proposals for procurement of services with associated procedures.

Provisions to ensure compliance with the act are also provided (Republic of Kenya 2005). Public Procurement and Disposal Regulations is empowered by public procurement and disposal act 2005 (Republic of Kenya (2007). These regulations include entities and the roles of the entities in the stated tendering processes and timelines and the entities include tender committees, evaluation committees among others. It is therefore quite apparent that the area of tendering in the public sector is relatively well articulated and the challenge as stated by Nguyo (1988) is really the enforcement and discipline in application.

2.11 Project mobilization

There is need for clear transition from the stage of preconstruction as defined for the purposes of this study to the actual construction for the project. This is the stage referred to as mobilization. Standard tender documents PPOA (2006) provide for advanced payment to the Contractor which is given at the discretion of the accounting officer of the government departments.

The project implementation processes of the Ministry of Public Works also provides for pre-contract meeting whose agenda is to provide clarification to all the clauses of the contract document and ensure all documents are fully circulated to the implementation team. The agenda of this pre-contract meeting include attendance, preamble, scope of works, contract data and details, date of possession, identification and naming of personnel handling the project. Handing over of all drawings, issuing of priced bill of quantities, identification of any known discrepancies between drawings and bill of quantities are addressed. Additionally articulated are procedures to be adopted when any other discrepancies become apparent. Contract documents in order of priority are, performance bond, insurance, statutory notice. Working hours and fair wages, access to

site, security arrangement issues are also positioned. Site office, storage of materials, sign board subletting of works issues are taken care of in these meetings, determination/termination, certificate of payments, taking over partially and/or completed works, schedule of visits/inspections, programme of works are all addressed in this precontract meeting.

2.12 Attributing parties and factors causing delay to project completion

A delay happens out of a commission or an omission and for any of this to be there is bound to be an entity or an occurrence which is the cause of this. This short section provides a few examples of this scenario. Al Ghafly (1995) cited in Sadi (2005) attributes project delay to issues related to owner involvement, Contractor performance, poor early planning, design of the project, financial problems, changes in the design, scope, delay in making decisions, approval by owner, difficulties in obtaining permits, coordination and communicating problems. The same author cites Chan and Kumaraswamy (1998) as having found out that the five principal factors in project delays are poor risk management, poor supervision, unforeseen site conditions, slow decision making, Client initiated variations and work variations. This author recommends that detailed studies can be done to evaluate involvement and effect of a specific party or resource of construction project to the time overrun in construction projects.

2.13 Construction delay in public buildings

Ayman (2000) in an article titled ‘Construction delay: a qualitative analysis’ undertook a survey of 130 projects in the public sector where delay was attributed to poor design, negligence of the owner, change orders, weather conditions, late delivery, unstable economic conditions and increase in quantities. The author indicates that construction

delay and overrun is a critical function in construction of public projects and this has been of great interest to construction researchers but has not been well understood in the case of public building projects. Factors attributed to delay mentioned in this study can be identified early during the preconstruction stage and mitigation measures put in place (Nyandemo and Kongere, 2010).

2.14 Examples of preconstruction planning

In this section specific examples where preconstruction has been articulated are given.

2.14.1 The Malaysian Example of the process of planning, appraisal and design

In Malaysia, there exists a government circular which instructs government departments that there should be a continuous feedback dependency relationship among the task and between planners, implementers and policy makers. Each task is dependent upon and influenced by the others and therefore the feedback and response communication link between the various individuals involved is an important part of the project cycle. Therefore, there is a vital need to have a two way communication between the policy makers and the Project Managers to ensure that the outcome of the project is in line with the policy maker's decision (Prime Minister's Department Malaysia, 1992). This position is in agreement with the various positions described earlier in this chapter including project development, capital planning and ownership of project at all levels.

2.14.2 Preparation for the London 2012 Olympics

Thirty ninth report of the session 2006 -2007, House of Commons (2007) include, issues of strong governance and delivering structures, delivering the games against immovable deadlines, the requirement for the budget to be clearly determined and effectively managed. Applying effective procurement practices, planning for a lasting legacy,

effective progress monitoring and risk management arrangements and impact on the other nations lottery games are considerations in the preparations. The report shows a clear involvement of policy makers, in this case the House of Commons, in the preplanning of the projects. Issues of budget, procurement, control, management earlier highlighted in preconstruction planning are emphasized in this international project.

2.14.3 General Example

A summary of five research projects by Gibson *et al* (2006) conducted over 14 years, regarding pre project planning processes which covered over 200 capital projects, with input from over 500 industry practitioners and reviews of the project planning processes used by more than 100 organizations had the following findings. Pre project planning is a process that positively impacts project performance and is a mandatory project process that requires consistent application. A project team has to ensure they undertake the right project by considering critical aspects which include building use, building requirement, criteria of site selection, financial analysis, business plan, future refurbishments, existing facilities. The project Team to ensure the development of right work product by considering aspects that include environmental issues, geotechnical, design, programme, accommodation schedules, services and structural designs. The team to ensure the right approach to design and construction by considering aspects that include schedule, cost estimate, equipment and materials, risk management, project control and delivery methods amongst others. This study clearly articulates specific issues that require to be addressed in pre project planning further emphasizing the need for every project manager to provide a project handbook.

2.15 Ministry of Public Works Processes at Preconstruction Stage

As the MOPW implements project for the public sector there are processes that are followed which define the preconstruction process. This process is guided by standard documents that are looked into in the following section.

2.15.1 Standard Tender document

The standard tender document PPOA (2006) includes details on the invitation of tender. Also included in the document is the instruction to bidders detailed as general information, tender documents, submission of tenders, details on tender opening and evaluation, the award of contract and government position on corrupt and fraudulent practices in tender. Conditions of the contract are well articulated in the standard tender document and the details include Project Managers decisions, delegation, communication, relationship of sub-contractors and main Contractor. Issues of personnel, safety on the site, work programme, possession of site, access to the site and other aspects of the construction process are discussed in the document.

Conditions of contract require the contractor to provide insurance as indemnity against various events during the construction stage. The document also contains appendix to the conditions of contract, specifications, drawings, the bills of quantities and the standard forms used in the tender document. These standard forms include, the form of tender, letter of acceptance, forms of agreement, bank guarantees for advance payment, qualification information, details of subcontracts amongst others. The letter of acceptance instructs the contractor to provide a performance Bond and work programme prior to the signing of the contract.

2.15.2 Drawing Manual

The Drawings Manual, Ministry of Roads and Public works (2006) is a guide to the production and management of drawings. This manual provides information for purposes of design and documentation which include media and presentation, drawings classification guide, numbering and referencing of drawings, monitoring tools documents preparation, production and coordination, and management and storage of drawings. This guide allows for coordinated production of designs and documentation for public projects in Kenya. As different institutions and authors seem to define issues of preconstruction in different ways there is need for this to be clear for every project and this is possible with the use of a Project Managers handbook discussed in section 2.9.2 specific for every project.

2.15.3 Building Organization and Operations Manual (BOOM).

The Building Organization and Operations Manual, MOW (1974) is a document whose purpose is to provide the officers of the Ministry of Works with the knowledge of the procedures required to design, construct and maintain government building. The contents of this manual include, building department services, building department organization and functions, project approving authorities, job planning and control procedures, contract procedures, building maintenance procedures, administrative procedures which are yet to be published, minor development job procedures and budgeting estimate procedures. This manual also contains several templates for the various procedures in the document. Figure 2.5 gives a representative preconstruction process flow suggested in this manual.

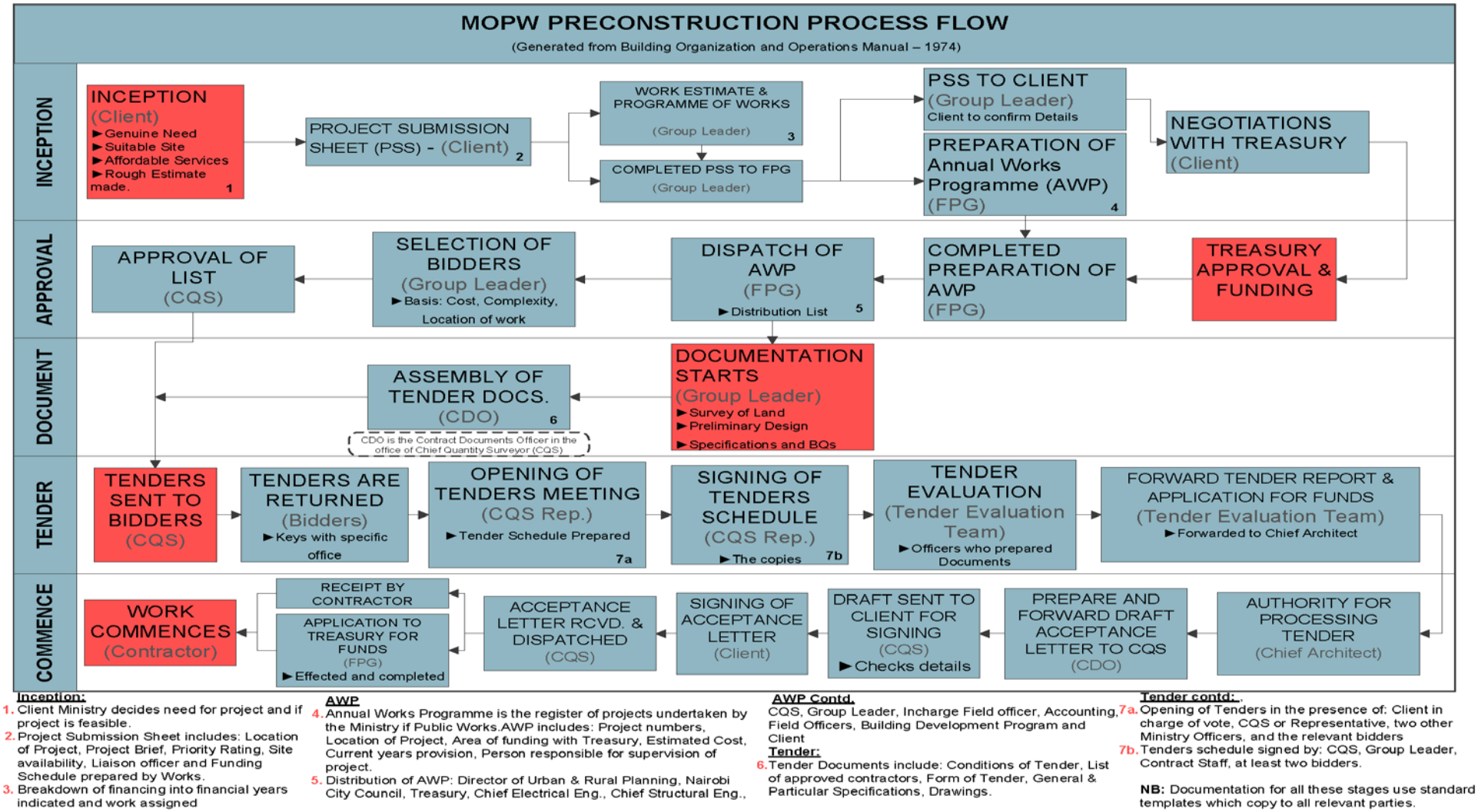

Figure 2.5 MOPW Preconstruction Process Flow

Source: BOOM, MOPW (1974)

2.15.4 MOPW ISO 9001:2008 Procedures

MOPW ISO 9001:2008 procedures provides for site topography, availability of services such as water, electricity and sewerage accessibility to site, site orientation and visual appreciation of the type of soil, vegetation and visual appreciation of size of plot/land, design and documentation, procurement, contract signing, pre contract meeting, handing over of site, mobilization and commencing of works (MOPW, 2010). This preplanning process is illustrated in figure 2.6.

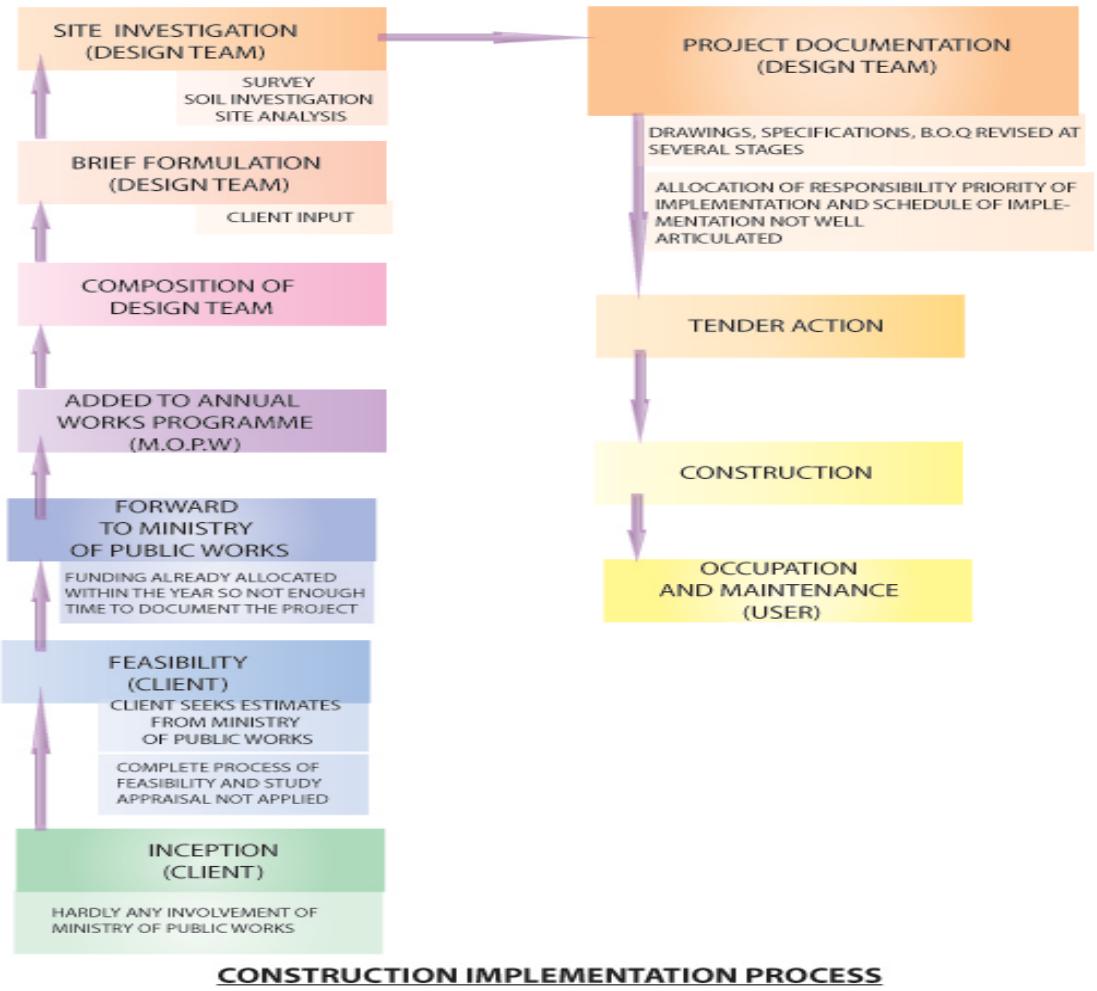

Figure 2.6 Construction Implementation Process
Source: MOPW (2010)

It is useful to note that the documents have been developed within the period of 1974 – 2010. Due to this period elapse in the development of the documents, there are contradictions in the document and there is need for review to harmonize the documentation.

2.16 Conclusion to the literature review, research gap and conceptual framework

2.16.1 Conclusion to the literature review

The construction industry involves a significant proportion of the GNP. Project planning influences social economic growth and sustainability of projects. Various scholars have had great interest in the area of project delays and have attributed project delays partly to the early stages of project implementation. Early stages of implementation require that key players be identified, respective roles be defined and all players be consultatively involved in articulating all aspects of project implementation. Researchers therefore need to develop a body of knowledge on tools, techniques and processes for successful management of construction projects. This body of knowledge for preconstruction planning in the public sector building project in Kenya should include project inception, project development, capital planning, feasibility study and appraisal, design and documentation, procurement planning tendering and mobilization.

Construction delay is also an issue of concern for public projects and has been of great interest to researchers but is still not well understood. Studies that purpose to provide better understanding of project delays would be of interest to researchers, developers, institutions which include public institutions which require built facilities to meet organization's strategic objectives. Contractors may not be interested as sometimes

they stand to benefit in the delays of the projects. There are great benefits of the research outputs to the study to further understand the effect of preconstruction planning on project timeliness as delays affect the strategic objectives of the Client causing the Client not to realise envisaged strategic plans.

2.16.2 Research gap

The preconstruction planning reviewed in this chapter covered projects in general. The researcher however notes that specific research has not identified factors at preconstruction planning that influence timeliness in project completion for public building projects in Kenya. This study therefore addresses the factors at PCP that influence timeliness in project completion**.**

2.16.3 Conceptual Framework

The study seeks to explore how the effect of various aspects in preconstruction planning which include project inception, capital planning, feasibility studies and appraisal, design and documentation, procurement plan, tendering, mobilization has in timely project completion. Variables of the projects therefore are timeliness in completion being the dependent variable while the independent variable are project inception, capital planning, feasibility studies and appraisal, design and documentation, procurement plan, tendering, mobilization as shown in figure 2.7.

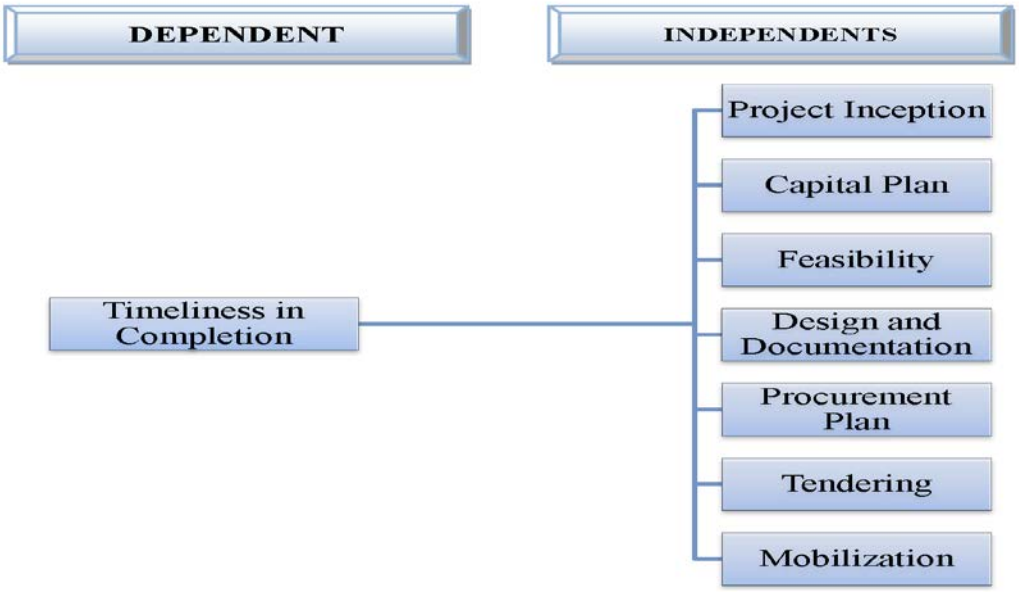

Figure 2.7 Conceptual Framework

Source: Author

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter of the study covers the methodology applied in carrying out the research thesis. The chapter is structured within the following topics; research strategy, research design, population, sample and sampling, research method, data collection, variables and finally concludes with conceptual definitions and measure of the variables.

3.2 Research Strategy

The Research Strategy for this study is qualitative. This is a research strategy that emphasizes words rather than quantification in the collection and analysis of data as observed by Bryman (2008) who further explained that theory is supposed to be derived from the data in qualitative research. This strategy was preferred since the aim of the research was to gather information from the sampled respondents through in-depth interviews. The respondents have experience as project managers and liaison officers hence posses valuable information required for this research (Bryman, 2008)

3.3 Research Design

The research is a survey of knowledge and information which the Client Ministries and the Ministry of Public Works have on preconstruction planning stage of a project and how this relates to the timely delivery of the project. Therefore the Research was designed to explore for information from Client Ministries and Ministry of Public Works. The Research Design therefore used in this study is cross- sectional design which entails collection of data on more than one case at a single point of time so as to

collect a body of data in connection with more than one variable which is then looked at to detect patterns of connection Bryman (2008). This research design compares well to what Mugenda and Mugenda (2003) refers to as causal comparative research. Exploratory case studies were undertaken to validate the information received.

3.4 Population, sample and sampling

3.4.1 Target Population

Population is defined as an entire group of individuals, events or objects having a common observable characteristic, Mugenda and Mugenda (2003). The target population for this study was public building projects in Kenya contained in the Ministry of Public Works register formally referred to as the Annual Works Programme (AWP) for the period 2006 – 2011 (MOPW, 2011). This covers the period from when the government started implementing performance contracts and project timeliness was put as a performance target in the contract. Therefore, the total population for the study consisted of 358 no. public building projects.

3.4.2 Sample and Sampling Techniques

The sampling technique employed was simple random sampling. Simple random sampling also known as chance sampling is a probability sampling technique where all units in a population have an equal chance of selection (Mugenda and Mugenda, 2003). Public building projects managed by the Ministry of Public Works Headquarters in Nairobi were picked from the register to form the sampling frame of 69 no. projects. A simple random sampling was then undertaken to select 32 no. public building projection for inclusion into the study sample. This was accomplished by first

allocating unique numbers to all the 69 no. projects in the sampling frame. The 69 no. projects were then subjected to Microsoft excel version 2010 random formula to pick 32 numbers representing the 32 no. projects. Mugenda and Mugenda (2003) indicate that a representative sampling needs to be a minimum of 30 items. The sampled projects had 10 project managers and 17 project liaison officers who were considered for interviews. Warren (2002) cited in Bryman (2008) indicates that for a qualitative research to be published, the minimum number of interviews required seems to be between twenty and thirty. Exploratory case studies were undertaken on the Sampled 32 no. randomly sampled projects for validation purposes on the interviews.

3.5 Research Method

The Research method used in this study was the Delphi Method. Skulmoski *et al* (2007) explains this method as an interactive process to collect and distill the anonymous judgement of experts using a series of data collection and analysis techniques interspersed with feedback. The Delphi Method is appropriate when the research goal is to improve understanding of problems, opportunities, solutions or to develop forecasts (Skulmoski *et al*, 2007). In this study, we need to understand how preconstruction planning affects timeliness in project completion. The Delphi method helped uncover data in the process of preconstruction planning and its effect on timely project completion.

Rowe and Write (1999) gives the four main features of the Delphi Method as a method where participants freely express respective opinions on decisions evaluated on own merit rather than who proposed the idea. Participants are allowed to refine their views as interviews progress, they are informed of other participants' views providing the

opportunity for them to clarify or change views and allows for quantitative analysis and interpretation of data.

However Skulmoski (2007) says that the Delphi method is well suited to vigorously capture qualitative data. It can be used as a structured process within which one uses qualitative and quantitative or mixed research methods with therefore the potential to answer many research questions.

Adler and Ziglio (1996) state that participants in this method need to meet expert requirements, knowledge and experience with the issues under investigation, capacity and willingness to participate with the participants, sufficient time to participate and effective communication skills. For Delphi method, what requires to be determined is the sample composition, the sample size, methodological orientation; whether qualitative or quantitative, the number of rounds for seeking the data, and the mode of interaction. The number of rounds for the interaction is 2 No. and the mode of interaction was face to face interviews. The two rounds are qualified by Skulmoski *et al* (2007) as adequate to allow for generalization.

3.6 Data Collection

3.6.1 Sources of data

Data was sourced from Client Ministry Liaison officers, Project Managers representatives in the MOPW and project records held by the MOPW for projects sampled from the MOPW projects register popularly referred to as the Annual Works Programme. Further data was sourced from text books, publications and the internet.

3.6.2 Types of Data

Primary data

Primary data was collected through face to face interviews using interview sheets taken through two rounds of interviews. First round of interview was undertaken with all the sampled respondents and the second round of interview with a simple random sampling of eight respondents from the first round of interviews.

Secondary data

This data was collected through literature review sourced from text books, publications, the internet research studies and records held at the MOPW.

3.6.3 Research Instruments

The research instruments in this study consisted of interview schedules, appendixes 5A and 5B. The schedules were prepared and refined through pilot interviews with 3 No. Project Managers and 3No. Client liaison project officers. A case study matrix, appendix 3 was also prepared and further refined with a pilot study of 3 No. Projects.

3.6.4 Methods of Data Collection

Data collection was through exploratory desk studies and semi structured Interviews. Structured interviews entails administering interview schedules with same set of questions to all the interviewees for ease of aggregating the replies thus the choice. Semi structured interviews was appropriate as there was a clear focus on the research topic (Bryman, 2008). A template of an introduction letter to the respondents appendix 1 was prepared for the purposes of making contact with the respondents from the

Ministry of Public Works, the Client Ministries, departments and Agencies. Project Managers from the Ministry of Public Works, are well known to the researcher and were therefore easy to contact. Contacts of the Client Ministry and Government Agencies Liaison officers were sought from the Project Managers and the researcher was introduced to these categories of respondents.

The Researcher made telephone contacts with all the respondents and sought appointments and had face to face interviews with them. Face to face interview with the respondents was preferred since it necessitates probing of the interviewee to obtain exhaustive information (Bryman, 2008). However, one interview was done on telephone as the respondent was not physically available. The interview period spread to eight working days. On average three interviews were undertaken per day with the interviews taking an average of one hour in the offices of respondents. Face to face interviews were undertaken with the researcher taking handwritten notes on pre-prepared templates, appendix 2B. Handwriting the notes was necessitated by the sensitivity of the respondents regarding recording. The data collected was further tested for reliability with eight respondents selected through simple random sampling from the 24 respondents. This was to confirm the accuracy of the data transcribed. Letters were written, appendix 4 to forward the transcribed data (Appendix 5) to the respondents for confirmation.

Qualitative semi structured interviews were structured to get views on aspects of preconstruction planning identified from the literature reviews. Exploratory case studies of the randomly sampled projects was also undertaken to validate the results of the interviews, a process supported by Bryman (2008) who qualifies that in qualitative

research, interviewing may be the sole method in an investigation or maybe used in tandem with another qualitative method.

3.6.5 Data validation, reliability and replicability

Regarding validation, the data collected once analysed has addressed the influence of preconstruction planning on timeliness of project completion ensuring the integrity of the conclusion generated from the research. Case studies of the randomly selected projects (Appendix 7) were used to further validate data taken from the interviews. On reliability every effort was made to minimise random error with the use of a structured interview schedule, appendix 2B, to collect data from respondents. In addition a well-articulated matrix appendix 3 was used to extract data from project records. The interview transcripts prepared from the interviews with the respondents were carefully translated into concepts around common themes (Appendix6) with care being taken to ensure consistency in the measure of concepts. On replicability, the research design and methods were well articulated so as to be replicable as the need may arise.

3.7 Variables

3.7.1 Dependent and independent Variables

The variables to the study are project inception, feasibility study and analysis, design and documentation, budgeting/finance, procurement planning tendering, mobilization and timeliness in completion. The dependent variable is timeliness in completion with the others being the independent variables.

3.7.2 Conceptual definitions and measure of the variables

Preconstruction planning is that stage of Project Planning spanning from inception of the project up to handing over of the site to the Contractor for the works to commence, Federal Transit Administration (2006). The measure of this variable is the thoroughness of application within the project implementation.

Project inception is the stage where a project is identified, discussed through the institution for acceptance and placed within the capital development of the institution. The measure of this variable is the thoroughness of application within the project implementation.

Feasibility study and analysis is the process of project feasibility study and analysis considering various aspects to determine viability of project so as to establish the best option to meet organizational objectives, Goodman (1988). The measure of this variable is the thoroughness of application within the project implementation.

Design and Documentation is a stage of the project where all inputs which include preparation of blue prints, specifications for construction facilities and equipment, operating plans and work schedules are prepared. Other aspects determined at this stage are personnel, skills and technical requirements. Environmental factors, social criteria, processes and procedures must be assessed and included at this stage, Goodman (1988). The measure of this variable is the thoroughness of application within the project implementation.

Procurement planning defines the methods of acquiring the various services in the project with the measure being thoroughness in undertaking the process.

Tendering, the tendering process is a process that leads to the identification of the Contractor to undertake the construction works. The measure of this variable is the thoroughness of application within the project implementation.

Timeliness of completion is the projected completion time as in the contract for the construction of the project. The measure of this variable is the date of completion.

CHAPTER FOUR

4.0 DATA ANALYSIS AND DISCUSSION

4.1 INTRODUCTION

This section begins by describing the data organization method employed by the researcher after field interviews were carried out with the respective respondents. The section then gives the data analysis output in form of tables and charts. The data analysis was majorly carried out in Nvivo revision 1.1 (Appendix 8) a Computer Aided Qualitative Data Analysis (CAQDAS) since the data was all qualitative. The preliminary analysis output shows the response rate followed by a display of the profession and experience of the respondents interviewed. The data analysis and discussion was carried out in a manner that answers the research questions that the study set out to investigate. The data is presented in three broad areas set out by the research questions which included finding out what the factors at the preconstruction planning stage are, to what extent is the formal preconstruction planning applied and subsequently suggesting how the current pre construction planning process can be improved in order to improve on timeliness of project completion.

4.2 Data collection, organization and response

4.2.1 Data collection and organization

Interviews with the particular respondents were undertaken and noted down in order to obtain the data to be used in answering the study questions. The handwritten notes captured during the interviews with the respondents were transcribed and formatted on an excel sheet, a sample of the transcripts is provided as appendix 5.

The transcripts developed to the excel sheets were then translated into concepts so that issues touching on same theme but differently stated in wording by the various respondents were given similar wordings for ease of analysis, Bryman (2008). Appendix 6 gives a sample of the interview concept developed from the original interview transcript.

4.2.2 Response rate

The initial part of this section gives the overall response rate followed by a breakdown of response by institution then the professions and experience of the respondents interviewed. This information is important in confirming if the method adopted by the study was actually met and to authenticate the reliability of the data collected. The population of this study consisted of public buildings' projects obtained from the Ministry of Public Works projects register. A sample of 32 projects managed from the Ministry headquarters in Nairobi were selected through simple random sampling for inclusion into the study. Interviews with the respective Project Managers from MOPW and project liaison officers from Client MDAs were undertaken to gather information required for use in this study. Follow up interviews were undertaken with 7no. randomly sampled out of respondents who had been interviewed so that they could confirm the interview transcripts. The results of the study responses are displayed in table 4.1.

Table 4.1 Tabulation of response rate

	Frequency	Response	Response rate (%)
Total No. of Projects Sampled	32	26	81.25
No. of Respondents sampled	27	24	88.89
No. of Respondents sampled to confirm	8	7	87.5
Overall response rate for the study	66	56	84.85

Source: Research data

The first category of respondents was key project personnel comprising of 10 Project Managers and 17 Client liaison officers giving a total of 27 respondents. These key project personnel were people who had been involved in implementation of the projects identified for the study. They also had extensive experience and exposure with an average of 22.5 years in public buildings project development. They were thus believed to have the requisite knowledge and experience on project implementation management right from planning, execution and completion of projects. They were expected to give information on preconstruction planning process based on their knowledge and experience. Out of the twenty seven (27) respondents, twenty four (24) were able to participate in a face to face interview thus translating to 88.89% response rate for this category of respondents.

The Delphi method adopted as the design for this study required that a series of interviews be conducted to confirm the information collected through interviews and to enhance the understanding of the problem under investigation. Thus, the study identified 8 respondents through a simple random sample from the 24 respondents interviewed in the first round. These respondents were required to confirm transcripts generated from the earlier face to face interviews with them and return the confirmed

transcripts to the researcher. 7 out of the 8 transcripts dispatched to the respective respondents were formerly confirmed giving 87.5% responses rate for this category of respondents.

An exploratory case study was carried out to confirm the findings obtained from the face to face interviews and to ascertain the validity of the data which had been obtained. Out of the 32 projects sampled, records were available for 26 projects from which relevant information was extracted. This translated to an 81.25% response rate.

On overall therefore, the response rate for this study was 84.85% which is quite significant considering the challenges encountered by the researcher in securing records for the particular projects. The information received from the field data collection is therefore accurate and representative of the study population.

4.2.3 Response by Institutions

Public projects implementation is structured in two ways; the Ministry of Public Works (MOPW) on one side provides technical expertise and the Client on the other side comprising of other government ministries, departments and agencies (MDAs). This study aimed to obtain information from the two heterogeneous sides so as to enhance data reliability. As indicated in the previous section the 27 respondents consisted of 10 Project Managers from MOPW and 17 Client liaison officers from other government MDAs. Table 4.2 gives the responses by institution.

Table 4.2 Tabulation of Response by Institutions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MOPW	11	45.8	45.8	45.8
	Client MDAs	13	54.2	54.2	100.0
	Total	24	100.0	100.0	

Source: Research data

11 responses were from the MOPW translating to 45.5% response rate while the remaining 13 responses were from Client government MDAs translating to 54.2% response on the Client side. The findings indicate that all the 10 sampled project managers and 1 administrator from MOPW participated in the face to face interviews while 13 Client liaison officers from other government MDAs participated in the face to face interviews out of the sampled 17.

4.2.4 Profession, Designation and Experience of the Respondents

The analysis of the study sought to establish the various professions, designation and years of experience of the respondents interviewed since from the sampling, it was expected that the respondents would be project managers and Client liaison officers who possess the expertise and experience preferably above five years in handling public building projects. This would improve data integrity and enhance accuracy of the information obtained from them. Tables 4.3 and 4.4 shows the representation in the study as regards the profession, designation and experience in years of the respondents interviewed by the researcher.

Table 4.3 Profession and Designation of Respondents

Profession		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Project Manager/Architect	10	41.7	41.7	41.7
	Senior Technician	1	4.2	4.2	45.8
	Administrator	5	20.8	20.8	66.7
	Educationist	1	4.2	4.2	70.8
	Engineer	2	8.3	8.3	79.2
	Police officer	1	4.2	4.2	83.3
	Trainer	1	4.2	4.2	87.5
	Health Administrator	2	8.3	8.3	95.8
	Sports Administrator	1	4.2	4.2	100.0
	Total	24	100.0	100.0	
Designation		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Ass. Director	1	4.2	4.2	4.2
	Chief Health Admin. Of	1	4.2	4.2	8.3
	D/HRM and Administration	1	4.2	4.2	12.5
	DD/Technical Education	1	4.2	4.2	16.7
	Deputy Director	1	4.2	4.2	20.8
	Deputy Secretary	2	8.3	8.3	29.2
	Director of planning	1	4.2	4.2	33.3
	Manager Construction	1	4.2	4.2	37.5
	Principal / Director	1	4.2	4.2	41.7
	Project Officer	1	4.2	4.2	45.8
	PSA/Project Manager	8	33.3	33.3	79.2
	Senior Deputy Secretary	1	4.2	4.2	83.3
	Snr. Ass. Chief Health	1	4.2	4.2	87.5
	Snr. Superintending building	1	4.2	4.2	91.7
	SPSA/Project Manager	2	8.3	8.3	100.0
	Total	24	100.0	100.0	

Source: Research data

Majority of the respondents were Architects who doubled up as project managers in the projects sampled. This was followed by administrators both in health, sports and general administrators. The remaining respondents were of various professions, a technician, an educationist, engineers, a police officer and a trainer.

The existing project implementation setup designates architects as project Managers while the rest of the professionals mainly from Client institutions are project liaison officers. Table 4.3 illustrates that ten (10) of those interviewed were Project Managers with eight (8) being Principal Superintending Architects (PSA) and two (2) being Senior Principal Superintending Architects (SPSA). The remaining respondents were Client liaison officers who are given various designations in the respective line institutions as illustrated in table 4.3.

The aforementioned response provides appropriate findings since this study was designed to obtain information from respondents with requisite expertise in project implementation management. Majority of the respondents were designated as project managers whereas the other respondents possessed senior managerial positions in their institutions thus in a position to give policy direction on project implementation. It is therefore expected that the data collected from these respondents is relevant to the study objective and reliable.

Table 4.4 Respondents' Experience in years

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3	1	4.2	4.2	4.2
	5	1	4.2	4.2	8.3
	16	1	4.2	4.2	12.5
	18	1	4.2	4.2	16.7
	20	2	8.3	8.3	25.0
	21	3	12.5	12.5	37.5
	22	1	4.2	4.2	41.7
	23	1	4.2	4.2	45.8
	24	1	4.2	4.2	50.0
	25	2	8.3	8.3	58.3
	26	3	12.5	12.5	70.8
	27	3	12.5	12.5	83.3
	28	1	4.2	4.2	87.5
	29	1	4.2	4.2	91.7
	30	2	8.3	8.3	100.0
	Total	24	100.0	100.0	

Mean 22.50

Source: Research data

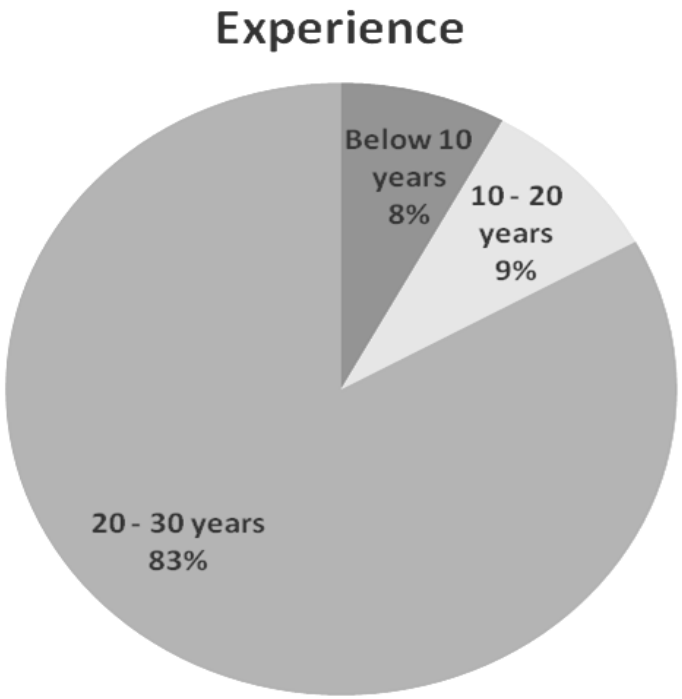

Figure 4.1 Summary of Respondents' Experience in years

Source: Research data

Respondents sampled in this study had an average of 22.5 years of experience with the least experienced respondents having 3 years of experience as illustrated in the findings presented in table 4.4 and further summarised in figure 4.1. Only one respondent had experience below 3 years these being experience specifically on road construction management. However, the respondent had many years of experience in the engineering field as a project implementer giving relevance of the respondent to the study.

The Delphi method adopted by this study according to Adler and Ziglio (1996) requires that participants meet expert requirements, knowledge and experience with the issues under investigation. This concern was adequately addressed by the study as the findings confirm that all the responses were sought from either project managers and projects liaison officers who are directly involved in public projects implementation. Also, majority of the respondents at 83% as shown in figure 4.1 had between 20 – 30 years of experience in project management, implementation and/or coordination in the public sector. The continued retention of officer in the public service in the present roles qualifies that they are knowledgeable in this field. The code of regulations for civil servants directs that an officer who does not perform diligently would be relieved of their duties (Republic of Kenya, 2006b). This improves confidence on the reliability of the information obtained from the respondents and also indicates that the research questions would accurately be answered by the study findings.

4.3 Empirical data analysis

4.3.1 Introduction

The study mainly employed qualitative strategy. Interview schedules were prepared to assist in the data collection and face to face interviews were undertaken and the responses were written down. The data analysis used in the study is the grounded theory, a form of qualitative descriptive analysis which is an approach to the generation of theory out of data Bryman (2008). Descriptive analysis which shows the direction of the relationship between project preconstruction planning and timeliness in project completion was also used. Using the grounded theory, the data collected will be used to show the influence of PCP on timeliness in project completion. Data collected from the interviews has been used in qualitative analysis in response to the Research objectives. The data was initially coded with concepts and further developed to categories (Bryman 2008).

The data has been used to propose a process flow, framework for preconstruction planning for projects in the public sector. Bryman (2008) explains that a formal theory can be generated through the use of existing theory and research in comparable settings. Descriptive analysis was conducted to find out the common knowledge and information during the preconstruction planning stage as relates to timeliness in project completion. Descriptive analysis was used with the aid of frequency tables and simple descriptive statistics such as the mean, medium and mode. The data was partly analysed with Computer Aided Qualitative Data Analysis (CAQDAS) software Nvivo, version 1.1 Bryman (2008) and description

analysis across the various interview questions in relation to the research questions and research objectives. This section displays the analysis of the data that was collected by the researcher.

This section is structured in line with the research questions of the study. Responses on questions in the interview schedule that contribute to a particular research question are grouped together for ease of conclusion on the specific question which the study investigated. The research questions sought to know what the factors at pre-construction planning stage are, to what extent formal preconstruction planning is applied and further suggesting how the current pre-construction planning process can be improved in order to improve on project timeliness.

4.3.2 What are the factors at preconstruction planning?

Finding a solution to a problem requires first admitting its existence and then getting an understanding of the background of the particular problem and issues around it. This section highlights the findings on the factors at preconstruction planning.

4.3.2.1 Preconstruction Planning Process

Preconstruction planning process comprises a sequence of activities undertaken before the actual construction of project starts. It gives the order of activities within the initial phase of project implementation. Respondents were asked to describe the process of preconstruction planning for the projects they were undertaking. The results of the study contained in table 4.5 and figure 4.2 illustrate the components in preconstruction planning process as mentioned by the respondents.

Table 4.5 Preconstruction Planning Process

Concept	Frequency	Percentage
Client Need Identification	17	70.8
Client Internal Consultations	3	12.5
Brief formulation	19	79.2
Stakeholder involvement	5	20.8
Client Need Submission	15	62.5
Project manager appointment	2	8.3
Design team constitution	13	54.2
Design team/Client Consultation	17	70.8
Preconstruction meeting	3	12.5
Process Project submission sheet (PSS)	3	12.5
Brief confirmation	2	8.3
Confirm Site availability	5	20.8
Feasibility study	8	33.3
Works Program preparation	4	16.7
Procurement plan	8	33.3
Design and Documentation	2	8.3
• Preliminary designs	13	54.2
• Client's approval of preliminary estimates & design.	22	91.7
Seek funds (confirm funds will be availed at concept stage)	13	54.2
Site survey and investigation	13	54.2
• Detailed design	21	87.5
• Estimates preparation	13	54.2
• Design/Estimates approvals	21	87.5
• Financier's approval	1	4.2
• Statutory approval	1	4.2
• MOPW HODs approval	3	12.5
• BOQs preparations	9	37.5
Site handover	13	54.2
Procurement		
• Contract signing	4	16.7
• Tender documents preparation	4	16.7
• Tendering	23	95.8
Contractor Mobilize & works commence	7	29.2
Confirm funds (actual funds availability to allow award)	13	54.2

Source: Research data

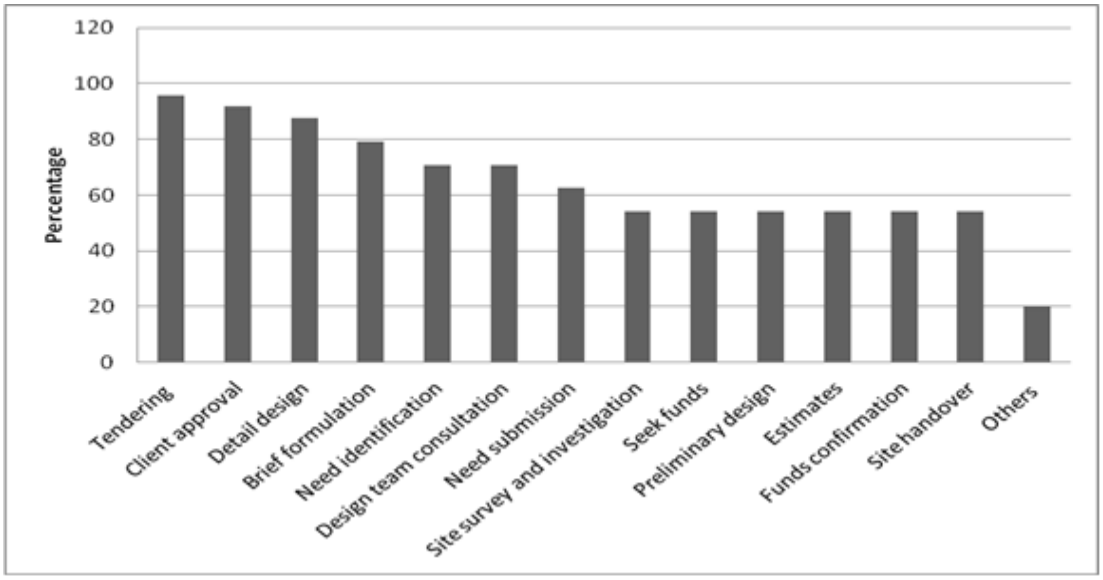

Figure 4.2 Preconstruction Planning Process

Source: Research data

The leading issues mentioned by the respondents during the interviews were procurement of contractor through tendering process as per the regulation, client's approval of preliminary estimates and designs, preparation of detail designs, brief formulation, design team/client consultation, need identification and submission by the client. Other factors were preparation of preliminary designs, estimates preparation, design team constitution, site survey and investigation, seeking of funds from treasury and subsequent confirmation of funds and site handover.

The responses provided an outline of activities undertaken at preconstruction planning. This question had sought to obtain a description of the process of preconstruction planning for the projects the respondents were undertaking. The findings attempt to describe the PCP process beginning with need identification and submission and ending with contract signing and site handing over. These findings form part of the factors at preconstruction planning which the first research question had sought to identify. Some

of these factors within the PCP process are addressed in detail by subsequent interview questions. The factors could be effectively undertaken to improve on timeliness in project completion. Therefore, they are considered as influencing or control variables in this study and would be utilized in developing the PCP framework.

To ascertain these interview findings, the researcher undertook an exploratory case study on sampled projects. This involved a desktop review of the project records to extract relevant information as regards preconstruction planning. The findings were tabulated and are presented in table 4.6.

Table 4.6 Exploratory Case study results on issues addressed in preconstruction planning

Issue	Frequency	Percentage (%)
Pre contract meeting & site handover	5	20.0
Communication Channels	1	3.8
Design team composition	2	7.7
Project management team composition	2	7.7
Acknowledge tender by Contractor	1	3.8
Development of Works programme	2	7.7
Performance/insurance bond issuance	1	3.8
Contract data	1	3.8
Develop unprized Bills of Quantities	1	3.8
Scope/Brief formulation	15	57.7
Financial analysis	11	42.3
Site survey	11	42.3
Client's brief	7	26.9
Develop Drawings	9	34.6
Feasibility study	2	7.7
Need assessment	2	7.7
Design and documentation	6	23.1
Tendering	2	7.7
Assigning roles and responsibilities to parties	2	7.7

Source: Research data

Each issue listed above was identified in at least one project document. Brief formulation was the most highlighted issue followed by financial analysis and site

survey. Other issues significantly highlighted in the project records were, development of drawings, adherence to Client's brief, design and documentation, pre-contract meeting and site hand-over. The findings from the exploratory case study identified are similar to those mentioned by the respondents.

However, the aspects were fewer and their frequencies were not comparable to those from the interviews since this exploratory case study depended substantially on the records available. These records had no standard format of keeping implying individual officers had varied ways of keeping the records and placed emphasis on different aspects. Nevertheless, these findings together with those from the respondents highlight factors at preconstruction planning and further bring out a process for preconstruction planning with which the factors are intertwined. The leading factors identified were need identification and submission, brief formulation, site investigation and survey, seeking for funds, design and documentation, Client approval, funds confirmation, tendering and site handing over. All the factors identified constitute the entire process of preconstruction planning.

4.3.2.2 Feasibility Study and Appraisal Aspects

Feasibility study is a factor at preconstruction planning. This is the stage where the viability of a project is determined against various aspects. It is considered a critical factor that determines whether to continue with a project or pursue another alternative which is comparably cost effective and gives value for money. This study sought to know the aspects considered in feasibility study and to establish if they have influence on project delivery. It also sought to know whether a clear responsibility exist on who should undertake feasibility study.

Feasibility study has specific aspects that are looked into during the study and appraisal of a project. These aspects are considered in order to get detailed information on the benefits that are expected to accrue from the project implementation as well as the costs which might arise as a result of undertaking the project. The findings of this study found out a number of these aspects as displayed in figure 4.3.

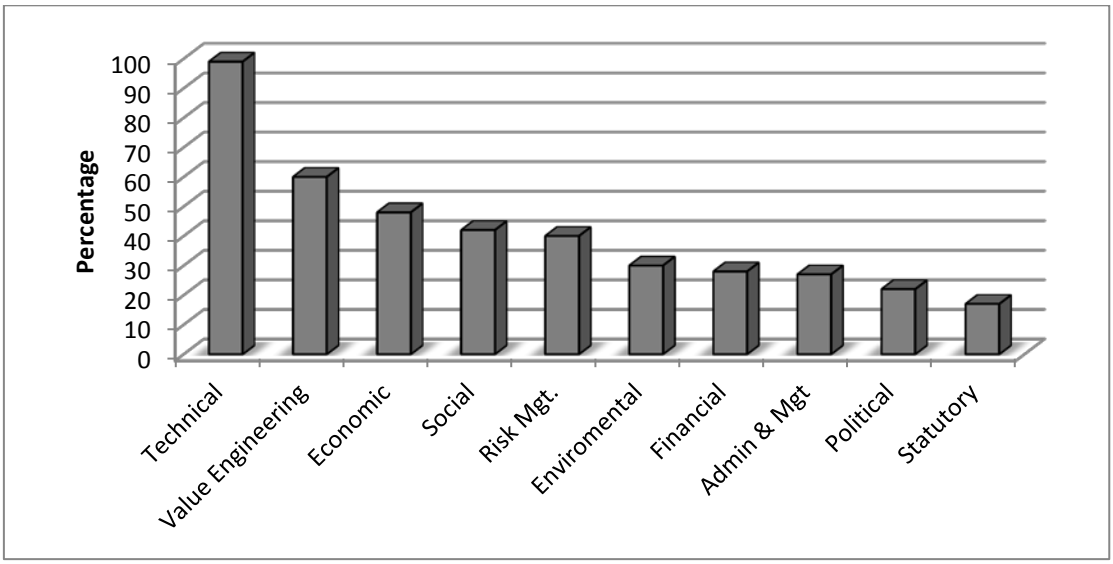

Figure 4.3 Feasibility study and appraisal aspects

Source: Research data

Technical aspect in the feasibility study recorded the highest mention by the respondents followed by value engineering, economic aspect, social aspect, risk management, financial component, environmental, administration and management, political aspect and finally statutory aspect. This translated to a total number of ten aspects mentioned by the respondents. The findings illustrate that of all the aspects in feasibility study, technical aspect and value engineering had a higher mention over others. Feasibility study and appraisal constitute one of the factors in preconstruction planning as had been indicated in the preconstruction planning process findings though only at 33.3 % response rate as a process of preconstruction planning.

4.3.2.3 Who undertakes feasibility study?

Assigning responsibility makes it easier to identify the point of efficiency. This study sought to find out who is responsible for undertaking feasibility study and appraisal during the preconstruction planning process. Since feasibility study and appraisal is an important factor considered in preconstruction, it should have influence on the efficiency and effectiveness of the PCP process. It is therefore necessary to establish if the entity to carryout feasibility study and appraisal is clearly defined and understood by the respondents as shown in table 4.8 and figure 4.4.

Table 4.7 Who undertakes feasibility study and appraisal for projects?

	Client	Client and MOPW design team	MOPW design team	Consultants	Donor on behalf of Client	Financier	Feasibility not Undertaken
Frequency	10	6	4	3	2	1	2
Percentage	41.7	25.0	16.7	12.5	8.3	4.2	8.3

Source: Research data

Feasibility study and appraisal as per the study results shown in table 4.7 and figure 4.4 above is undertaken mostly by the Client. The findings also indicate that feasibility study is sometimes undertaken jointly by the Client and MOPW design team or MOPW design team alone. In addition, the respondents stated that the Client in some cases hire consultants to undertake feasibility study on their behalf. On the other hand some of the respondents mentioned that the donor could undertake feasibility study on behalf of Client equal to those who were of the opinion that feasibility study is never undertaken. Additionally, other respondents said that the financier of the project could undertake the study.

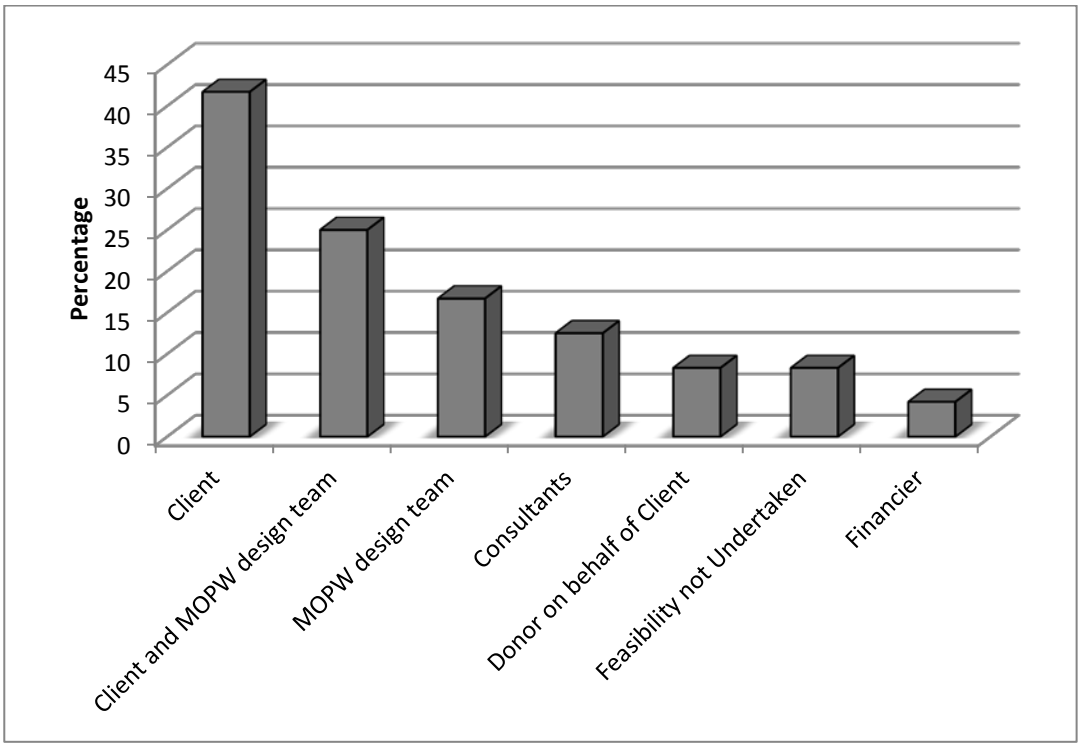

Figure 4.4 Who undertakes feasibility study?

Source: Research data

The findings of the study strongly point out that feasibility study should be a responsibility of the Client with others suggesting that it should be a shared responsibility between the Client and the design team. These findings are important in helping to allocate responsibility when coming up with a framework for PCP.

4.3.2.4 Design and documentation Stage

Design and documentation is another factor at PCP. It follows after a project has been determined feasible in all aspects. This stage is where a project is visualized and all related specifications noted to aid in implementation. At this stage tender documents are prepared after which the project moves to the tendering stage. When design is effectively executed, project implementation is expected to be successful.

This study sought to identify documents at the design and documentation and to investigate to what extent they influence PCP. During the design and documentation, a number of output documents are expected that are to guide the implementation of a project. These documents are also expected to be points of reference for the project actors during construction. This stage is thus important since processes on the construction of a project is documented and the designs for the building project also prepared. The respondents interviewed in this study were expected to mention the documents that are expected to be prepared during the design and documentation stage. The table 4.8 gives the study findings.

Table 4.8 Documentation at Design and Documentation Stage

Concept	Frequency	Percentage
Brief	4	16.7
Designs		
• Generic designs	1	4.2
• Preliminary designs	14	58.3
• Working drawings	8	33.3
• Model	1	4.2
• Scheme designs	9	37.5
• Drawings	22	91.7
Bills of Quantities (BOQs)	21	87.5
Estimates	9	37.5
Site plan	2	8.3
Works programme	5	20.8
Specifications	8	33.3
Concept papers	4	16.7
Tender documents	11	45.8
Legal documents	3	12.5
Reports	4	16.7
• Feasibility report	4	16.7
• M&E report	2	8.3
• Site analysis report	8	33.3
• EIA report	3	12.5

Source: Research data

The most highly mentioned documents by the respondents were designs/drawings which are a translation of a client's request to illustrations that allow construction and bills of quantities. Bills of quantities are detailed write ups to allow tendering. The other documents considerably mentioned by the respondents were preliminary designs, tender documents (detailed documents prepared for use in bidding) scheme drawings and estimates (an indication of project cost before tender), specifications(detailed explanation of each building element), working drawings and site analysis report (report on status of the building site before construction). The least mentioned documents were generic designs and model**.** The data shows that drawings and BOQS were the most mentioned to documents. On overall, design and documentation define the nature of a project as a crucial aspect of PCP.

4.3.2.5 Preconstruction planning institutional structure

The institutional structure at the preconstruction planning gives the specific actors who are responsible for undertaking the specific tasks identified in section 4.3.2.1. These institutions and entities need to be clearly defined and specific tasks allocated to ensure a smooth flow of the preconstruction process. This study sought to find out the main entities that are involved in the preconstruction process. Respondents were asked to mention these entities and their specific input in the pre-construction process. The results are displayed in table 4.9.

Table 4.9 Preconstruction planning institutional structure

Concept	Frequency	Percentage
Procurement/Tendering Committee	23	95.8
Client/User (Project mgt committee)		
• Project confirmation	3	12.5
• Project need submission	10	41.7
• Project identification	11	45.8

• Design/documentation approval	2	8.3
• Liaise with MOPW	2	8.3
• Project implementation	2	8.3
• Brief formulation • Seeking funds	8	33.3
MOPW approvals	14	58.3
Client PS/Policy level	18	75.0
• Funding approval	8	33.3
• Funds Confirmation	10	41.7
• Project approval	7	29.2
• Contract signing	24	100.0
Treasury	14	58.3
Project Liaison officer	17	70.8
Project Manager	9	37.5
Project Design team	23	95.8
• Site visit by design team	1	4.2
• Preliminary designs prepared	2	8.3
MOPW Technical structure	5	20.8
Contractor • Contract Signing	18	75.0

Source: Research data

Seven entities were mentioned by the respondents as being crucial in project preconstruction planning as shown in table 4.9. The entities that received the highest mention by the respondents were Client PS on contract signing, the design team and procurement/tendering committee. MOPW got a mention in two different aspects as an approving body through its existing technical structure. These were followed by the Client PS/policy level and project liaison officer. Project manager was the least mentioned in this category The Client/User project management committee got mention through the activities it undertakes within the preconstruction planning process. The most prominent activity for this committee according to the respondents was project identification and submission. The key entities identified by the findings would be a critical component in the PCP framework that the study aims to come up with to guide the preconstruction planning process for public buildings projects. Specific

responsibilities would thus be assigned to each entity to avoid confusion that might impact negatively on project completion time.

4.3.2.6 Summary to the research question, 'what are the factors at preconstruction planning?'

To conclude this research question which sought to identify factors at the preconstruction planning stage, the findings established that these factors were intertwined with the PCP process and were contained in the various phases of PCP process. The process begins with project inception. Under this, need identification and submission, brief formulation and seeking project funding were identified as the leading factors. The second phase identified was the feasibility study and appraisal. Here the findings identified ten aspects namely value engineering, technical, economic, administrative and management, financial, environmental, social, political, statutory and risk management as the key factors. Carrying out of these aspects was established to be majorly the responsibility of the Client with MOPW assisting in the technical aspect. The next set of factors was at the third phase of the PCP process which was established to be design and documentation. Drawings from across professions and BOQs established as the commonly referred to documentation were the key factors at this phase. To conclude this research question, the findings identified eleven entities which form part of the PCP framework along with the factors identified.

4.3.3 To what Extent is formal preconstruction planning applied?

This study sought to get opinion of the respondents on application of formal preconstruction planning. One of the intentions of the study was to explore the extent to

which preconstruction process is applied, to establish whether efficient preconstruction planning improves project timeliness and to further ascertain if indeed preconstruction planning have an influence on projected completion time of projects. The answers to these questions will help clarify the main objective of the study which was to explore the influence of preconstruction planning on project timeliness.

4.3.3.1 Extent of the application of preconstruction Planning

To partly accomplish one of the objectives of this study, it was necessary to explore the extent to which preconstruction planning is currently applied in projects development in the public sector. Respondents were asked to within own knowledge and experience the extent to which preconstruction planning is applied in the process of project implementation specifically in the public building projects. The responses were then tabulated and are displayed in figure 4.5.

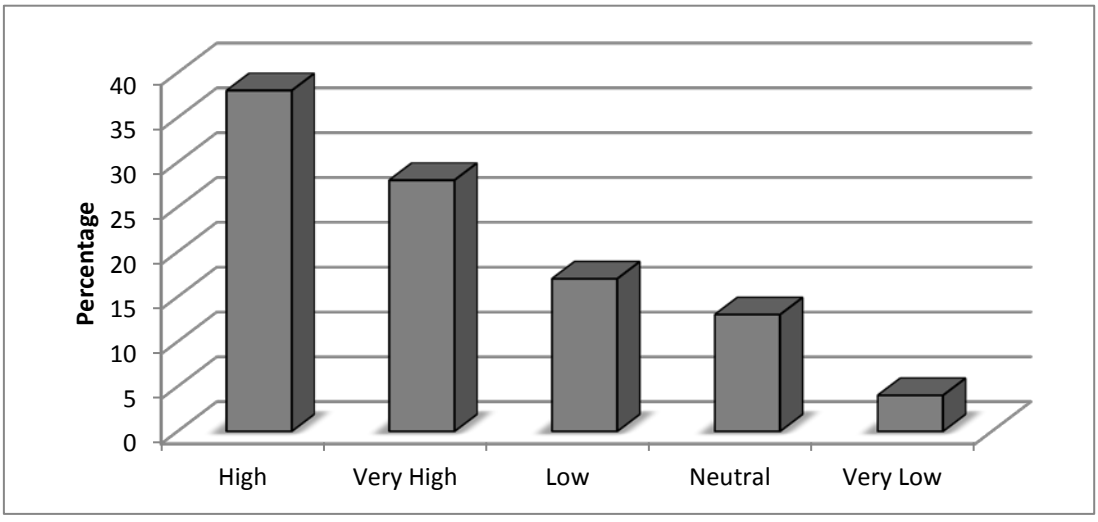

Figure 4.5. Extent of application of preconstruction planning
Source: Research data

The overall indication by the respondents is that the extent of application of

preconstruction planning is high. This triggers a question on whether preconstruction planning application in its current form is exhaustive and efficient.

Therefore, it is necessary to interrogate the preconstruction process and look into ways of making it fulfil its goal of improving project timeliness since the findings above give an assurance that if the process is articulated with a clear framework, its application would to a great extent be guaranteed.

4.3.3.2 Efficient preconstruction planning and improvement on project timeliness

This question was posed to the respondents to get express opinion on the main objective of this study which was to establish whether preconstruction planning improves project timeliness. The findings on this question would assist to establish the existence of a causal relationship between preconstruction planning and project timeliness. Table 4.10 displays the responses as obtained from the respondents interviewed.

Table 4.10 Efficient preconstruction planning improves timeliness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	7	29.2	29.2	29.2
	Highly agree	17	70.8	70.8	100.0
	Total	24	100.0	100.0	

Source: Research data

Only two categories of response were realized on the question. A majority of the respondents highly agreed with the fact that efficient preconstruction planning improves project timeliness while the remaining plainly agreed. Therefore, none of the respondents disagreed with the statement. These findings confirm the main objective of

the study thereby suggesting that improved project timeliness could be realized by enhancing efficiency in the preconstruction planning process.

4.3.3.3 Effect of preconstruction planning on project timeliness.

The respondents' opinion was further sought on the effect that preconstruction planning has on project timeliness. Here the respondent were expected to state whether preconstruction planning greatly affects, somewhat affects, affects, neutral or does not affect timely project delivery. The findings as per the responses are displayed below in table 4.11.

Table 4.11 Effect of Preconstruction Planning on timely completion of Projects

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	4	16.7	16.7	16.7
	Affects	8	33.3	33.3	50.0
	Greatly Affects	12	50.0	50.0	100.0
	Total	24	100.0	100.0	

Source: Research data

Most of the respondents indicated that preconstruction planning affects timely project delivery with 50% of them indicating that it greatly affects timely project delivery. However, some of the respondents were not sure whether preconstruction planning does or does not affect timely delivery of project. They thus remained neutral. The results as displayed in table 4.11 give an indication that preconstruction planning has a bearing on timely delivery of projects as majority of the respondents said that PCP affects timely project delivery. This affirms the objective of this study and confirms the need to streamline the PCP process so as to improve on project timeliness.

4.3.3.4 Summary to research question, 'to what Extent is formal Preconstruction Planning Applied?'

To conclude this research question whose aim was to establish the extent formal preconstruction planning is applied. The researcher therefore incorporated specific questions in order to obtain information from the respondents. The first interview question which was to explore the extent to which preconstruction planning was being applied established a main finding that the extent of PCP application was high. In addition respondents were asked to give their opinion on whether efficient PCP improves timely project delivery. Majority of the respondents at 70.8% highly agreed that efficient PCP would enhance projects timely delivery completion affirming the need to make the process efficient. The final question was to find out if PCP had an effect on projected completion time for projects. Here majority at 50% agreed that PCP greatly affects projected project completion time. This directly guides the main study objective. In conclusion the findings established that PCP positively affects timely project delivery and that the extent of its application was high.

4.3.4 How can the current Preconstruction Planning Process be improved?

The aforementioned sections answered questions on factors at preconstruction planning stage and defined the extent of formal preconstruction planning and the influence of PCP on project timeliness. This section would look into ways of improving the existing preconstruction process. To accomplish this objective, a situational analysis was carried out through exploratory case studies on a sample of public building projects to get an understanding and identify causes of delays in project delivery. Finally, a way out was

sought by obtaining suggestions from the respondents on how to mitigate on the factors that cause delays on project delivery.

4.3.4.1 Situational Analysis on Current Project completion

This study sought to establish completion timeliness in the implementation of building projects through undertaking exploratory case study on the sampled projects. The study examined the completion rate of these projects and timeliness in the completion. The study further sought views of the respondents on the factors that hinder timely project completion. The findings of the study derived from the case studies are as illustrated in table 4.12 and figures 4.6 and 4.7.

Table 4.12 Statistics on completion rate and time elapsed on projects completion

		Percentage time elapsed on project completion	Percentage completion of projects
N	Valid	25	26
	Missing	1	0
Mean		209.80	87.54
Median		157.00	100.00
Mode		117	100
Std. Deviation		128.298	19.416
Variance		16460.333	376.978
Skewness		1.236	-1.757
Std. Error of Skewness		.464	.456
Kurtosis		-.034	2.561
Std. Error of Kurtosis		.902	.887
Minimum		91	31
Maximum		481	100
Sum		5245	2276

Source: Research data

Projects sampled for study had exceeded projected completion time by a mean of 209.8% and were at an average of 87.54% of completion. The project that had the minimum percentage time elapsed was at 91% whereas that which had the maximum

time elapsed was at 481%. On the other hand, one project was as low as 31% complete yet it was beyond its projected completion time. Most of the projects had surpassed their completion time by 117% and majority were 100% complete.

However, a huge variation (16460) was witnessed on the part of percentage time elapsed as some projects took too long before completion and others took a short time though none was complete within the projected time. Percentage time elapsed displayed a positive skew about the mean. This implies more cases were below the mean while that of percentage completion of projects was negatively skewed meaning more values were above the mean.

From these results it is clear that a problem exist on projects timeliness as majority of public building projects are not completed within projected time. As had been established by the earlier findings, project timeline is often set during planning stages of project development. Therefore, the findings of this section are a pointer to an inherent inefficiency in the current preconstruction planning process.

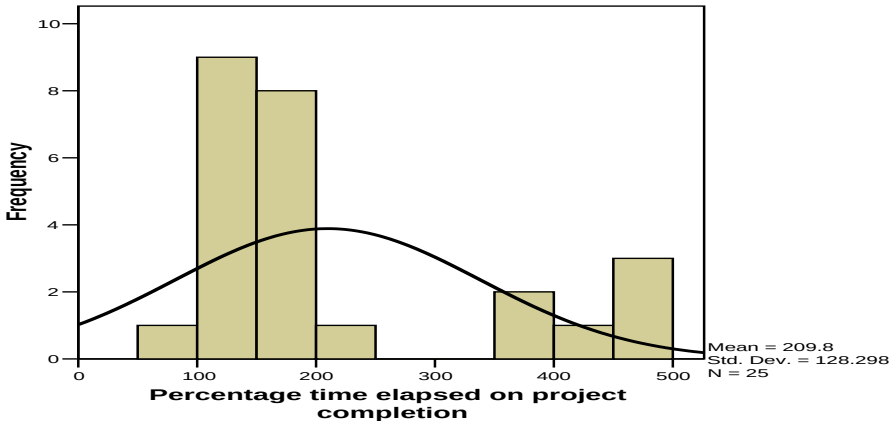

Figure 4.6 Normal curve on percentage time elapsed

Source: Research data

Majority of project time elapsed fell between an interval of 100% and 200%. The normal curve superimposed on the histogram in figure 4.8 shows skewness in distribution tending to the right meaning the distribution is positively skewed. This suggests that percentage time elapsed on most projects was above 100% up to 200% though a few were above the mean percentage which was 209.8%. This confirms that most public building projects were never completed on the projected date. A project is considered completed in time when its percentage completion is at 100% with a 100% time elapsed. Project contract period is determined at the preconstruction planning stage. The findings therefore confirm the inadequacy in the preconstruction planning process which this study sought to address by formulating with a PCP framework informed by the study findings.

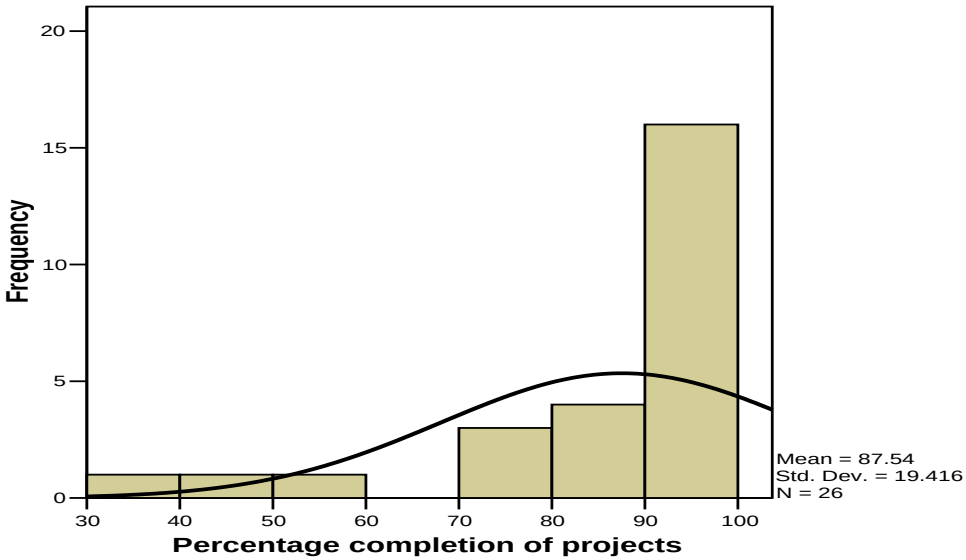

Figure 4.7 Normal curve on percentage completion of projects

Source: Research data

Most of the projects sampled for the exploratory case study were between 90% and 100% complete. The normal curve superimposed on the histogram shows a distribution in percentage completion which is negatively skewed. This implies that most of the

projects analysed were above 90% complete against a mean of 87.54% even though all of them were beyond their projected completion date. This finding further affirms the study problem and illustrate at completion majority of projects would have doubled their projected completion time period.

4.3.4.2 What are the causes of delays in Project Completion?

The previous section had established that significant delays exist in project completion and that most projects are completed after project completion time has passed. It is worth investigating the exact causes of these delays and at what stage of implementation they manifest. This allows design of appropriate mitigation measures that are precise and achieve the greatest intended results. The study had hypothesised that these delays partly exist at the preconstruction planning stage and that mitigation measures should thus focus on enhancing the efficiency at preconstruction planning stage so as to improve on project timeliness. The findings displayed hereafter, first start by highlighting causes of projects delays as shown in figure 4.8, then suggesting mitigation measures and finally giving general opinion of respondents on how to improve the overall preconstruction planning process.

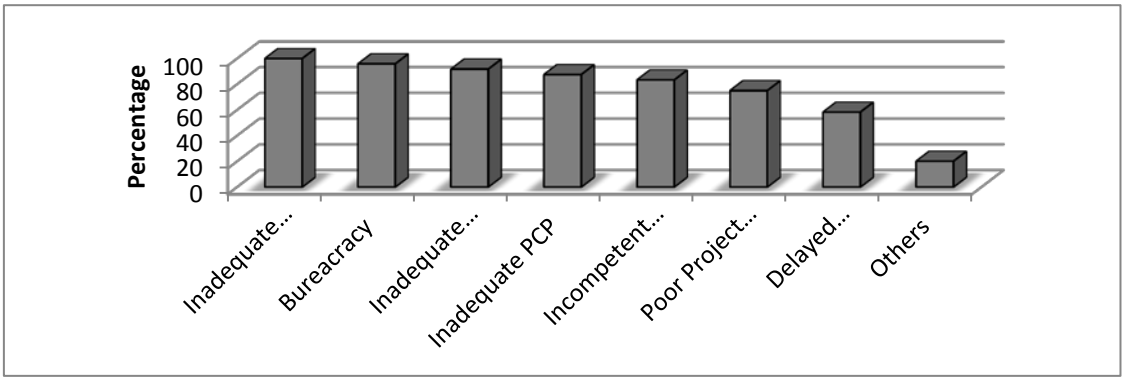

Figure 4.8 Causes of delays in project completion

Source: Research data

All respondents mentioned inadequate personnel as a major hindrance to timely projects completion. This was followed closely by mention of long decision making process as a factor causing delay in project completion. Also mentioned by a majority of the respondents were inadequate/late release of funds for project implementation, incompetent Contractors, inadequate preconstruction planning, poor project management and delayed payment to the Contractor. These factors could adequately be addressed at the PCP stage of project implementation so as to alleviate them before they affect timeliness in project completion.

Table 4.13 Findings from exploratory case study on Causes of delays in project completion

Cause	Frequency	Percentage (%)
Delayed payment	15	57.7
Non-performance by Contractor	11	42.3
Delayed appointment of subcontractor	10	38.5
Increased scope	7	26.9
Delay in issuance of contract data	5	19.2
Force Majeure	3	11.5
Variations	2	7.7
Site constraints	2	7.7
Client interference	1	3.8
Site hand over delays	1	3.8

Source: Research data

Delayed payment was the leading cause of project delay according to the findings from the exploratory case study analysis undertaken by the researcher. This was followed by Non-performance by the Contractor, delayed appointment of sub-contractor, increased scope of works amongst others causes as in table 4.13. These findings confirm those

highlighted by the respondents. The causes compare well with those identified by the respondents even though the percentages are different. Causes given by respondents included, inadequate personnel, bureaucracy, inadequate funds, inadequate PCP, incompetent contractors, poor project management, delayed payments. This therefore gives validity to the findings from the respondents.

4.3.4.3 What causes inadequate design and documentation?

Design and documentation is a major phase in preconstruction planning process. It is the phase where all project data is collected and documentation developed including works programme, financial, layout, tender documents and activity schedules. Therefore, any inadequacy at this phase will affect the overall success in implementation of a project. Project execution team will rely heavily on the output of design and documentation as will be shown later by the findings of projects case study analysis. Inadequacy in design and documentation has causal factors which can be mitigated. The findings displayed in figure 4.9 highlight the major causes of design and documentation inadequacy as were mentioned by the respondents.

Inconclusive feasibility study is the mentioned cause of inadequate design and documentation followed closely by inadequate personnel and unclear brief as other main causal factors. The respondents further mentioned other influencing factors on inadequate design and documentation as being inadequate resources, lack of commitment, inexperienced personnel, inadequate time for design and documentation, undisciplined officers, and lack of synergy among the project team. The remaining factors received an average mention at 27.5%.

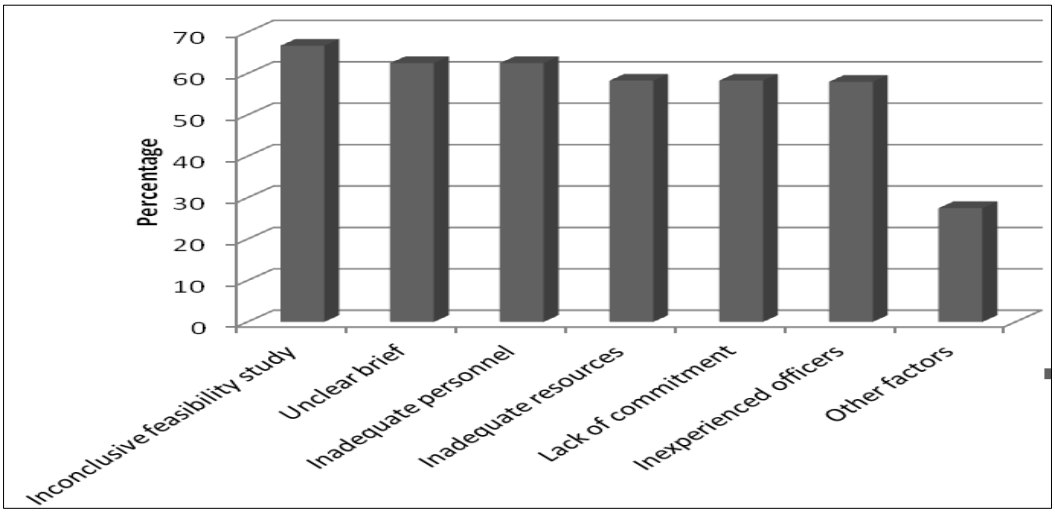

Figure 4.9 Causes of Inadequate design and documentation

Source: Research data

The findings identified inconclusive feasibility study, inadequate personnel, unclear brief, inadequate resources, lack of commitment, inexperienced officers and inadequate time as the leading causes of inadequate design and documentation. These causes of delays highlight the weak point in the preconstruction planning process which would assist in developing ways to improve the PCP process by developing an effective framework for it.

4.3.4.4 Effects of inadequate design and documentation

Inadequate design and documentation would have resultant effects on building projects that the study sought to investigate. These effects would act as symptoms within the overall preconstruction process that would help design appropriate framework to addressed management of PCP process in order to achieve desired results that would improve project timeliness. Figure 4.10 displays the effects as obtained from the respondents.

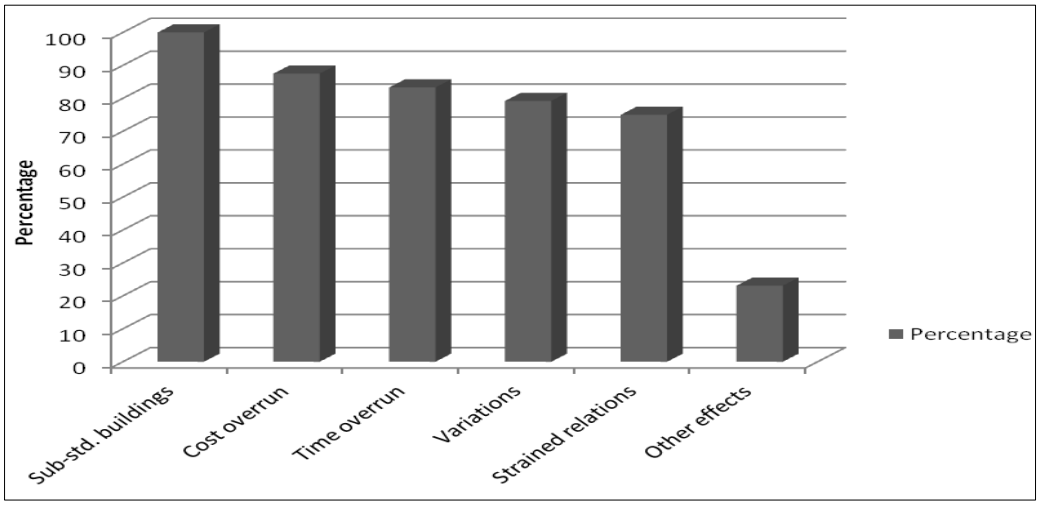

Figure 4.10 Effect of inadequate design and documentation

Source: Research data

When design and documentation is inadequate, the resultant effect will majorly be sub-standard buildings which are buildings constructed with poor workmanship or materials or both. Also more likely to result are cost overrun, time overrun, variations and strained relation between the client and the project management team. The other resultant effects mentioned were, inadequate consultations, stalled buildings, corruption, lack of innovation, inadequate records, erroneous funding projection, unreliable contract sum, dissatisfied client and stakeholders, negative perception on project team, no value for money and project programme change.

The findings established that substandard buildings, cost overrun, time overrun, variations and strained relations would result from inadequate design and documentation. The preconstruction planning process includes design and documentation therefore; the resultant effects arising from the inadequacy in design and documentation generally imply that same effects would result from inefficiency in the PCP process. These findings outline the effects including time overrun that would be

avoided by developing a framework to enhance the efficiency of the current PCP process.

4.3.4.5 Mitigation measures on project completion delays

Mitigation measures are required so as to enhance efficiency in project implementation and eventually improve project timeliness in completion. One of the aims of this study was to suggest ways of improving the current preconstruction planning process and to develop a framework to guide the process. To fulfil the aforementioned aim, a question was included within the interview schedule asking the respondents to suggest mitigation measures to address delays in project timeliness in completion. The measures as put across by the respondents were tabulated and are displayed in figure 4.11.

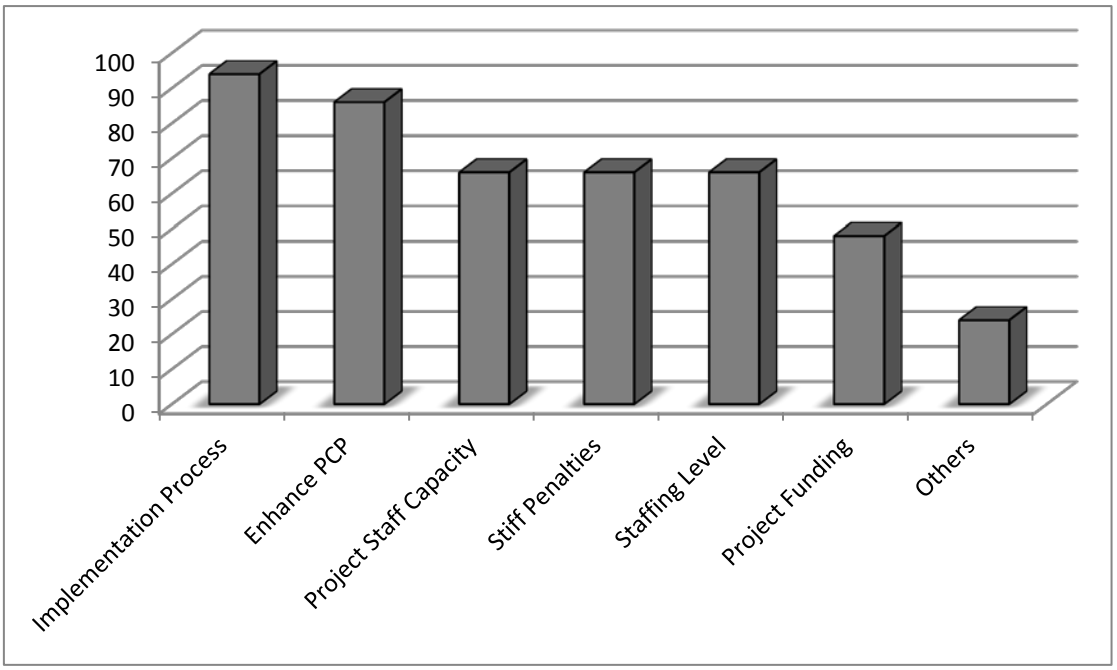

Figure 4.11 Mitigation measures on project completion delays

Source: Research data

A majority of the respondents supported a review of project implementation process with others suggesting that preconstruction planning process should be carried out in order to solve the problem of project completion delays. Also mentioned by respondents was enhancement of capacity of project staff in terms of training, instilling of stiff penalties on actors for non-compliance and adhering to statutory obligations. The respondents further suggested that project funding should be looked at so as to ensure that adequate financial resources are availed for timely project completion.

The results of the study therefore identified important mitigation measures including review of project implementation process, enhancement of the PCP process, boosting capacity of project implementation staff, instituting stiff penalties on those who do not comply with set procedures and reviewing the staffing level and structure for project implementation. Preconstruction planning as a recommendation to mitigate on the delays in project completion reiterates the main aim of this study.

4.3.4.6 General opinion on improving project timeliness

Respondents were asked to give individual opinion on how the overall timely completion of projects could be achieved. These responses would input into ways of improving the current preconstruction planning process. Table 4.14 and figure 4.12 shows the responses as mentioned by the respondents.

Table 4.14. General opinion on improving project timeliness

Concept	Frequency	Percent
Institutionalize PCP	24	100.0
Embrace Research & Development	18	75.0
Prompt Funding/payment	10	41.7
Review procurement process	8	33.3
Fight corruption	6	25.0
Detailed works programme	6	25.0
Reform Project implementation structures	5	20.8
Induction for new staff	5	20.8
Empower Project Manager	4	16.7
Embrace M&E	4	16.7
Understand Ministry mandate	3	12.5
Involvement of Contractor	2	8.3
Value addition on project implementation	2	8.3
Stakeholders involvement	2	8.3
Recruit more staff	2	8.3
Eliminate delay factors	2	8.3
Review of Std form of tender	1	4.2
Reintroduce former clause 2	1	4.2
Leadership patriotism	1	4.2
Forge Synergy among technical staff	1	4.2
Contract period determination	1	4.2
Project prioritization	1	4.2
Embrace IT	1	4.2
Adhere to Statutory obligations	1	4.2

Source: Research data

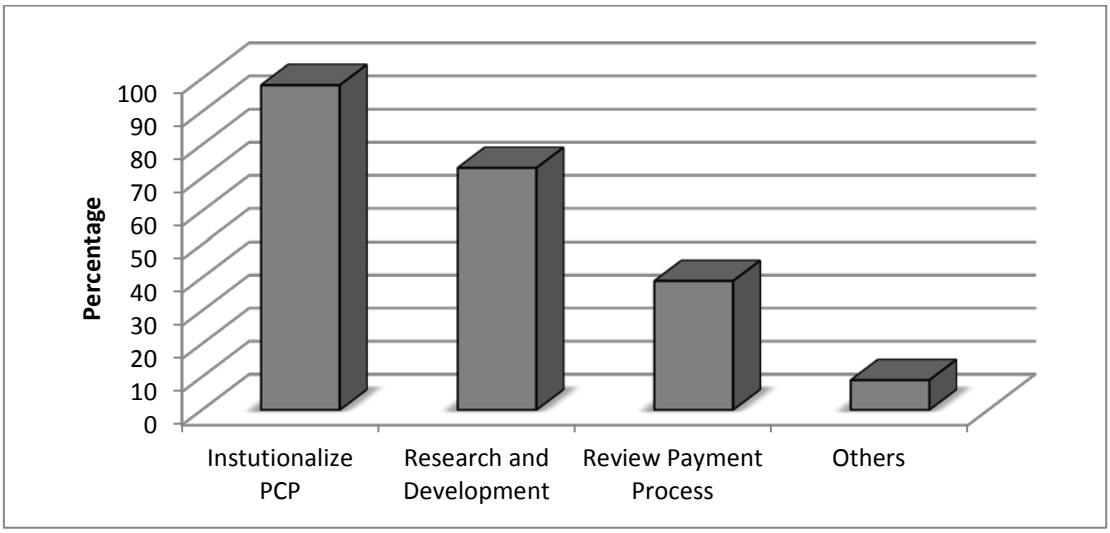

Figure 4.12 General opinion on improving project timeliness

Source: Research data

A resounding response was witnessed on institutionalization of preconstruction planning where all the respondents interviewed suggested this as being necessary to improve on timely completion of projects. Other respondents mentioned that research and development should be embraced. Respondents also mentioned that payments and funding should be undertaken promptly so as to allow for smooth and timely completion of projects. The issues mentioned compare well with the mitigation measures mentioned earlier in this chapter as both questions are investigating ways of improving on timelines of project completion.

These findings support the final objective of this study to recommend an institutional framework for preconstruction planning for public buildings projects. The overwhelming response of 100% suggests that PCP if institutionalized and efficiently undertaken would immensely improve delivery of projects.

4.3.4.7 Summary to research question, 'how can the current Preconstruction Planning Process be improved?'

To conclude this research question which was to look at how the current preconstruction process could be improved, it would be necessary to point out that the key findings identified were that majority of public building projects were not completed within the projected contract period. It was established that at completion majority of projects had doubled their projected time period. The study identified the preconstruction planning as amongst the leading causes for these delays alongside it the other causes such as inadequate personnel, long decision making process, and late release of funds, incompetent Contractors, and poor project management. Further, investigations with a specific aspect in PCP, design and documentation, pinpointed that inconclusive feasibility study, inadequate personnel, unclear brief, inadequate resources, lack of commitment, inexperienced officers and inadequate time were major causes of inadequate design and documentation. Inadequacy in design and documentation would cause inadequacy in PCP since it is an aspect of PCP. In addition, the study recognized that the end result of established inadequacies in the PCP process would be substandard buildings, cost overrun, time overrun, variations and strained relations.

To counter the leading factors identified to be causing delays in project delivery, the study went ahead to propose mitigation measures to these factors. The very important mitigation measures highlighted in the findings included; enhancing efficiency of the PCP process review of project implementation process, boosting capacity of project implementation staff, instituting stiff penalties on those who do not comply with set

procedures and reviewing the staffing level and structure for project implementation. The findings of this research questions would therefore support the key objective of this study which was to formulate an institutional framework for preconstruction planning for public buildings projects.

4.3.5 Conclusion to data analysis

Preconstruction planning is the first stage in project implementation. The study findings established that the factors at preconstruction planning stage are contained within the PCP process and are: project inception, feasibility study and appraisal, design and documentation, tendering, and ends with contract signing and site handing over. Four institutions were identified in the findings as main actors on the factors highlighted and included: MOPW, the Client who were government MDAs, the Treasury and the Contractor. Under these entities five are identified on the Client side and four on MOPW side. These institutions would form part of the PCP framework along with the factors identified.

The findings established that the extent of PCP application was actually high. Majority of the respondents highly agreed that efficient PCP would enhance projects timely delivery. Majority of the respondents agreed that PCP greatly affected the projected project completion time. Further findings were that public building projects were not completed within the projected contract period and that at completion; majority of projects had doubled the projected time period. The study identified the leading causes for these delays to be inadequate personnel, long decision making process, and late release of funds, incompetent Contractors, inadequate PCP and poor project management.

Further, investigations with a specific aspect in PCP, design and documentation, pinpointed that inconclusive feasibility study, inadequate personnel, unclear brief, inadequate resources, lack of commitment, inexperienced officers and inadequate time were major causes of inadequate design and documentation. This inadequacy in design and documentation would eventually cause inadequacy in PCP since it is an aspect of PCP. In addition, the study recognized that the end result of established inadequacies in the PCP process would be substandard buildings, cost overrun, time overrun, variations and strained relations.

To minimize the impact of the identified factors causing delays in project delivery, the study proposed mitigation measures to these factors including, enhancing efficiency of the PCP process review of project implementation process, boosting capacity of project implementation staff, instituting stiff penalties on those who do not comply with set procedures and reviewing the staffing level and structure for project implementation. The findings of this research questions would therefore support the key objective of this study which was to recommend an institutional framework for preconstruction planning for public buildings projects.

4.4 Discussions

4.4.1 Introduction

This chapter discusses study findings as per the responses from the interviews and exploratory case study on projects sampled. It further compares the findings of the study to other studies in similar field that had been undertaken by other researchers in various parts of the world. The discussion answers the research questions outlined by the study as detailed in section 1.5.

4.4.2 What are the factors at preconstruction planning stage?

This research question was aimed at identifying factors at preconstruction planning stage and specific questions were addressed to the respondents with an intention to get a conclusive answer. The findings established that these factors were intertwined with the preconstruction planning process and could be classified at various stages from project inception, feasibility study and analysis, design and documentation to tendering and finally contract signing and site hand over to the Contractor. The factors identified would be useful in developing a comprehensive framework to guide the whole process of preconstruction planning.

4.4.2.1 Preconstruction planning process

Preconstruction planning is a front end important phase in project implementation. The success in implementation of a project and its timely completion are to a great extent related to the preconstruction planning process and its importance cannot be understated (Kerzner, 2001).

The findings from this study revealed interesting aspects in preconstruction planning and how they influence timeliness in building project completion. The findings established various phases within preconstruction planning namely; project inception phase also referred to as project identification and formulation, feasibility study and appraisal phase, design and documentation phase, budgeting/funding, tendering, contract signing and site handing over. These stages makeup the first phase in project development cycle which is preconstruction planning. These findings are in line with Goodman (1988) and Kerzner (2001)'s statements on project implementation. The study findings establishes that after a conclusive preconstruction planning, a project

then moves to the execution stage where the actual works commences on the project. The aforementioned phases are discussed hereafter in detail as processes in a preconstruction planning process. These phases will form the factors in developing the PCP process flow.

Need identification by the Client is considered in the project inception phase within the project preconstruction planning process as mentioned by 70.8% of the respondents. This is the point where the clients going by their strategic plan, strategic objective and in line with the national policy identify the asset gaps that exist with respect to building need. Therefore, a need has to exist in order for a project idea to be initiated. These findings agree with the earlier studies by Goodman (1988), Ramakrishna (2010), Federal Transit Administration (2006), Kerzner (2001) and Gibson *et al* (2006) who have highlighted a similar aspect. The project inception stage is where the Client identifies need, prepares a preliminary brief, and identifies the source of funds to the project to proceed to the stage of feasibility study and appraisal.

Brief formulation is another activity mentioned 79.2% of the respondents. When a project idea has been conceptualized, the Client is expected to formulate a brief giving detail on appearance of the building including the scope and other specific requirements. Unclear briefs by client would result to delay in project completion as brought out by the findings and this corroborates the views of Goodman (1988) and Gibson *et al (*2006). This aspect is crucial to the PCP process hence ownership by the key players and approval of the formulated brief at policy level would assist the ownership.

Need submission was mentioned by 15 out of 24 respondents translating to a 62.5% response rate. The client, as the study reveals, is expected to submit its project need to MOPW which is in line with MOPW (1974). The findings also indicate that this activity in some cases is done by the client project management team agreeing with Kezner (2001) that the Liaison officer also attends to need submission. However from the findings the client liaison officer is only identified in the PCP structure and not in the process. Talukhaba (1988) also recommends that clients should be clear on requirements before approaching a design team so as to limit variations. This is supported by the finding in that this aspect influences timeliness in project completion. Nguyo (1988) qualifies the need of an in-house professional for purposes of liaising with MOPW. The preconstruction planning process should provide the specific entity including who would submit the project to the MOPW and who in MOPW receives the submission.

Constitution of a design team is indicated in the findings as the process expected to take place once the Client has formally handed in the project need to the MOPW which supports MOPW (1974). The design team comprises professionals in the technical areas in building construction who include architects, quantity surveyors, structural/civil engineers and electrical/mechanical engineers as indicated by the respondents. This composition is similar to that advocated for by Gibson *et al* (2006) who points out that the design team should uphold sound technical skills. These professionals according to the findings are expected to give input to the process of design and documentation such as provision of site investigation, project drawings and specifications amongst others. The design team as the study outlines should engage the Client in constant consultation to ensure smooth process of project development.

Advice to Client is a factor of PCP with a mention of only 70.8% of the respondents. The responsibility to advice the Client in public building projects lies with the MOPW since it is the Ministry with all the technical staff and the one under the Presidential circular 1/2008 given the mandate to oversee the construction of all public buildings and works (Republic of Kenya, 2008). MOPW after receiving the Client brief is expected to process and advice the Client on the basis of the brief (MOPW, 1974). This nurtures a cordial working relationship between the Client and the technical professionals (Harris 1976). This aspect of PCP allows the Client a clear understanding of the project and processes and may contribute to faster decision making which counts towards improved timeliness in project completion.

Seeking for funds is the responsibility of the Client as confirmed by the study findings. 54.2% of the respondents considered this a necessary step as a project obviously has a cost implication which supports provisions in MOPW (1974). The findings suggest that for public projects, the Client is expected to seek project funding from the treasury by factoring in the projected funding proposal in the budget/printed estimates in support to MOPW (1974) and Federal Transit Administration (2006). The findings therefore support that seeking for funds is a necessary step that should be considered in the preconstruction planning process.

Confirmation of funds is part of the project financing and the findings indicate that the Client is expected to confirm funds for the project. 13 out of 24 respondents at 54.2% mentioned that the Client should confirm from the printed estimates the funding allocation for the project by treasury. This is in support to Federal Transit Administration (2006).

In conclusion on the project inception phase, it would be prudent to point out that the study results revealed project inception phase as the phase where the project's idea is identified and formulated and in the case of public buildings, this is the stage where the Client after receiving project needs from the users and prioritizing the project decides on the implementation strategy for the prioritized projects. Goodman (1988) indicates the importance of this stage of preconstruction planning as being that which sets the stage for successful implementation of a project ensuring that it is a project that will contribute to an institution's success.

4.4.2.2 Feasibility study and Appraisal Aspects

The study findings confirm the importance of feasibility study in PCP (Laufer and Tucker 1987, Kerzner, 2001 and Ramakrishna, 2010). The respondents indicated that inconclusive feasibility study is a cause of inadequate design and documentation which as will be discussed later has influence on timeliness of project completion in support to Nguyo (1988). The findings further confirmed the feasibility study aspects as highlighted by Goodman (1988). From the findings it is noted that in undertaking feasibility study and appraisal on projects, the aspects of value engineering, technical, economic, administration and management, financial, environmental, social, political, statutory, and risk management should be taken into consideration. This is in support of Harris (1973), Talukhaba (1988), Goodman (2008), Heldman (2009) and Gibson et al (2006). The PCP process at feasibility study and appraisal should embrace the aspects to improve on timeliness in project completion.

4.4.2.3 Who undertakes feasibility study?

On the question of who should undertake feasibility study, the findings outline seven options with the leading option being the client getting a mention by 41.7% of the respondents followed by the option of the client together with MOPW design team at 25%. These findings therefore give an indication that feasibility study and appraisal should be the responsibility of the client and the MOPW in support of Ramakrishna (2010), Heldman (2009) and Kezner (2001).

From the foregoing argument, it is noted that the quoted authors do not fully support the option of the Client solely undertaking feasibility study as this study findings suggest. They however prefer the second option highlighted in the findings where feasibility study is undertaken by the Client with assistance from technical experts in this case MOPW who would provide the technical input in project appraisal. The Client should maintain close involvement especially in the economic aspect since they are the financiers and are also accountable to the expenditure on the project.

4.4.2.4 Design and Documentation

This study identifies activities that should be undertaken during the design and documentation phase of preconstruction planning so as to realise timely project completion. The study further indicates that enough time should be dedicated to this phase since it is key in determining achievable project activities and the respective timelines required. This confirms the observations of Goodman (1988) and the provisions of MOR and PW drawings Manual (2006). The elements in design that were mentioned by the respondents are hereafter discussed.

Preparation of preliminary designs with a mention of 58.3% response is undertaken once the design team is in place in support to MOPW (1974). The team is expected to come up with preliminary designs that provide a basis for discussions with other stakeholders. The findings provide for approval of the designs with a response rate of 91.7% which provides for ownership and moving with the right project as suggested by Gibson *et al* (2006) and provided for in MOPW (1974).

Estimates preparation is another activity identified by the study which is undertaken at the design stage. The Design team is expected to develop preliminary estimates for approval by the various stakeholders in the project which is in support MOPW (1974). This activity was rated highly an indication of the importance of this aspect in PCP and confirms Federal Transit Administration (2006). It therefore follows that preconstruction planning must produce cost estimates for the projects as the estimates assists further processing of project and in decision making.

Detailed designs are effected once the preliminary designs are discussed and input from other stakeholders are incorporated. The design team proceeds to refine the designs and come up with detail designs. This aspect has a response rate of 87.5% an indication of the appreciation of the need of its input. The Ministry of Public Works provides the manual for drawings MOR and PW (2006), for undertaking detailed designs however, none of the respondents referred to this manual. The non-reference to the drawing manual may infer minimal use of this document.

Bill of Quantities preparation provides details of the specification and cost implications of the projects. This had an appreciation rating of 37.5% and a necessary

document rating of 87.5%. Goodman (1988) implied the need for this referring to this as specification for construction facilities and equipment.

Designs and estimates approval comes in when the estimates and designs have been developed. These documents should undergo approval by authorities and stakeholders involved in the project. The primary stakeholder being the Client who must give his approval in order for the project to move to the next step and this had a response rating of 87.5% which agrees with Gibson et al (2006) findings. The other approving entity at a rating of 16.7% is the MOPW Heads of technical department who include the Chief Architect, Chief Quantity Surveyor, Chief Engineer, Structural and the Chief Engineer and the Electrical and Mechanical (Building Services). The rating implies that this approval has no value addition. Additional approvals for the designs and estimates as brought out in the findings are undertaken by the project financiers and statutory bodies NEMA and local authority with a rating of 4.2% each a surprising rate considering that this are statutory requirements. This gives an indication that the requirements are not applied for public projects which agrees with the provision of BOOM (MOPW, 1974).

Preparation of works schedule is another aspect brought out in the study findings with a rating of 16.7%. It is a detailed programme of works containing the activities, durations and resource requirements which supports Goodman (1988) and Laufer and Tucker (1987). The study found out that a schedule for the project should be prepared during the design and documentation stage. For an effective detailed works schedule to be prepared all the project aspects require to be clearly articulated. It is therefore a necessary process in preconstruction planning as brought out in this study.

Documents at design and documentation are output documents which would be core in referencing in project implementation as brought out in the study findings. This confirms the works of Federal Transit Administration (2006) and Hastak et al (2008). This study on its part outlines the documents as the Client brief, Bill of Quantities, estimates, site plan, procurement plan, works programme, project specifications and concept papers. Additional documents are tender, legal such as land ownership title. Feasibility study and appraisal, site analysis and EIA reports in addition to project preliminary and generic designs, working drawings and models are other documents at this stage. This supports Goodman (1988), Kezner (2001) and Federal Transit Administration (2006). Among the above mentioned documents the most referred to as per the study findings were: drawings/designs, BOQs and tender documents.

The study highlights the importance of design and documentation and recommends that it should be carried out in a detailed manner to allow for conclusive project documentation and precise forecast of project delivery time in support to Kerzner (2001). Gibson *et al* (2006) explains that failure to properly address design issues in pre project planning could severely impact on the cost and schedule performance of the project thereby impacting negative on timely completion of projects.

The study findings pointed to the direction that design and documentation was vital to project delivery in that it was in this phase that projects schedule is drawn based on the scope and other project specifications.

Preparation of a Procurement Plan defines the procurement requirements for the project and how it will be managed and includes all the stages in the project implementation to contract closure. The plan identifies and defines the items to be

procured, the type of contracts to be used in support of project and the contract approval process and decision criteria. In the public sector this process is guided by the public procurement and disposal act 2005 and the related regulations. This aspect is appreciated by the respondents with a response rate of 33.3%. Laufer and Tucker (1987) suggest alternative kinds of procurement where a contractor is brought in early. Federal Transit Administration (2006) also provides for other delivery methods which include: own forces delivery, Construction Manager at risk, design/build, design/built/operate and maintain. This author therefore suggests that a procurement plan should include such things as types of contract to be used which would depend on the nature of the service and choices on the division of risk between the owner and the contractor.

Tendering follows after the preparation of tender documents during documentation stage. Tendering at this stage of preconstruction planning is solely for the identification of the project contractor in support to Lyson and Farington (2006). The study findings give importance to this process with a response rate of 95.8% in support to Nguyo (1988). The study findings showed that the tendering process is undertaken as per the public procurement regulations in support of Republic of Kenya (2005).

In the tendering process bids are received followed by evaluation and award of contract to the successful bidder (Republic of Kenya, 2005). The Client is expected to issue an acceptance letter to the Contractor who intern provides insurance and a performance bond. The contract signing then follows between the Contractor and the Client organization's Accounting officer after which the site is handed over to the Contractor and the actual works then commences. With the handing over of the site to the Contractor, the process of preconstruction planning is considered complete (MOPW

1974). Nguyo (1988) however points out that as much as this is well articulated there is a challenge of enforcement and discipline in application.

To conclude on the preconstruction planning process, it would be necessary to note that the processes as identified in the study indicate the activities that are carried out during the process. This PCP process is summarized in Table 4.15.

Table 4.15 Summary PCP process findings vis a vis published findings

Finding	Score	Published best practice
• Need identification by Client	70.8	Confirms Kerzner (2001), FTA (2006), Gibson et al (2006) and Ramakrishna (2010)
• Brief Formulation	79.2	Confirms Goodman(1988) Gibson et al (2006)
• Need Submission to MOPW	62.5	Confirms Talukhaba (1988), Kerzner (2001), FTA (2006) Gibson et al (2006) and Ramakrishna (2010).
• Constituting the design team	54.2	Supports MOPW (1974) Gibson et al(2006)
• Advice to client (design team/client consultation).	70.8	Confirms Harris (1973), MOPW (1974).
• Seeking for funds	54.2	Supports MOPW (1974) and FTA (2006)
• Confirmation of funds	54.2	Confirms FTA (2006)
• Feasibility Study	33.3	Supports Laufer and Tucker (1987), Harris (1973), Talukhaba (1988), Kerzner (2001), Gibson et al (2006), Heldman (2009) and Ramakrishna (2010)
• Preliminary designs.	54.2	In support of MOPW (1974) and Gibson et al (2006)
• Approval of preliminary designs	91.7	In support of Gibson et al (2006)
• Estimates preparation	54.2	In support of MOPW (1974) and FTA (2006)
• Detailed designs	87.5	In support of MOR &PW (2006).

		Manual not mentioned by respondents
• Bills of Quantities	37.5	Confirms Goodman (1988)
• MOPW HOD approval	12.5	No reference
• Designs and Estimates Approval	87.5	Agrees with Gibson et al (2006)
• Preparation of Works Schedule	16.7	In support of Laufer & Tucker (1987) and Goodman (1988). A surprising rating as Laufer & Tucker (1987) indicates that mostly PCP concentrates on scheduling at the expense of other PCP factors.
• Preparation of Procurement Plan	33.3	In support of Laufer & Tucker (1987) and FTA (2006) authors suggests various types of procurement.
• Tendering	95.8	Supports Nguyo (1988) and statutory provisions of Republic of Kenya (2005)
• Contract Signing	16.7	In support of MOPW (1974) and Republic of Kenya (2005). Surprising low rating this being a statutory provision
• Site Handing Over	54.2	In support of MOPW(1974)

The study further confirms that preconstruction planning processes are vital in providing a clear guideline on what aspects need to be considered while undertaking preconstruction planning and further gives a clear direction on how the process should be carried out. This provides a sequence that could be consolidated and linked to the actors that would be identified in the institutional structure to give a framework for the preconstruction planning stage.

4.4.2.5 Preconstruction Planning Institutional Structure

Preconstruction planning institutional structure is the other aspect considered in this study as contributing factor in preconstruction planning. This provides the key stakeholders in the preconstruction planning process who are expected to undertake various responsibilities in the process which confirms Ackoff (1983) referred to by Laufer and Tucker (1987). The current preconstruction planning structure for public sector building projects as identified in the study is organized with 4 key stakeholder institutions. The institutions are client with its key actors, MOPW with its key actors, the treasury and the contractor. The study findings identify eleven actors as preconstruction planning stakeholders who exist within the project preconstruction planning structure. Four actors, the Project manager, design team, MOPW technical HODs, exist within MOPW. The remaining five, the tendering committee, Client Project management committee, tender evaluation committee, Client PS/policy level, and project liaison officer exist within the Client institution. The other actors in this process as brought out in the study are the Treasury and the Contractor. The responsibilities of these key stakeholders as shown by the study findings are discussed hereafter. This structure confirms the position stated by Laufer and Tucker (1987) and MOPW (1974).

Tender committee is a standing committee that adjudicates and recommends bids submitted by prospective Contractors. The public procurement and disposal regulation 2007, provides for the guidelines for the identification of the Contractor and the institutions involved in the processes. The tender committee is one of these bodies, (Republic of Kenya, 2007). The main responsibility of this committee as the study

results indicate is majorly to adjudicate the bids and award contract to the winning bidder. The committee is expected to guide the tendering process.

Client Project Management Committee is set up by the client to steer various activities in project inception and implementation activities. The study suggests that the committee should comprise of senior management staff in the client ministry. This committee is the one that is supposed to receive project concepts identified by the various user departments. The committee then confirms the projects, determines their viability and subsequently rationalizes the projects and prioritizes them. After the Client project management committee prioritizes projects it is expected to submit the project to MOPW for preparation of designs. Prepared designs are submitted to the client project management committee who recommends to the senior management for approval. This process confirms Ramakrishna (2010) point of view. In the case of public building projects expert consultant is MOPW which the committee is expected to consult with constantly. The study findings indicate that this committee is the one to oversee the overall implementation of the projects which agrees with Laufer and Tucker (1987).

MOPW Technical Structure was identified in the institutional structure confirming MOPW (1974). The Ministry acts as a consulting entity for other government institutions. It therefore must have professionals who understand the client organization behaviour while at the same time uphold sound technical skills (Gibson *et al* 1985).

Project Design Team was specifically identified in the study in support to MOPW (1974). The design team is expected to prepare designs and documentation, check and

approve the designs and BOQs and to undertake site visits a finding that supports Gichunge (2000) and MOPW (1974).

Project Manager is identified as an actor in the preconstruction process in support of Kerzner (2001) and Neal and Neal (1989). The Project Manager should be a person with technical skills in production of buildings and the persons with the mandate for building projects implementation are from MOPW, Republic of Kenya (2008).

Client Liaison Officer is an entity identified in the study. The project liaison officer is the point person from the client side to act as a representative project coordination. The study findings outlines that the Project liaison officer should be with the client project management committee. The Project Liaison officer is the one who deals directly with MOPW on behalf of the client. This finding confirms suggestion by Nguyo (1988).

Client PS/Policy level as in the study findings is the one that makes final decisions and approvals within the Client ministry which confirms the position in Republic of Kenya (2006) and Ramakrishna (2010).

The Contractor falls at the tail end of the preconstruction planning process from the study findings. Contrary to the study findings Laufer and Tucker (1987 and Gibson *et al* (2006) as cited by Song *et al* (2009) suggest the Contractor maybe brought in during initial stages of preconstruction planning. These suggestions thus imply the possibility of tendering being undertaken after project inception. The stage at which the tendering takes place is outlined in the procurement planning.

Treasury was also identified in the study findings to be a critical institution in the PCP process. Funds for development projects are sought from the treasury who has mandate

to manage national funding process (Republic of Kenya, 2008). Project funds are sought by the Client wherein Treasury is expected to confirm the funding for the project by inclusion of a budget item for the project in the printed estimates. This would give the Client the go ahead with project implementation.

4.4.2.6 Summary on discussion to the research question, 'what are the Factors at Preconstruction planning stage?'

To summarise the discussion on the research question on factors at preconstruction planning stage, the factors are presented in the preconstruction planning process and the institutional structure. The process as the study established starts from project inception where the project need is identified, project brief prepared, possibility of the funding sought and the project submitted by the Client to MOPW and the feasibility study and appraisal then follows. This study establishes the preference for this to be undertaken by the Client with assistance from technical experts in this case MOPW who would provide the technical input in the project appraisal.

The Client should however maintain close involvement especially in the economic aspect since they are the financiers and are also accountable for expenditure on the project. After the project is determined to be feasible and economically viable, the study indicates that design and documentation should follow. This was emphasized to be a vital stage to project delivery in that it was in this phase that projects schedule are prepared based on the scope and other project specifications. The team involved in this phase must therefore adhere to accuracy in predicting the expected project completion time. The PCP process then ends with tendering process, contract signing and site handover. The successful bidder identified after the evaluation of bids is awarded the

contract upon provision of performance and insurance bond after which the contract is signed and the Contractor takes possession of the site.

The identified factors were considered as activities within the PCP process and to realize them actors need to be identified and each allocated responsibilities. The study identified that actors were classified into four key institutions; the client, MOPW, Treasury and the contractor. The factors and entities would form key ingredients in the PCP framework to be developed in this study.

4.4.3 To what extent is formal Pre-construction Planning applied?

The study purposed to examine whether preconstruction was being applied in public building projects. The specific goals were to establish the extent of application of preconstruction planning to interrogate whether efficient preconstruction planning had a bearing on project timeliness and to establish the effects of preconstruction planning on project timeliness.

4.4.3.1 Extent of preconstruction planning

The respondents indicated that the extent of application of preconstruction planning was high at 66.7%. In other findings in this study 95.8% of the respondents mentioned long decision making processes and inadequate/late release of funds to be the leading factors causing delays in project completion. These two aspects were also identified as factors at the preconstruction planning stage. This therefore confirms that even though the extent of PCP was mentioned to be high by the respondents the major aspects in the process were not adequately undertaken making the whole process to be inefficient including timeliness in project completion. This finding confirms what Laufer and

Tucker (1987) asserts.

4.4.3.2 Efficient Preconstruction planning and project timeliness

The study findings in this section confirmed the main objective of the study since 70.8% of the respondents highly agreed with the fact that efficient preconstruction planning improves project timeliness. It should thus be noted that efficient preconstruction planning eliminates delays in project completion just as Al Ghafly (1995) cited in Assef (2005) attributes project delay to poor early planning. Preconstruction planning as the study established starts from project inception to awarding of contract, contract signing and eventual site handing over. Efficient PCP implies that all these aspect are coherent and efficient. Inefficiency in one aspect would affect project timeliness thus checks would be necessary to ensure efficiency all through. As alluded by Nguyo (1988) unprofessional practices which results in awarding of contracts to incompetent Contractors could cause delays in completion of works and contract award is within the PCP process. Therefore, ensuring efficiency in all the aspects of PCP would make the entire process eventually improve project timeliness.

4.4.3.3 Effect of preconstruction planning on project timeliness

The study established that preconstruction planning affects timely project delivery with a response rate of 83.3% affirming the objective of this study and confirming the need to streamline the PCP process so as to improve on project timeliness. Since the findings established that preconstruction planning affects project timeliness, inefficiencies that arise from the process would affect project completion in a negative direction as confirmed by Al Ghafly (2005) cited in Sadi (2005).

4.4.3.4 Summary on discussion to the research question ‘to what extent is formal Preconstruction Planning applied?’

To conclude this study question the findings reveal that efficient preconstruction planning has a bearing on timely project completion. Stakeholders involved in project development therefore need to give adequate attention to preconstruction planning as it greatly affects the delivery of a project as confirmed by the findings. The respondents further pointed out that the extent of application of preconstruction currently was high nevertheless the high application does not translate to improved timely delivery with the inference therefore of ineffective application. This is well qualified with the respondents indicating that improved application of planning process would improve project timely completion. This would make it necessary to review the current process and make in achieve its desired objective in ensuring project timeliness.

4.4.4 How can the current preconstruction planning process be improved?

From the aforementioned findings it would be crucial to propose the most proficient way an efficient PCP process that positively influences timeliness in project completion. The study identifies the problem stated by giving the situational analysis of the current project delivery. Causes of delay were then established and mitigation measures put forward including proposing a framework for PCP.

4.4.4.1 Situational Analysis on Current Project Delivery

The case study findings confirm the study problem as to whether PCP is adequately applied in that none of the projects sampled were completed within the projected completion time period. The average time elapsed for the sampled projects were

established to be 209% while the mean percentage completeness of the projects was at 87.54%. This implies that the completion rate for all the projects studied had gone beyond the projected completion time. Further these study results indicate a positive skewness in distribution of percentage time elapsed on project completion. This implies that most of the cases mentioned lay below the mean while a few of the case were above the mean. Thus, majority of the percentage time elapsed were below 209% up to a minimum of 91% for the projects studied. Similarly, the distribution of percentage of project completeness among the sampled projects was negatively skewed about the mean percentage of 87.54% meaning majority of the projects studied were near 100% complete even though they were past the projected completion time. Going by the study findings, it is worth noting that most public building projects are not completed in time and there are a number of contributing factors to this scenario as identified by the same findings. These factors can be mitigated at the preconstruction planning stage. Therefore, to achieve timely delivery of projects these contributing factors have to be identified and mitigation measures put forward to address them. The framework of PCP process should clearly show how these measures could be addressed.

4.4.4.2 Causes of Delays in project completion time

The research sought to confirm the factors that contribute to delays in projects delivery so as to suggest mitigation measure that can be applied early enough to deter this scenario. Other than preconstruction planning, the respondents mentioned that delays in project delivery were mainly due to inadequate personnel at 100%, long decision making process at 95.8%, inadequate financial resources to undertake preconstruction planning at 91.7%, incompetent Contractors (83.3%), poor project management at 75% and delayed payments at 58.3%. As much as these are mentioned as being outside PCP,

various studies place them as being within the PCP Goodman (1988). The exploratory case study confirmed a number of the factors causing delaying with the leading factor being delayed payments. Other factors experienced during the execution stage seem to have a rooting from the preconstruction planning stage and therefore can be mitigated at this stage as revealed in the findings. The finding confirms Nguyo (1988), Chan and Kumaraswamy (1998) and Ghafly (1995) both cited in Sadi (2005).

4.4.4.3 Causes of Inadequate Design and Documentation

Inadequate design and documentation which is an important aspect of preconstruction planning has a negative impact on the overall project delivery. The study findings established factors that influenced inadequate design and documentation to be inconclusive feasibility study at 66.7%, inadequate personnel at 62.5%, unclear brief by the Client at 62.2%, inadequate resources at 58.3%, lack of commitment at 58.3%, inexperienced officers at 58%, inadequate time for design at 45.8%, in disciplined officers at 45.8% and lack of synergy among the project team at 41.7%. These factors could be addressed at the preconstruction planning stage to avoid negative effects at the project execution stage. Neale and Neale (1989) agrees with these findings by pointing out that effective planning could only be achieved with the commitment of senior management, provision of sufficient resources and development of knowledge and skills. Laufer and Tucker (1987) on their part acknowledge that the problem stems primarily from inadequacies of the qualifications, orientation and motivation of the parties involved. Nguyo (1988) also concludes that design participants undertook project design with inadequate data on project requirements, funding and site conditions. He therefore attributes the inadequacy to partly due to poor coordination of stakeholders during design and documentation and unclear processes of tying up the

documentation. These authors therefore confirm the factors as raised by the respondents as causing hindrance to achieving efficient plans thereby impacting negatively on project completion.

4.4.4.4 Effects of Inadequate Design and Documentation

The finding goes further to reveal that if the factors causing design and documentation inadequacy were not addressed in time then it would be likely to end up with substandard buildings at 100%, cost overrun at 87.5%, time overrun at 83.3%, variations at 79.2% and further lead to a strained relation between the client and project team at 75%. This is confirmed by Gibson (2006) who explains that failure to properly address design issues in pre project planning could severely impact on the cost and schedule performance of the project.

To ensure adequacy of design and documentation, it would be therefore necessary to apply stringent measures right at the initial stage of preconstruction planning as suggested by George *et al* (2008) that potential problems could be identified proactively before they greatly affect project cost and schedule at the planning phase. Another recommendation is put forward by Talukhaba (1988) who suggests that Clients should be clear on requirements before approaching a design team to limit variations which could affect completion time. Effective design and documentation as a component of preconstruction planning would thus be pivotal in radically reducing project cycle time as supported by Hastak *et al* (2008).

4.4.4.5 Mitigation Measures

Factors attributed to delay mentioned by the respondents in this study can be identified early during the preconstruction planning stage and mitigation measures put in place. The study findings recommend that the delays can be addressed through a thorough review of project implementation process at 95.8%, undertaking a conclusive preconstruction planning at 87.5%, building capacity of project staff, instilling stiff penalties for non-compliance with the project schedules and timelines and reviewing staff levels and structure each at 66.7% and also ensuring adequate funding for projects. These mitigation measures form part of measures that could be looked into during planning stage before a project execution commences. Gibson *et al* (2006) agrees with the findings by recommending that in preplanning a standard preplanning process should be used involving technically proficient personnel with owner involvement ensured. Further, the study results indicate that the preconstruction planning should be institutionalized so all stakeholders are familiar with the process and are involved in it. This finding confirms a suggestion put across by Nyandemo and Kongere (2010) who were of the opinion that Project planning should be 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. This institutionalization of the preconstruction process as recommended in this study and supported by other studies reviewed would be more convenient through a harmonised process flow for the entire PCP process. This proposes a framework which is discussed in the section 4.4.4.6.

4.4.4.6 The Preconstruction Planning Process Framework

The framework which has been developed from the findings of this study provides for seven key parts in the preconstruction planning stage with eleven key actors in the implementation processes. The PCP processes are project inception, feasibility studies and appraisal, funding, preliminary design, design and documentation, tendering, release of funds, contract signing and site handing over. The entities to take the process through on the side of the Client are the Permanent Secretary (PS), Project Management Committee (PMC), Ministerial Tender Committee (MTC), Project Liaison Officer (PLO) and the Tender Evaluation Team (TET). On the side of MOPW the entities include the Permanent Secretary (PS), Project Manager (PM), Technical Heads of Departments (HODS) and Design Team (DT). Other key players identified in the study are the Treasury and the Contractor.

Project inception is where the need for a project is identified, project concepts are drawn, projects are rationalized, prioritized and a preliminary brief developed by the Project Management Committee (PMC).

The Project Management Committee submits prioritized projects to the Client PS who on preliminary approval of the project and having received preliminary indication of funding from Treasury has the PMC forward the Project to the PS, MOPW with a Project Submission Sheet. On receiving the Project the PS MOPW recommends for the appointment of a project manager for the project. The Client PS then appoints the Project Manager. The project is handed over to the Project Manager (PM) who has the project entered into the Annual Works Programme (AWP), a projects' records register for public works. The Project Manager also receives the design team who are released

from the technical departments. The project Manager at this stage prepares a Project Manager's handbook that guides the whole process of the entire project implementation. At this stage the Design Team with continuous consultation with the Project Manager prepares a project design programme, receives the project preliminary brief and advices the Client through the PM on any issues on the project brief. This process is coordinated by the liaison officer on the Clients side and the Project Manager on the MOPW's side. With the aforementioned accomplished, the project enters the feasibility study stage.

Feasibility study is the stage where the Design Team undertakes technical feasibility of the project which includes site survey, site investigation and preliminary estimates which through the Project Manager is forwarded to the Client Management Team to be included in the complete feasibility of the project. The Management Committee on confirming the viability of the project seeks project approval from the Client PS. This project approval is forwarded to the PM who prepares a procurement plan for the project which through the Management committee is given for approval to the Client PS. On approval of the plan the PMC seeks funding from the Treasury and on allocation of funds the process of preliminary design should commence.

Preliminary design is the stage wherein the design team prepares this together with the preliminary estimates and final brief. This goes through the PM to the PMC who recommends for Client PS approval. Once the Client PS approves the preliminary documents it is communicated to the PM through the liaison officer and the Project Manager guides the next stage of the design and documentation.

Design and documentation is the stage wherein the design team prepares the detailed designs, the Bills of Quantities and specifications, the tender documents which on approval by the respective MOPW Heads of Department are passed on to the Project Manager who if in agreement passes to the PMC for review and recommendation to the Client PS for approval. At this the PMC also confirms to MOPW the availability of funds. Once the Client PS approves the tender documents the next stage of tendering is undertaken.

Tendering is the stage where if the calling of bids is by restricted tender, the MOPW's Heads of Department recommends bidders who are adjudicated by the Ministerial Tender Committee (MTC) and approved by the Client PS. Bids are invited by the PMC with the recommended bidders or in open tender where bids are invited from the qualified parties. While the bids are being awaited for return, the technical Heads of Department recommends an evaluation team who though the PM and PMC is appointed by the Client PS. Once the bids are received by the PMC they are forwarded to the appointed technical evaluation committee who on evaluation recommends the responsive bidder for adjudication and awards to the MTC. On award the MTC seeks approval of project award from the Client PS. On approval of award the project goes to the next stage of confirmation of release of funds.

Release of funds is confirmed by the PMC from the treasury to allow, the project proceed to the next stage of contract signing.

Contract signing is the stage where approved bids from the Client PS are forwarded to the PS MOPW for the preparation of contract documents. Meantime the Client PS sends an acceptance letter to the awarded bidder asking for provision of a performance

Bond. The tender documents are prepared through the PM by the design team. These tender documents are prepared through the PM by the design team. Tender documents are forwarded to the Client PS for signing with the winning bidder/Contractor. Once the Client PS has received the performance bond from the Contractor and received the contact documents, the contract is signed. Once the signing takes place the PM arranges for a site handing over meeting which is attended by the Liaison Officer for the Client, the design team, the Contractor and coordinated by the Project Manager. By this time the Contractor should have provided the insurance for the works. The contractor should at this time commence work within the conditions agreed on for mobilizing. The process flow of this framework is shown as figure 4.13

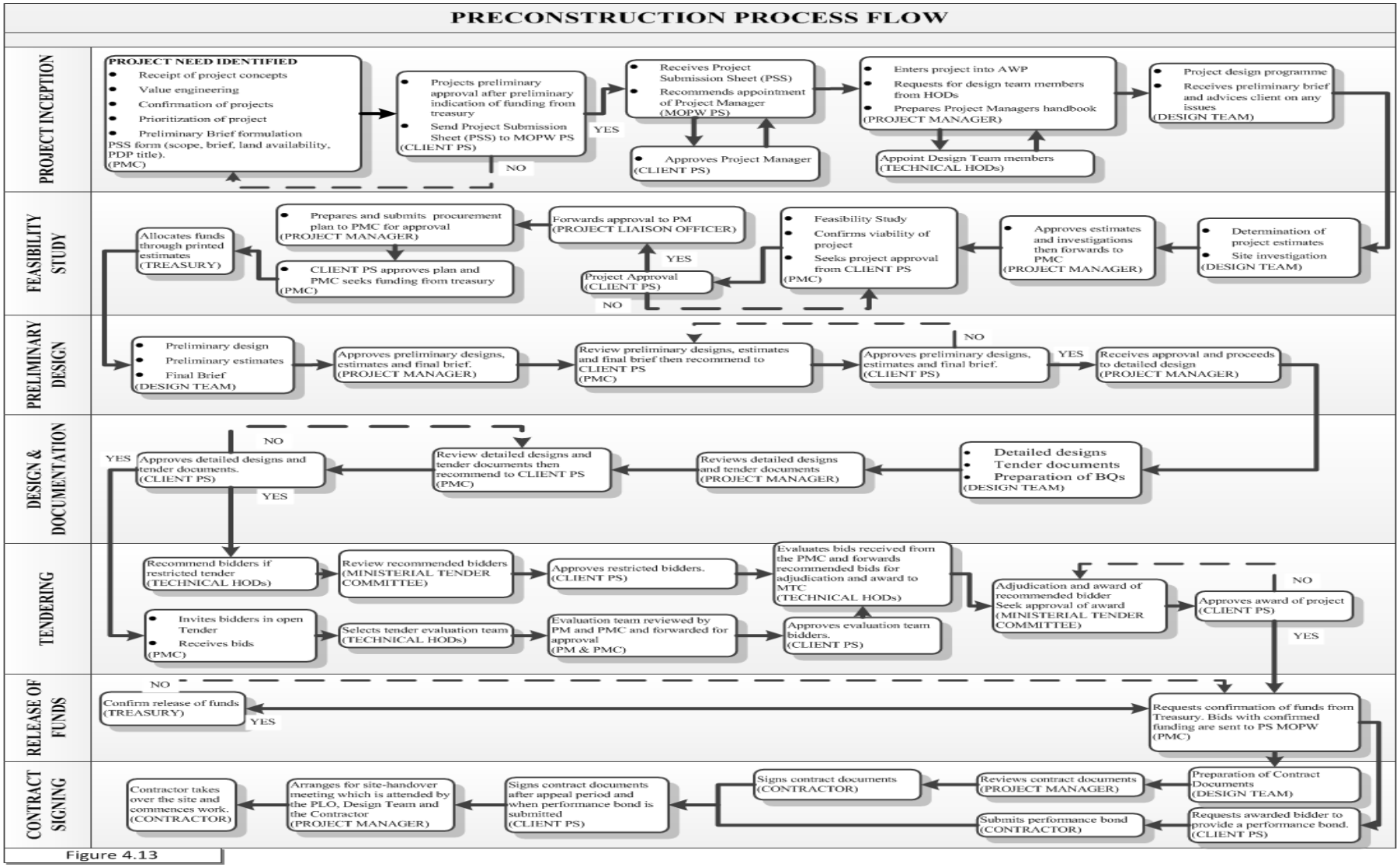

Figure 4.13

Figure 4.13 Preconstruction process flow.

4.4.4.7 Summary on discussion for research question ‘how can the current preconstruction planning process be improved?’

The findings under this section of how the current preconstruction process can be improved revealed that public building projects take double the projected time before completion. This was so due to a contingent of factors which compromises the efficiency of the PCP process and making the processes not to achieve its intended goal of improving project timeliness. Discussion on this research questions are concluded by identifying mitigation measures and which contributes towards the framework for the preconstruction process.

4.4.5 Conclusion to the discussion

This study through its findings established that majority of public building projects are not completed within the projected timeline. Majority of the projects would take up to double their projected completion time by completion time. This was due to ineffective or non-application of a contingent of factors at preconstruction planning stage that influences project delivery. Significant factors as revealed by the study are within the preconstruction process which begins with project inception, feasibility study and appraisal, design and documentation, tendering, and finally end with contract signing and site handover.

The finding further establishes actors within the preconstruction planning process who would be allocated specific responsibilities. The key institutions identified to be vital were, the Client allied institutions such as the project management committee, project liaison officer, the Client PS/policy level, tender evaluation team and the Ministerial

Tender Committee, MOPW allied institution such as the PS/Policy level, Project Manager, the design team and the technical HODs, Contractor and the Treasury.

The findings further highlighted the major causes of delays in project delivery which included inadequate design and documentation, inadequate resources, long decision making processes, inadequate personnel, inadequate time for preconstruction planning, lack of synergy among the project team, inconclusive feasibility study, unclear brief by the Client and lack of commitment by the project team. The identified factors could all be mitigated during the preconstruction planning stage of project development. The consequences of not addressing them are major and would impact negatively on project completion as revealed in the findings. Therefore, to avoid their impact at a later stage of project execution, mitigation measures were put forward the major one being undertaking preconstruction planning process that would be institutionalized to improve on timeliness in completion of projects.

The PCP process provides all the stages of preconstruction planning on one part and the institutions involved (Chandra 2006). Specific actors within the institutions are identified and activities to be undertaken by each actor allocated. The interaction between the actors is clearly stated so as to ensure a synergy by providing for sustained consultation through recommendations, confirmations and approval throughout the PCP process. This idea of developing a framework for PCP is also supported by Gibson *et al* (2006) as he too recommended that a standard process be used in pre planning involving technically proficient personnel with owner involvement ensured. This framework would eventually assist in the institutionalizing the PCP process in support to Nyandemo and Kongere (2010). In the processes of the PCP it is expected that every

respective institution, Client, MOPW, Treasury and the Contractor articulates clear internal processes to effectively perform the roles assigned.

CHAPTER FIVE

5.0 SUMMARY OF FINDINGS, CONCLUSION & RECOMMENDATIONS

5.1 INTRODUCTION

This study aimed at exploring the factors at preconstruction planning that influence timeliness in projects completion. To better understand this the study had three objectives which were to establish factors at the preconstruction planning stage that influence timely project completion, explore the extent to which structured formal pre-construction planning is applied and propose a framework for preconstruction planning for building projects in the public sector. Interviews were carried out with respective respondents and exploratory case studies on 32 projects carried out to validate the responses given by the respondents interviewed. The findings of the study were then analysed along with the research questions earlier discussed in relation to the literature gathered by the researcher. This conclusion is therefore drawn from the study results and discussions are summarised in line with the objectives of the study.

5.2 Findings of the study

5.2.1 Factors at the preconstruction planning stage that influence project timeliness in completion

Preconstruction planning is established as the initial phase in project development that is undertaken before a project goes to the execution stage. The findings reveal that preconstruction planning is vital and have a great bearing on timely completion of projects. Therefore, to ensure that adequate preconstruction planning is undertaken the process as established by this study once institutionalized will improve on the project

completion. The study establishes the process of preconstruction planning to consist of components which include Project inception which is mentioned as the first component in preconstruction planning where a project is identified and formulated. This takes place within the Client institution with intense consultations with other stakeholders. All user departments are required to submit project need which are compiled and presented to the Client project management committee which is in some cases the Client senior management. The needs are then rigorously analysed and prioritised for purposes of funding by the Treasury after which submission to MOPW is undertaken for technical advice.

The second component in preconstruction planning as revealed by the study finding is feasibility study. This is the process of undertaking detailed analysis consisting of technical evaluation, economic, environmental, administration and management, political, social, value engineering and risk management analysis. The outcome of this process is expected to inform the viability of the project that is about to be implemented. The study findings suggest that this process should be spearheaded by the Client with support of the technical professionals.

After a viable project has been determined, the next component that follows in the preconstruction process is the design and documentation. This is a technical process that is undertaken by a design team comprising technical staff from MOPW. The design team is expected to come up with a number of documents that will form a point of reference to the project implementation team. The findings of this study put emphasis on design and documentation adequacy as it is considered a major component that greatly influence the outcome of project implementation if not done properly.

During the documentation it is expected that a procurement plan is drawn up which guides the procurement process up to the award of tender.

Most respondents in this study were clear on the tendering process as they mentioned that the process should follow the procedures provided for in the public procurement and disposal act, 2005 and the subsequent public procurement and disposal regulations of 2006. These legislations provide for the due process of tendering up to award and signing of the contract.

5.2.2 The extent to which formal pre-construction planning is applied

The findings showed that the extent of application of preconstruction planning is high, however the process is not carried out effectively as certain aspects are inadequately addressed yet they have a significant impact on timely project delivery. The respondents thus suggest certain mitigation measure that can be applied at different levels during the preconstruction planning process. These remedies as suggested by the study findings include; review of project implementation process, undertaking a conclusive preconstruction planning, building capacity of project staff, instilling stiff penalties for non-compliance with the project schedules and timelines and reviewing staff levels and structure. Ensuring adequate funding for projects and efficient payment to Contractors also needs to be addressed.

5.2.3 Framework for Preconstruction Planning for Public Building Projects

This study through its findings established that preconstruction planning though highly applied, is not effectively implemented resulting in majority of public building projects not being completed within the projected timeline. Factors that cause delays in project

delivery identified included inadequate design and documentation, inadequate resources, long decision making process, inadequate personnel, inadequate time for preconstruction planning, lack of synergy among the project team, inconclusive feasibility study, unclear brief by the Client and lack of commitment by the project team.

These factors can be adequately mitigated during the preconstruction planning stage of project development. The consequences of not addressing them include substandard buildings cost and time overruns, variations to contract, strained relationships which impact negatively on project delivery completion as the findings reveal. Therefore, to avoid the impact at the later stage of project execution, mitigation measures are put forward which include preconstruction process to ensure on time completion. This can only be achieved by developing and institutionalizing a framework for preconstruction planning giving the clear process and allocating roles and responsibilities to the identified actors at each level within the entire process.

This framework provides a process flow, Fig. 4.13 which gives all the stages of preconstruction planning and the institutions involved. Specific actors within the institutions are identified and activities to be undertaken by each actor allocated. The interaction between the actors is clearly stated so as to ensure that they engage constantly with each other as this improves the efficiency of the whole system.

5.2.4 Summary of the findings

The study revealed twenty one (21 no.) aspects with eleven (11no.) players at the preconstruction planning stage some of which were inadequately and ineffectively

addressed during the preconstruction planning process thus negatively influencing timeliness of project completion. This was majorly due the scattered and disjointed information on PCP processes contained in different documents and lack of a standard framework that interlinks the processes. The study established that preconstruction planning was to a large extent currently applied in public building projects. However, the process was revealed to be inefficient hence not achieving the expected positive influence on project completion.

This study also established that majority of public building projects at completion had been completed at double the time period. The delayed completion of the projects was majorly due to inadequate attention to the influencing factors at preconstruction planning process that causes project delays identified as including inadequate personnel, inadequate and late release of funds, incompetent Contractors, inadequate preconstruction planning, poor project management, unclear brief and delayed payment. Majority of the delay factors as revealed by the study could adequately be controlled at the PCP stage.

5.3 Conclusion

This research thesis provides an exploration of the factors at preconstruction planning influencing timeliness of completion of public building projects and describing them in a framework articulated with a process flow as shown in figure 4.13.

The existing studies reviewed on preconstruction planning factors emphasize on distinctive aspects such as project control, project forecasting, scheduling and the technical aspects without specifically exploring the preconstruction planning factors

that cut across the planning aspects. Further, the building projects implementing agency for the public sector in Kenya, MOPW, currently uses the BOOM as reference document. BOOM has not been reviewed for a long time. This is supported by the literature where different studies were undertaken on isolated factors on specific preconstruction planning aspects and different plans were prepared and not fully utilized in project execution, (Laufer and Tucker, 1987). Five (5 no.) different documents containing the various preconstruction planning factors are used by MOPW to guide the PCP process.

In section 1.4 the main objectives to be addressed by this study were stated as:

1. Establish factors at the preconstruction planning for public sector building projects that influence timely completion of project.
2. Explore the extent to which structured preconstruction planning is currently applied.
3. Formulate a framework for preconstruction planning for building projects in the public sector

The first objective can be viewed as a cornerstone of the entire preconstruction planning. Once factors at preconstruction planning are comprehensively explored and detailed in a harmonized framework, institutionalization of PCP would be an appropriate policy approach.

The study findings reveal that the factors at preconstruction planning constitute of processes and the institutional structure within which these processes are executed. However, the pattern of occurrence of the factors in the findings was not consistent

among the respondents. The factors identified as processes were need identification, need submission by the client in form of a brief to MOPW, advice to the Client based on the need, feasibility study encompassing aspects identified as technical evaluation, economic, environmental, administration and management, political, social, value engineering and risk management analysis.

Majority of these aspects are similar to those highlighted by other authors including Goodman (1988), Kenzer (2001), Ramakrishna (2010), FTA (2006), Gibson *et al* (2006), Talukhaba (1988), Nguyo (1988), Harris (1973) and Laufer and Tucker (1987). Design and documentation follows, the project is then tendered to enable award of contract through a laid down process by the Public Procurement and Disposal Act, 2005 (Republic of Kenya, 2005). Finally, a contract is signed and the site is handed over to the contractor who in turn mobilises before starting execution of the project.

These results indicate that preconstruction planning factors include both the processes and the institutional structure which when designed in a harmonised framework and institutionalized is expected to positively influence timeliness of projects completion. This supports Ackoff (1983) in Laufer and Tucker (1987) and Ramakrishna (2010).

Regarding the second objective, there appeared to be a general agreement that preconstruction planning is currently applied to a high extent. Inadequate preconstruction planning is also identified as a major cause of delay in buildings projects in the public sector along with incompetent contractors. The finding establishes that this inadequacy is mainly due to shortage of personnel, long decision making process and inadequate/late release of funds which can be addressed in

feasibility study as administration and management in Goodman (1988). There is an agreement that preconstruction planning highly influences timely projects completion positively. Earlier studies indicate that preconstruction planning place emphasis on different aspects (Gilbert, 1983, Lichterberg, 1983, Clough 1972, Laufer and Tucker, 1985). These aspects if not well articulated in every project would cause great challenges including coordination of various aspects of planning such as people, organization activities and processes as explained by Neal and Neal (1989). The PCP factors discussed above if detailed in a harmonised framework would positively influence timeliness of project completion.

In addressing the third of the study objectives, inadequate preconstruction planning was identified among the major causes of project delay. As earlier discussed this is due to lack of coordination and a harmonised framework that brings together the preconstruction planning factors. The findings provide that PCP be clearly defined. The findings of the study have therefore been used to formulate a PCP framework in the form of a process flow that would guide building projects implementation in the public sector.

5.4 Contribution to Knowledge

This study identifies the factors at the preconstruction stage and brings out additional aspects that would be useful in reviewing the existing preconstruction planning process and subsequently develops a framework articulated in a process flow diagram. It is recommended that the developed framework be institutionalized to reform and

streamline the current preconstruction planning process as provided for in the outdated BOOM.

The institutionalization of this framework is expected to positively influence timeliness of project completion subsequently improving on service delivery to the people of Kenya. This is in line with the provision in the Constitution of Kenya within the Bill of rights where citizens have the right to efficient public services. Further, Kenya's Vision 2030 outlines that an efficient and result oriented public service is a pre-requisite to realization of the vision.

5.5 Recommendations

The recommendations to the study that have been drawn out of the study findings are articulated in table 5.1.

Table 5.1 Recommendations

No.	Recommendation	Finding
1.	A policy direction to address shortage of personnel is required in order for the public sector to realize timely completion of building projects.	The study established that shortage of personnel was a major hindrance to realizing efficiency in preconstruction planning and project implementation. 100% of the respondents mentioned inadequate personnel as a main hindrance not only to adequate preconstruction planning but also to overall project implementation success. Section 4.3.4.2.
2.	The payment and funding processes for projects should be reviewed to avoid delayed payment which later results into project cost overruns and delay in completion	Late release of funds/delayed payment was identified as a major project delay factor. 91.7% of the respondents reiterated that there was delay in release of funds for projects in addition to delays in payment release to the Contractors with a response rate of 58.3%. Section 4.3.4.2.

3.	The MOPW should embrace research and development so as to encourage innovation, to improve efficiency in preconstruction planning and consequently on timely delivery of project.	The findings revealed that embracing research and development in preconstruction planning would enhance efficiency of the process. 75% of the respondent recommended that research and development be embraced and the finding be applied in project implementation. Section 4.3.4.6.
4.	Review the process of identifying the Contractor	83.3% respondents indicated that delays were brought about by engaging incompetent Contractors. Section 4.3.4.2.
5.	The MOPW should adopt the framework put forward by this study since the current preconstruction frameworks lacks in some aspects key to successful preconstruction planning. All the entities involved in the preconstruction planning should be clearly defined and respective responsibilities articulated to avoid confusion as in the case where a clear definition lacks for the project manager.	The study revealed that the preconstruction planning process was inadequate and highlighted a number of factors that were ineffectively addressed at PCP. The study with a response rate of 100% suggested that PCP be institutionalized and that a comprehensive framework be developed for the PCP process. Section 4.3.4.6.

5.6 Areas for further research

The areas suggested for further research identified are:-

1. Developing a Model for resource allocation for PCP for public sector building projects in Kenya.
2. A study to determine process of identifying competent contractors for public sector building projects in Kenya.
3. Developing a model for project funding and processing of payments to contractors for public sector building projects in Kenya.
4. A review of documentation for public sector building projects in Kenya.

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APPENDICES

1. Sample introduction letter to respondents
2. Interview Schedule with and without indicators 2A & 2B respectively
3. Case study matrix template
4. Letter to respondents to validate transcripts
5. Sample of interview Transcripts
6. Sample of interview concepts
7. Sample of case study findings
8. Data analysis output with Nvivo

Appendix 1. Sample introduction letter to respondents

Arch. AIDAH N. MUNANO

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October, 2011

INTRODUCTION TO INTERVIEW RESPONDENTS

I am currently undertaking a Masters of Construction Project Management with the Jomo Kenyatta University of Agriculture and Technology. My Research topic is '**Assessing the effectiveness of preconstruction planning in improving timely project delivery – A case of Public Sector Buildings Projects in Kenya'.** The objectives of my Research are to;

1. Identify factors at the preconstruction planning stage that influence timely project delivery.
2. Explore the extent to which formal pre-construction planning is applied.
3. Propose a framework for preconstruction planning for building projects in the public sector.

This is to therefore introduce myself to you for the purpose of carrying out an interview towards my Research Thesis.

It is my desire that the findings of this Research will be adopted in the public sector to improve on timely project delivery.

I look forward to your contribution towards this Research.

Yours

Arch. Aidah Munano

Appendix 2A - Interview Schedule without indicators.

INTERVIEW SCHEDULE WITHOUT INDICATORS - 5A

Section A - General

- Schedule No
- Organization
- Profession
- Designation
- Duration in present institution
- Other institution worked with

Overall Responsibilities in those institutions

Overall responsibilities in your present position

Section B - Project Inception/ Identification and formulation of projects

1. What is the process of preconstruction planning for the projects you undertake?

2. What is the institutional structure in preconstruction planning?

Section C - Feasibility Study and Appraisal

3. What aspects of the projects are considered in feasibility study?

4. Who undertakes the feasibility study?

Section D - Design and Documentation

5. What documentation is expected at this stage of Design and Documentation?

6. What causes inadequate documentation and design?

7. What is the effect of inadequate Design and Documentation?

Section E - Overall Preconstruction Planning

8. What is the extent of preconstruction planning for the projects you are involved in?

1. Very high

2. High

3. *Neutral*
4. *Low*
5. *Very Low*

9. Efficient preconstruction planning improves timely project delivery
   i. *Strongly Agree*
   ii. *Agree*
   iii. *Neutral*
   iv. *Disagree*
   v. *Strongly disagree*

10. What is the effect of the extent of preconstruction planning on the projected completion time?

11. What are the causes of delays in project delivery?

12. What measures can be in place to mitigate this?

13. General opinion/suggestions on preconstruction planning in relation to timely project delivery.

Appendix 2B -Interview Schedule with indicators

INTERVIEW SCHEDULE *WITH INDICATORS FOR RESEARCHER'S USE– 2B*

Section A - General

- Schedule No
- Organization
- Profession
- Designation
- Duration in present institution
- Other institution worked with

- Overall Responsibilities in those institutions
    i. Responsibilities related to project implementation

- Overall responsibilities in your present position

    i. Projects Implementation as a core responsibility

Section B - Project Inception/ Identification and formulation of projects

1. What is the process of preconstruction planning for the projects you undertake?
    i. National Policy
    ii. Strategic Plan
    iii. Strategic Objective
    iv. Asset Gap
    v. Project Requirement Plan

2. What is the institutional structure in preconstruction planning
    i. Policy level decision making involvement
    ii. Clear structure
    iii. Existence of Structure
    iv. Institutional Memory

Section C - Feasibility Study and Appraisal

3. What aspects of the projects are considered in feasibility study?
   i. *Technical*
   ii. *Economical/Financial*
   iii. *Environmental/NEMA*
   iv. *Administrative & Management*
   v. *Value Engineering*

4. Who undertakes the feasibility?
   i. *Client/In-house*
   ii. *Joint Team of Client & Consultant*
   iii. *Donor/Financier*
   iv. *Other*

Section D - Design and Documentation

5. What documentation is expected at this stage of Design and Documentation?
   i. *Scheme designs*
   ii. *Detailed drawing*
   iii. *Bills of Quantities/Specifications*
   iv. *Programme/Schedules*
   v. *Project Handbook*

6. What causes inadequate documentation and design?
   i. *Inadequate design time*
   ii. *Unclear brief*
   iii. *Inexperienced officers*
   iv. *Unavailability of information*
   v. *High turnover of stakeholders.*

7. What is the effect of inadequate Design and Documentation?
   i. *Unreliable Contract Sums*

ii. *Cost Overruns*

iii. *Projects that do not meet objectives*

iv. *Sub Standard Building*

v. *Time overrun*

Section E - Overall Preconstruction Planning

8. What is the extent of preconstruction planning for the projects you are involved in?
   1. *Very high*
   2. *High*
   3. *Neutral*
   4. *Low*
   5. *Very Low*

9. Efficient preconstruction planning improves timely project delivery
   i. *Strongly Agree*
   ii. *Agree*
   iii. *Neutral*
   iv. *Disagree*
   v. *Strongly disagree*

10. What is the effect of the extent of preconstruction planning on the projected completion time?

    i. *No effect whatsoever*
    ii. *Somewhat affects*
    iii. *Neutral*
    iv. *Affects*
    v. *Greatly affects*

11. What are the causes of delays in project delivery?
    i. *Lack of Handbook/Poor Project Management.*
    ii. *Poor cash flow*
    iii. *Project Creep/increased scope*
    iv. *Inadequate Brief*
    v. *Inadequate Contract Period*

12. What measures can be in place to mitigate this?
    i. *Thorough documentation and design*
    ii. *Adequate Consultation*
    iii. *Clear process of project identification and formulation*

    iv. *Thorough Feasibility study & Appraisal*
    v. *Use of a Project Manager's Handbook*

13. General opinion/suggestions on preconstruction planning in relation to timely project delivery.

Appendix 3 - Case study matrix template

CASE STUDY MATRIX (Appendix ….)												
PROJECT NAME	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Serial No.												
AWP No.												
Client Name												
Client Liaison Officer												
Project Scope												
Project Cost												
Issues addressed in preconstruction consultation												
Document prepared at preconstruction stage												
Date of Commencement												
Initial completion date												
% Completion												
% Period Elapsed												
Actual Completion Date												
Reason of Delay												
Remarks												

Appendix 4- Letter to respondents to validate transcripts

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Ref: ANM/RS/04/04 **16th November, 2011**

Dear

INTERVIEWS FOR RESEARCH THESIS

VALIDATING THE INTERVIEWS

I take this opportunity to appreciate you deeply for your support in my Research Thesis.

Following the transcribing of the interview, herein attached is a draft for your confirmation whether this is a fair representation of the interview taken with you. This is a requirement for the research method so as to validate the outcome.

Please simply indicate the confirmation/comments o a copy of the draft attached and forward back at your earliest convenience.

Best wishes

Yours sincerely

Arch. Aidah Munano

Appendix 5 - Sample of interview Transcripts

INTERVIEW TRANSCRIPTS - DATA ORGANIZATION (BIO DATA + Q1)					
PROJECT INCEPTION					
	ORGANIZATION	**PROFESSION**	**DESIGNATION**	**EXPERIENCE**	**Q1 - preconstruction planning Process**
01	MOPW	Architect	PSA/Project Manager	26 Years-Design, supervision and coordination of project	Client involvement. Close coordination. Brief taking to be clear from beginning. One on one with stakeholders. Give processes of construction as sometimes Client not clear on this. Involve all stake holders as some not clear on what they want. Use Client ideas to come up with what they want. identify stakeholders and involve them. Identify users and involve them. Appreciate other players i.e. consultants, design team. QS's costing early, all have inputs. Cost of works.
02	MOPW	Architect	PSA/Project Manager	30 Years-Design, supervision and coordination of project	Brief taking, site survey and investigation. Design and documentation. Tendering process.
03	MOPW	Architect	PSA/Project Manager	18 Years-Design, supervision and coordination of project	Client identifies need for assistance and submits projects. Clarification of need with interface of Client and design team. Site investigation and assessing adequacy of site for project. Agreeing on broad programme for activities of projects. Developing of planning concepts including outline of how projects will look like. Preliminary estimates. Securing Clients comments on proposals. Client approving before detailed documentation. Development of design with close interaction of project team members to integrate all services and structures. Research by project time depending on complexity, case studies, detailed design, estimate approved by Client. Decision on procurement arrangement of projects. Proceed to tender, tender analysis. Identify Contractors by evaluation team, contract signing. Preconstruction meeting to give obligations of all parties.

04	MOPW	Architect	SPSA/Project Manager	27 Years-Design, supervision and coordination of project	Request for project from Client giving intention in letter. Prepare PSS forward to Client to confirm need. The PSS has scope, brief, availability of land, PDP title, confirmation of project funding for need to begin. Confirm by signing PSS. Back and forth of brief for formulation and fine tuning. Clients sometimes not clear. Guidance from MOPW to firm briefs. Go to site. Site planning. Cadastral and topo survey. Establish services, water, electricity, access to site. Soil investigations and tests. Commence design, back and forth, critics with Client / MOPW and within. If design acceptable within architectural and overall structural element, mechanical and electrical goes to Client approval. Consultants pretend to know it all. Pass to other consultants. Design team. Back and forth on design as design is the back bone of construction. If design is right construction fits in. Documentation is a representation of design is the best position. Public Sector discrepancy between tender documents and designs for all services. Documentation, specifications and bills of quantities should reflect drawings. Most important drawings. Procurement of construction works, Drawings formally approved by Chief architect and Client. Client approves site plan. Procurement depends on mode chosen. Whether competitive, selective or single sourcing. Most ideal open tender, which gives value for money. Constitutes technical evaluation team, evaluate, prepare report, submit to procurement entity, adjudicate an award, communicate to successful leaders. Inform of a appeal period of no appeal arrange for handover of site. Other bidders informed and thanked for participation. Signing of contract before handover of projects. Contracts signed on Contractor's provision of performance bond. Insurance arrangement. Project Manager calls for pre contract meeting where all parties left to the construction are introduced. Preconstruction meeting before proceeding to sites to issue drawings, BOQs and give clarification of all contract clauses.
05	MOPW	Architect	PSA/Project Manager	28 Years-Design, supervision and	Brief formulation / conceptualization preliminary survey and design. Formation of design team. Detailed design and documentation. Tendering process,

				coordination of project	advertising, opening, evaluation, adjudication and award, possession of site ready for works to start. Aforementioned have sub activities within the processes.
06	MOHA	Administrator	Deputy Secretary	Present 6 years-Monitoring implementation of project development + 20 years, security matters and coordination of government activities	Felt need for project by officer in charge / user if housing needed. A problem to be addressed. Call for meeting with Client department who liaises with the PS. Meeting at Ministry looks into scope. Funding sort with Ministry of Finance. MOPW technical team requested to design and give approximate estimates. Ministerial committee seeks funds with Ministry of Finance PS. Funding factored in budget in the printed estimate. Tenders are advertised within set procedures, bids received, technical evaluation follows, most competitive / lowest responsive with advice of MOPW is notified by a letter of offer with mention of the appeal period for acceptance of offer. Contractor acknowledges and given instructions to proceed to site. Mobililisation period stated and works starts.
07	MOBE	Educationist	Assistant Director	10 years-Management and administration of primary teachers training colleges, recruiting trainees and supervising non teaching staff + 6 years in Quality assurance and inspectorate for standards of education and infrastructure	3 new colleges to give funds for projects. Follow up. Give money to do construction. Older colleges taken. Communities core to Ministries in initiating new colleges. Keep training teachers. Political rallies approach the President. President to Head of the Public Service. Head of the public service to PS of the Ministry. Finance department in Ministry of education seeks funds from Treasury. Funds provided through the printed estimates. These funds are disbursed to the community. The community involves the MOPW. Works are taken in liaison with Public Works. MOPW assist with designs. Client Ministry Headquarters checks on work being undertaken. Works audited by Ministry's and external auditors. Board of governors and management initiate work for existing colleges.
08	MOPW	Architect	SPSA/Project Manager	17 Years-Design, supervision and coordination of project	Client requisition through PSS. Review of scope. Allocate project to design teams. Preliminaries design discussed with Client. Affirm brief. Site visit immediately on receipt of PSS. Preliminary designs and scope determined. Site

				+ 3 years project manager for medical services infrastructure	analysis. Preliminary designs. Includes other engineering services. Preliminaries discussed with other team members. Documentation approvals by HODs. Confirm funding, advertise, evaluate, award, go to site. Follow procurement procedures up to Contractor taking site. All through consultation across the board within consultative members with design members. Consultation continues with Client. Fad of going for retreat with all sake holders to a firm brief, the design and overall documentation to reduce time.
09	KIA	Administrator	Director Human Resource and Administration	20 years in coordination of administration and human resources functions, project liaison officer for development project + 1 year provincial administration coordinating security and other government functions	Identify need such as a shortage of class through a business process i.e demand more than facilities available. Planning committee set comprising of lecturers and head of sections. Works out what is to be housed in building and lists of requirement such as number of classrooms, necessity of library, offices, additional facilities etc. Options of provisions eg lift instead of ramp. Skill of project vis a vis costing e.g. for the tuition block, dining auditorium and kitchen were scaled out for costing reasons. These items were later included in the hostel block. On finalizing brief, MOPW called in. Brief given to team. Designs undertaken. Drawings develop and estimates given. Estimates presented to management for approval. Thereafter to the council for approval and advice. After council approval proceed for detailed drawings. Generate BOQs, advertise for 21 days open bids, and evaluate bids, present to tender committee to award contract. Aforementioned takes approximately one year for big project. After identification project budgeted for within processes of budgeting.
10	NYS	Senior Technician Building construction	Senior Superintending buildings	5 years-coordinating of construction projects, liaison officer	User unit commanders propose project e.g dining barracks due to congestion. He meets with the director and the finance officer. The planning unit assess whether project viable. Approval by the service commander. The liaison office takes over. Writes to Works (WS or CA). Team sent to inspect site. Give architectural drawings and estimated cost. If accomodatable confirm funding. Proceed with BOQs and proceed with procurement of works within laid down regulations. Advertise for 21 days (Ministry of Works or Client advertises for 21days). Return bids, evaluation by Client, Client PS appoints evaluation team with PS Works nominating technical team. Evaluation for 2 weeks depending on

					complexity. Recommendations sent to accounting officer (AO) for main and subcontractors. Then forwarded to MTC for adjudication and awarding usually as per the evaluation recommendations. Notification is sent to winning Contractor with notification of 14 day appeal period. Confirmation of acceptance by Contractor. If no appeal Contractor is invited to sign contract. AO writes to CA to take charge of the supervision of project. Contractor informed to liase with the project manager (CA) in all matters relating to the project. PM sets date for site handover and writes to Contractor and Client. Site is handed over to Contractor. Two weeks mobilization for machinery, site office allowed. Works begin.
11	MOPW	Architect	PSA/Project Manager	30 years-Design, supervision and coordination of project	Request from Client, advise Client on his request, whether the site is available and ownership of site. If budgetary provision / limitation to access whether project will take off. Happens a lot that projects do not. Project confirmed and included in annual works programme. Design team formed, site visit, data collection, site conditions. Any limitations from local government. Existing facilities. Agree on brief, confirm brief, commence on designs. Initial proposals and distribute drawings to other consultants. Develop scheme designs, obtain approvals with Client and financiers if external. develop detailed designs for all consultants and BOQs. When bills ready, design team, discusses with Client to confirm contents and budget to ensure what in bills is per Client requirements. Agree on method of tendering i.e open or restrictive. Whether advertising by Client or Ministry and who meets the cost of documentation and tender. Advertise, appoint opening committee. Open tenders; appoint evaluation committee to include procuring entities. Evaluate and propose the winning bid. Forward to procuring entity. Tender board for award, if tender board concurs with evaluation team, if not concurred with, cancellation or repeat evaluation, issue letters of acceptance and await appeal. If no appeal, signing of contracts by procurement entity. If MOPW appointed as PM, organise for handing over of site. Contractor takes possession of site and works begin.

12	TSC	Administration Teacher	Deputy Director	12 years - in charge of training, human training, liaison officer for TSC, construction + 3 years D.E.O, coordinating education matters + 8 years teaching + 4 years education officer	Prioritizing by Client, identify the project, identify site, what appearance of building, address costing, what is the cost? Plans and drawings, approvals, identify consultants or engage MOPW. Confirm funding. Tendering, advertise for tenders, receive tenders, evaluate the tenders within procedures, award, no complications, and Contractor takes possession of site.
13	SSMB	Sports Administrator	Project Officer	2 years-coordination of construction projects + 5 years teaching + 13 years coordination sports activities + 3 years managing Nyayo Stadium	Development of proposal, feasibility study, request for funding from govt. or development partner, benchmarking examination, research activities, production of designs, approval of designs, tendering as per procedures, Contractors goes to site.
14	MOPH	Health Administrator	Senior Assistant Chief Health Administrator	22 years- coordination of development projects	There are two kinds of projects. GOK funded and Donor funded. Upgrading / expansion or new facility. Need based, look at data if upgrade, volume of people, work load vis-à-vis the facilities being offered, referral system, catchment area, health management system, disease pattern, which diseases, which area, situational analysis, appraisal and feasibility, capture in MTEF, design by MOPW / Consultants. Decide what is needed and scope. Design specifications, contract by MOPW, tendering process as per regulations. Received bids, evaluation, recommendation, MTB for award, contract, and contactor on site.
15	POLICE	Police Officer	Director of planning	9 years-planning and development of construction projects, establishment and	Need presented to commissioner and senior police who give input and confirm the need. Police service generates large number of projects in government. MOPW overwhelmed on supervision. User conceives ideas of need of project at a specific police station. Station A requires housing or police station. Once

				gazetement of police stations, identification and gazetement of police land, +15 years, general police duty	conceived and approved funding confirmed. Request MOPW for documentation preparation. MOPW sends for approval and uncosted bid documents for Client to own document. Once confirmed go ahead given to prepare documents for sale. Site survey done and other documents prior to preparation of bid documents. Client informed that bid documents are ready and the way forward on procurement sought for the works. Two options MOPW advertises or documents taken to police to advertise with draft advert. Advertise. Opened in presence of MOPW, Client and bids forwarded to MOPW for technical evaluation within a specific period of evaluation and return to Client with recommendations with most responsive bidders 1,2 and 3 who are qualified. When back to Client, departmental procurement committee seats at police headquarters deliberates on recommendations, checks on correctness of recommendation, confirms or reviews with reasons. Once satisfied MTC at OP with police department represented by administration secretary, CFO and police CPO. Recommendations adjudicated, discussed and awarded if satisfactory. Communications to commissioner of police with information of award and go ahead for further processes. Administration secretary informs winning bidder of award. Appeal period of 14 days and if no appeal winning bidder is called upon to submit performance bond and unsuccessful bidders notified of results. Plan for handing over of site to Contractor. Date of handing over determined by Client and Project Manager MOPW. Hand over site, Contractor moves to site and work commences.
16	MOPW	Architect	PSA/Project Manager	26 Years-Design, supervision and coordination of projects	Brief from Client. Statement of requirement. Visit site to familiarize with site. Get to know physical features, existing structures, existing vegetation, topography, idea about geotechnical map out of area, geotechnical test. Develop Client brief. Same time indicates need to incorporate other disciplines. Presentation of outline proposals to Client. Design team on board. Design meetings to look at aspects of projects which should include EIA expert report. Keep developing the project sketch design. Take sketches, estimate and programme to Client for approval. Liaison with CA for approval of sketches.

					Once approved by Clients, prepare production drawings, project details, schedules by all consultants. Circulate to all team members for preparation of tender documents. Tender documents should be circulated but not done due to urgency. Circulated for all team members to check that all is in order. Tender documents checked and forwarded to Client department to initiate tender action with draft advertisement if in category of advertising. If for short listing with shortlisted bidders for relevant entity to approve for bidding. Upon expiry of 21 days of submission of tenders, tenders opened and MOPW representative attend opening. Evaluation team constituted by Client with nominations from MOPW. Evaluations completed and signed. MTC adjudicate and awards after award letter of acceptance sent to Contractor. Signing of contract after expiry of 14 days appeal period on provision of valid performance bond. Pre contract meeting after signing of contract. Agenda of meeting includes outstanding matters that affect smooth handing over of the site to the Contractors and ways established to sort these. MOPW does not deal with project identification of feasibility study and appraisal. Approval by local authority usually not done but authority notified for record purposes.
17	MOPW	Architect	PSA/Project Manager	25 Years-Design, supervision and coordination of projects	Conception of project. Project brief. Availability of land / space (partitioning). Feeling of PSS forms by Client with MOPW guidance. Get budget, what Client want to spend and if available. Constitute a design team, site visit, site analysis and design. Architect undertakes preliminary design and QSs gives estimates. Presentation to Client of design and estimate for approval and advice. Scheme designs presented to Client for approval with further estimate. Design team moves together in design after the preliminary approvals. Final drawings and documentation i.e working drawings and BOQs. Advice on procurement, procure through advertising and restricted tendering or pre qualification. Pre tender site visit sometimes undertaken. Open tender, evaluate and award, prepare contract document with necessary attachments, i.e performance bonds, work programme, signing arrangements if no appeal, pre contract site meeting. Head to site.

18	MOPW	Architect	PSA/Project Manager	25 Years-Design, supervision and coordination of projects	Getting project brief from Client. Understand what they want and requirements. Where is the site. Whether they have clear understanding of processes eg laboratory so as to help in design. Client identifies site, visit the site to generally understand it. Topo survey if not done before. Process of design, preliminary designs. Client thinks of project not looking at benefit. Over ambitious projects. Go through project with Client to confirm whether that is what they want. e.g. Shimoni and Loitoktok finished with no people to occupy. Kibish in the middle of nowhere, misplaced, no people, 50 people in the neighbourhood. Preliminary design to intepret briefs, to build forms and layouts to show Client in terms of spaces. Present to the Client for them to understand. Give indication of costing. If cost beyond budget, rationalize project to fit budget. Explain reasons why costs high and rationalize. Progress to detail designs, finishes, fittings, services and go through with Client for appreciation of quality of spaces. Meantime apply for NEMA approvals, local authority and local association. eg Karengata. If special requirements adjust drawings. Proceed to final costing if high reduce specifications to suit budget. Prepare tender documents, tendering either open prequalification, restricted, and evaluation to get the more suitable Contractor. Once identified, commence works. Not done here, give a tentative programme to work out on cash flows and be ready on funding.
19	MHE	Production Engineer	Deputy Director Technical Education	8 Years-Project Manager of 2 donor projects +4 year Provincial Technical Training +15 years polytechnic lecturer	General description of need. Purpose of structure. Requirement of no. of people to be accommodated and type and quantity of equipment. Out of this assessment put general specifications and terms of reference. Terms of reference of designer, description scope of project after defining objective. Institutions determines infrastructure, buildings and services. Buildings as per use i.e. classrooms no. of students, specifications of classroom. Determine architectural design; decide sizes of rooms contained in terms of reference of designs attach a detailed brief description of work to be done. Advertise for consultants, decision involves MOPW in evaluating, tender committee to award consultants. Consultants awarded, sign contract with consultants. Take consultants to site, Develop survey drawings and establish topography of land. Start preliminary

					designs, include input of Client, suggestions and corrections to consultants, and make good suggestions. Produce architectural drawings with a perspective of actual appearance. Specifications to show landscaping and walkways and car parks for the whole site. If the drawings accepted engineers come in and produce drawings MOPW approve all these, once approved, develop Bills of Quantities. Consultants help development of Bidding documents, BOQs approved by MOPW, advertise for Contractors, open bids, evaluate, award, sign contract. Handing over of site to the Contractor where consultants describe the roles and obligations of all parties who include Contractor, Clients, consultants and MOPW.
20	MMS	Health Administrator	Chief Health Administration Officer	29 years-coordination of hospital administration and project implementation	Establish need e.g. what kind of hospital. Prepare project brief, all details, background of what exists, what you want to contract, allow designer to prepare drawings. Bring drawings to Client for discussion to assess whether fitting in with requirement. Do amendments and finalise documents. Estimates expected, worked from bills of quantities, to tender and procure a Contractor. Undertake usual tendering. Decide methods of tender, whether open or selective. Evaluate and award, prepare contract between Client and Contractor. Sign contract. Contractor given period to mobilise and go to site.
21	KERRA	Engineer	Manager Construction	3 years-Manager road project and Liaison officer and coordinating for building works	Identify need and Clients requirement, work out the estimate and undertake budgetary process. Arch designs options based on available budget sought from MOPW. Proposals taken to board for approval. Detailed designs are prepared for construction works and procurement for supervision. Implementation after procedural procurement. Go to site. MOPW undertakes supervision. For donor projects, need identified, estimates and requirements and the number of personnel to be accommodated. Identify plot, lease from Kenya Airport Authority. Preliminaries done by MOPW. TOR for design consultants. The two approved by financiers after commence. Client with MOPW prepares draft designs and requests for proposals for consultants. Consultant procured according to laid down procedures. Consultants finalised designs and tender

					documents and thereafter the project is tendered within procurement procedures.
22	OP	Administrator	Deputy Secretary	6 years-Liaison officer for development projects, budgeting and responding to audit queries + 15 years provincial administration, coordination of security and government services	Identify need by the user eg creating offices for the PA and those who support the PC. Documentation by MOPW. BOQs. Source of funds by requesting HQs for funds. Difficult to source for funds if no documents. MTEF budget process by making requests to Treasury to allocate funds for project. Factor in printed estimate, issue AIEs to implementing officers. User initiate tendering process and award using provided procedures. Once awarded, monitoring and evaluation. For rehabilitation works identify source of funds. Advertise for works. Open evaluate and award works. Prepare contract documents and sign documents.
23	MOPW	Administrator	Senior Deputy Secretary	1 year-General administration including office planning and allocation + 20 years Provincial administration ,administration police, prisons, coordinating and implementing policy, conceptualisation of programs and projects	Conceptualise need and components which would constitute a building e.g Guard room, barracks, gates, roads, civil works. Contact MOPW, get indication of cost from Works, propose budget, and introduce to Treasury to be included in development allocation through Client Ministry. Ask MOPW to prepare plans. Give quantities and more accurate budget. Funds confirmed. Adverts for bidders using usual procedures of procurement by MOPW up to the stage of having Contractor on site.
24	KIBT	Trainer of Business Management	Principal / Director	16 years - coordinating training and infrastructure for training. Policy formulation for training enterprise. Administration and	Need based on institutional mandate and vision. Vision is to be a centre of excellence in entrepreneurship and management development. The mandate is to promote SMEs in terms of training and imparting skills. Too expensive to run programmes on rented facilities. Income generation from leased space, conference facilities and amphitheatre. Get facilities to offer quality services with all facilities, as old buildings did not have adequate facilities. Facilities to accommodate staff. Advantage of available government plot at an ideal location

				management role + 4 years in the Ministry of Youth, Deputy Director, in youth employment and enterprise development, development of youth programs, in charge of youth enterprises and link person with youth fund.	from city centre. Focal point for coordination of services including research. Entrepreneur culture in our society to move from white color jobs to self employed. Negative Attitude to self employment. Have satellite programs linking local with international and built facility to provide this. Studies done to ascertain viability since this is GOK funding. Stake holders interviewed i.e from institution and PS trade. Only institution of its kind in the whole republic. Ministry of finance for financing, MOPW for estimates, confirmation of funds. Give proper brief to MOPW, design, estimate, guide for other requirement from MOPW, preliminary drawings, estimates, approval by PS Trade and MOPW, detailed designs and BOQs, confirm availability of funds, standard procedure of tendering.

Appendix 6 – Sample of Interview Concept

INTERVIEW CONCEPTS - DATA ORGANIZATION (BIO DATA + Q1)					
PROJECT INCEPTION					
	ORGANIZATION	**PROFESSION**	**DESIGNATION**	**EXPERIENCE**	**Q1-Preconstruction planning Process**
01	MOPW	Architect	PSA/Project Manager	26 Years-Design, supervision and coordination of project	Design team / Client consultation and coordination. Brief formulation. Stakeholders coordination. Process advice to Client. Stakeholders, involvement and advice. Stakeholders identification i.e design team, users. Design team inputs i.e designs and documentation. Estimates.
02	MOPW	Architect	PSA/Project Manager	30 Years-Design, supervision and coordination of project	Brief formulation, site survey and investigation. Design and documentation. Tendering process.
03	MOPW	Architect	PSA/Project Manager	18 Years-Design, supervision and coordination of project	Need identification by Client. Project submission to MOPW. Brief formulation. Design team / Client consultation. Site survey and investigation. Program preparation. Preliminary designs. Preliminary estimates. Clients approvals of preliminary designs and estimates. Design team inputs i.e designs and documentation. Project team consultation and coordination. Feasibility study on project. Detailed design. Procurement plan. Tender process as per regulation. Contract signing. Preconstruction meeting
04	MOPW	Architect	SPSA/Project Manager	27 Years-Design, supervision and coordination of project	Submit project to MOPW. Process duly filled PSS. Funds confirmation by Clients. Brief formulation. Design team / Client consultation. Process advice to Client. Site survey and investigation. Project team consultation and coordination. Internal all consultants design approvals. Client approvals of designs. Designs crucial. Design and documentation. Preparation of specifications and BOQs. . Client approves site plan. Procurement plan / open tender ideal. Tender processes per regulation. Site handover. Contract signing on provision of performance bond. Insurance arrangement. Project Manager calls for pre contract meeting.

05	MOPW	Architect	PSA/Project Manager	28 Years-Design, supervision and coordination of project	Brief formulation. Site survey and investigation. Preliminary designs. Constitute design team. Detailed design and documentation. Tendering process as per regulations. .Handing over of site.
06	MOHA	Administrator	Deputy Secretary	Present 6 years-Monitoring implementation of project development + 20 years, security matters and coordination of government activities	Need identification by Client. Client internal consultations. Brief formulation within Client. Request for funds. Submit project to MOPW. Constitutes design team. Develop estimates. Seek funds from treasury. Budget in printed estimates. Tendering process as per regulation. Site handing over.
07	MOBE	Educationist	Assistant Director	10 years-Management and administration of primary teachers training colleges, recruiting trainees and supervising non teaching staff + 6 years in Quality assurance and inspectorate for standards of education and infrastructure	Project funding. Confirm funds. Need identification by community. Strategic objective. National policy. Seek funds from treasury. Budget in printed estimates. Release funds to user. Stakeholders identification and involvement. Client / design team consultation and coordination. Develop designs. Client E & M.
08	MOPW	Architect	SPSA/Project Manager	17 Years-Design, supervision and coordination of project + 3 years project manager for medical services infrastructure	Submission of projects to MOPW. Process duly filled PSS's. Constitute design team. Develop preliminary designs. Preliminary design approval by Client. Site survey and investigations. Brief formulation. Design team input, designs. Internal approvals by MOPW HOD's. Confirm funding. Tender process as per regulation. Stakeholders forum to confirm brief. Stakeholders involvement and consultation.
09	KIA	Administrator	Director Human Resource and Administration	20 years in coordination of administration and human resources functions, project liaison officer for development project + 1 year provincial administration coordinating security and other government functions	Need identification by Client. Strategic plan. Identify asset gap. Project budgeting. Factor in printed estimates. Constitute Client project team. Client internal consultations. Brief formulation by Client. Value engineering process. Project prioritizing. Submit project to MOPW. Constitute design team. Develop designs. Develop estimates. Client approval of estimates. Develop detail design. Prepare BOQs. Tender process as per regulation. Duration of PCP is 1 year.
10	NYS	Senior Technician Building construction	Senior Superintending buildings	5 years-coordinating of construction projects, liaison officer	Need identification by Client. Asset gap. Client internal consultations. Feasibility study. Strategic objective. Liaison office takes over project. Submit project to MOPW. Constitute design team. Site survey and investigations. Develop designs. Develop estimates. Client approval of designs. Client approval of estimates. Confirm funds. Prepare BOQs. Tendering process as per regulations. Client appoints project manager. Instructions to the Contractor to liaise with the project manager on project. Site handing over. Moblisation by Contractor. Commence works.

11	MOPW	Architect	PSA/Project Manager	30 years-Design, supervision and coordination of project	Submit project to MOPW. Advise Client. Confirm availability of site. Confirm budget. Confirm project implementation. Include project in annual works programme. Constitutes design team. Site survey and investigation. Brief formulation. Develop preliminary designs. Design team inputs, designs. Client design approvals. Financiers designs approvals. Design team inputs, develop detailed designs. Develop BOQs. Design team / Client consultation. Design tean / Client confirmation of BOQs vis a vis Clients brief. Procurement planning and method of tender and assign roles. Determine cost responsibilities on tender process. Tender process as per regulations. Client appoints project manager. Project manager organises site handing over. Site handing over. Work commences.
12	TSC	Administration Teacher	Deputy Director	12 years - in charge of training, human training, liaison officer for TSC, construction + 3 years D.E.O, coordinating education matters + 8 years teaching + 4 years education officer	Project prioritizing. Identify site. Define appearance of building. Develop estimate. Develop designs. Client approval of designs. Client approval of estimates. Constitute the design team. Seek funding. Confirm funding. Tender process as per regulation. Site handing over.
13	SSMB	Sports Administrator	Project Officer	2 years-coordination of construction projects + 5 years teaching + 13 years coordination sports activities + 3 years managing Nyayo Stadium	Identification by Client. Feasibility study. Seek funding from treasury or development partner. Benchmark proposal. Develop designs. Client approval designs. Tendering process for approval as per regulations. Site handing over.
14	MOPH	Health Administrator	Senior Assistant Chief Health Administrator	22 years- coordination of development projects	Identify project funding. Need identification by Client. Feasibility study. Factor in printed estimate. Constitute design team. Brief formulation. Develop designs. Develop specifications. Tendering process as per regulations. Site handing over. Work commences
15	POLICE	Police Officer	Director of planning	9 years-planning and development of construction projects, establishment and gazetement of police stations, identification and gazetement of police land, +15 years, general police duty	Need identification by Client. Client internal consultations. Brief formulation. Confirmed funds. Submit project to MOPW. Site visit and investigation. Develop preliminary design. Client approval of preliminary designs. Develop detailed designs. Client approval of detailed designs. Prepare tender documents. MOPW Informs Client bid documents ready. Approval of Tender documents. Tender process as per regulations. MOPW undertakes technical evaluation. User procurement committee confirms evaluation recommendations. Recommendations forwarded to MTC. Tender adjudication and award. Award decisions forwarded to user for further processing. User informs successful bidder. Contractor submits performance bond. Project manager and Client organises site handing over. Site handing over. Commence work.

16	MOPW	Architect	PSA/Project Manager	26 Years-Design, supervision and coordination of projects	Submit project to MOPW. Site visit and investigation. Brief formulation. Advise Client. Develop preliminary designs. Client approval of preliminary design. Constitute design team. Design team inputs, EIA reports. Client approval of estimates. Client approval of programme. CA's approval of preliminary sketches. Preparation of detailed drawing. Preparation of schedules. Design team inputs. Preparation of tender documents. Design team input, confirmation of tender documents. Submit tender documents to Client. Procurement planning. Tendering process as per regulations. Pre contract meetings.
17	MOPW	Architect	PSA/Project Manager	25 Years-Design, supervision and coordination of projects	Need identification by Client. Brief formulation. Availability of site. Submission of duly certified PSS forms. Seek funding. Confirm funding. Constitute a design team. Site visit and investigation. Develop preliminary designs. Develop estimates. Clients approval of designs. Client approval of estimates. Advise Client. Develop scheme designs. Client approval of scheme designs. Client approval of refined estimates. Design team inputs, after preliminary approvals. Development of working drawings and documentation. Procurement planning. Pre tender site visit. Tendering process as per the regulation. Site handing over.
18	MOPW	Architect	PSA/Project Manager	25 Years-Design, supervision and coordination of projects	Submit project to MOPW. Brief formulation. Advise Client. Site identification. Site visit and investigation. Develop preliminary designs. Feasibility studies. Develop preliminary designs. Client approval of preliminary designs. Develop preliminary estimates. Confirm funding. Rationalise preliminary designs with funding. Develop detailed designs. Seek statutory approvals, NEMA, local authority. Develop final costing. Prepare tender documents. Procurement plan. Tender process as per regulations. Prepare construction programme / cash flows. Commence works.
19	MHE	Production Engineer	Deputy Director Technical Education	8 Years-Project Manager of 2 donor projects +4 year Provincial Technical Training +15 years polytechnic lecturer	Need identification by Client.. Brief formulation. Constitute design team. Site survey and investigation. Develop preliminary designs. Design team / Client consultations. Client approval of preliminary designs. Design team inputs, drawings. MOPW HODs drawings and documentations approvals. Develop BOQs. Develop tender documents. Tender process as per regulations. Pre contract meeting. Site handing over.
20	MMS	Health Administrator	Chief Health Administration Officer	29 years-coordination of hospital administration and project implementation	Need identification by Client. Brief formulation. Submission of project to designer. Develop drawings. Client approval of drawings. Develop final documents. Develop estimates. Prepare BOQs. Procurement planning. Tender process as per regulations. Mobilisation period. Work commences.
21	KERRA	Engineer	Manager Construction	3 years-Manager road project and Liaison officer and coordinating for building works	Need identification by Client. Brief formulation. Constitute design team. Prepare estimates. Seek funding from treasury. Factor in printed estimates. Submit projects to MOPW. Develop preliminary designs. Client approval of preliminary designs. Develop detailed designs. Procure supervision team. Tender process as per regulations. Identify plot..

22	OP	Administrator	Deputy Secretary	6 years-Liaison officer for development projects, budgeting and responding to audit queries + 15 years provincial administration, coordination of security and government services	Need identification by Client. Submit project to MOPW. Preparation of BOQs. Seek funds. Factor funding in printed estimates. Confirm funding. Tender process as per regulations.
23	MOPW	Administrator	Senior Deputy Secretary	1 year-General administration including office planning and allocation + 20 years Provincial administration ,administration police, prisons, coordinating and implementing policy, conceptualisation of programs and projects	Need identification by Client. Submit project to MOPW. Preparation of estimates. Seek funding from treasury. Factor funding in printed estimates. Prepare BOQs. And refined estimates. Confirm funding. Tender process as per regulations. Site handing over. Work commences.

Appendix 7 - Sample of case study findings

	Client Liaison Officer	Project Scope	Project Cost (Kshs.)	Issues Addressed in Preconstruction Consultation	Document prepared at Preconstruction Stage	Date of Commencement	Initial Completion date	% completion	% Period Elapsed	Actual Completion Date	Reason of Delay	Remarks
1	√	Completion of Multipurpose Hall (Stalled Projects Programme)	86,883,360	• Project was a stalled self-help group project. Stalled by incompetent local Contractor. Substructure and Superstructure concrete works were complete. No roof, windows, door, finishes or services works completed. • Project was later placed under MOPW Stalled Projects Programme.	Tender documents Drawings Bills of Quantities Award letter	3/9/2008	3/092009	100	161	23/04/2010	Increase in scope of works: Demolition, changed roof structure, addtl. Beams, stairs Financial Constraints: Delay in payment Delay in appointment of subcontractors.	
2	√	Completion of the KIBT headquarters entailing, Erection of Raft foundation Basement parking 7 floor highrise block comprising of office space and hostel rooms	629,909,101	Date of Site handover and pre-contract meeting Communications channels Members of the design team Project management team Main Contractor acknowledgement of tender and confirmation of readiness	Drawings Bills of Quantities	11/03 2009	28/06/2011	31	125	4/04/2012	Stoppage of works for 26 weeks due to existing site conditions i.e change of foundation type Missing contract data in form of design details Delayed Payments and claims evaluation	The project did not complete on time and has been awarded 40 weeks extension of time from the initial completion time.

3	√	Construction of ;20 standard offices, A meeting room, A kitchen, A store, A small Library, A reception area	11,250,538	Vide a pre-contracts meeting on 22nd February,2006 Date of Site handover Works Programme Performance bond insurance bond Contract data inform of all drawings, namely Architectural, structural and Electrical and Mechanical Unpriced Bills of Quantities	Drawings Bills of Quantities	27/02/2006	22/05/2006	100	375	13/032007	Delay in issuance of contract data, namely structural drawings delayed for three weeks after change in design from masonry wall to steel sections for anchoring Delayed payments leading to poor performance by the Contractor	The project did not complete on time and was awarded a 45 weeks extension from 22nd May, 2006 to 13th March 2007 the date of practical completion. There was also a variation of 5.4% on the cost raising the final cost of project to Kshs 11,865,436.40

4	√	Dormitories, Junior Staff Quarters, Lecturers staff/Administration Staff Houses, Senior Staff Houses, Lecture Theatre, Library, Support Services Block, Classroom Blocks, Toilet Blocks, Sports Pavilion, External Works, Civil works	1,567,661,000	Survey of stalled works and buildings left abandoned Cost estimation for outstanding completion works. Reviewing and preparing drawings for all stalled buildings and making details. High Level Water Tank Steel Tower Foundation	Preliminary cost estimates Engineering drawings	15/04/2008	23/042009	100	168.75	16/12/2010	Delayed payments Late nomination of sub-Contractors Having two main Contractors work on the same site. Kenyatta University who have taken over the college have engaged another Contractor to carry out some works on the same site. Late receipt of some instructions/details from the Project Consultants.	Project Consultants have been warned that they will be held responsible for any claim arising out of delayed issuance of instructions /Project details. Contract period was extended.
5	√	Exterior Painting, Interior Painting, Construction of Ramps at Entrances,Re-partition of Basement Level, Banking Hall/Cash Office Partition and Refurbishment, Partitioning at Main Entrance and Vip Lift Lobby, Landscaping Works	22,443,432	Remind Project Team of Importance of Adherence to Procedure Handing Over Site Delays	Architectural Drawings Engineering Drawings Bills of Quantities	9/06/2011	29/09/2011	85	156.25	1/12/2011	Handing Over Site delays Design Variations, Changes in the Scope of Works,	Ongoing Works are Proceeding Smoothly

6	√	Construction of 2 no. blocks of 12 No. 2-Bedroom units each.	60,000,000	Financial Site condition Completeness of drawings Adherence to Client's brief	Drawings Bill of Quantities - Minutes	22/08/2006	13/02/2007	100 ,excluding civil works	461.90	30/09/2008	N/A	Project completed far beyond schedule
7	√	Construction of 2 no. type E flats at Dandora police station	60,000,000	Financial Site condition Completeness of drawings Adherence to Client's brief	Drawings Bill of Quantities - Minutes	22/08/2006	13/02/2007	100 excluding road works.	480.95	30th September, 2008	Failure of the Mechanical subcontractor to do the works	Project completed far beyond schedule
8	√	Completion of the three tower blocks and Prime Cost Works(plumbing and drainage, electrical installations, lift installations, structured cabling and EPABX, air conditioning, generator, security surveillance and fire detection system, kitchen equipment and gas installation)	553, 814, 934	Scope - Financial - Site condition - Completeness of drawings -Adherence to Client's brief	Drawings Bill of Quantities	17/05/2010	8/082011	71	117	26/12/2011	Late appointment of the Lifts Sub-Contractor Slow progress on the part of some sub- Contractors Late issuance of structural drawings for the executive lift shaft Additional works on lifts	Project lagging behind schedule The works are expected to be finished by end December 2011 The lifts are expected to be finished by June 2012
9	√	Builders' works, electrical and mechanical works on 15 no. Type blocks of flats	271,394,743	Scope - Financial - Site condition - Completeness of drawings -Adherence to Client's brief	Drawings Bill of Quantities	25/09/2007	25/08/2008	100	135	25/12 2011	Late appointment of the sub-Contractors Revision of scope of works Late payments Post-election violence Poor weather	Project completed and handed over to the Client

10	√	Completion of Pangani Police Lines	58, 437,626	Scope - Financial - Site condition - Completeness of drawings -Adherence to Client's brief	Bills of Quantities	24/08/ 2006	20/01/2007	90	142.04	Not known	Site Instruction for Plumbing works. SI for erection of High Level Water Tank Bases. Dumped Gravel materials from the Nairobi-Thika Highway works	Project has stalled
11	√	Completion of 595 Housing units Associated Electrical, Internal Plumbing and drainage works Foul drainage works Road works	1,371,664,442	Scope- Financial - Site condition - Completeness of drawings -Adherence to Client's brief	Bills of Quantities	5/10/2009	5/10/2011	57.50	101.90	-	Delayed appointment of subcontractors. Additional works. Delayed payments. Delayed testing of structural woks. Delayed installation of KPLC transformers	The project is expected to be completed in October 2012
12	√	2 blocks of flats each comprising 12 No. 2 bedroom flats and associated civil works	60, 411, 242	Scope - Financial - Site condition - Completeness of drawings -Adherence to Client's brief	Drawings Bills of Quantities Minutes	25/08/2006	13/02/2007	100	458	11/03/20 09	Delayed award of subcontracts Non performance by Mechanical subcontractor	Project completed, handed over & final account done
13	√	1 No. police station administration block and associated civil works	39, 714 ,418	Scope - Financial - Site condition - Completeness of drawings -Adherence to Client's brief	Drawings Bills of Quantities Minutes	25/08/2006	13/11/2008	40	-	-	Non performance by main Contractor	Contract terminated due to non performanc e, re-documente d and now awaiting Client’s approval for tender action.

14	√	Office Accommodation , Basement Parking, Restaurant	986,926,151	Feasibility study/ Needs assesment. Updating of old designs. Pre-qualification of Contractors. Re-tendering. E.I.A Assesment. Internal Communication on previous documentation. Programming vis a vis expected funding per financial year.	Architectural drawings structural drawings, electrical & mechanical drawings, BQS.	5/04/2006	1/04/2009	100	114	24/09/2009	Cash flow delays, sub-contract works delays.	Final account being checked in October 2011.
15	√	Flats, Double Span Kitchen & Dining, Barracks and Associated Civil Works.	104,050,589	Evaluation of stalled structures. Brief Formulation / Scope of works Short listing of Contractors. Tender Evaluation. Award of Contract.	Architectural drawings Structural drawings Electrical & Mechanical drawings BQs.	1/10/2007	12/10/2008	100	158	Partial practical completion 13th May 2009	Cash flow delays sub-contract works delays post-election skirmishes.	Complete, handed over. Final accounts in progress.
16	√	60 units	170, 202,307	Site surveys, Brief development. Reviewing progress of documentation, roles and responsibilities of parties to the contract:	Site plan Architectural and specialist drawings Bills of Quantities	29/08/2006	28/08/2007	100	416	27/10/2010	Relocation of some buildings Delays in awarding, Sub-contract works, delays in payments Delays in finalising compensation claims Delays in commencement of civil works	Project completed late, in use and final account in progress at advanced stage

17	√	20 NO. , 2 BEDROOM UNITS	47,055,395	Site surveys, Brief development, Reviewing progress of documentation, roles and responsibilities of parties to the contract:	Site plans Architectural and specialist drawings Bills of Quantities	1/08/2006	11/04/2007	100	350	Partial 5th January, 2009	Shortage of Water on Site Delays in awarding Sub-contract works Delays in payments Sluggish performance by sub-Contractors.	Complete and Accounts Finalised
18	√	50 NO. 2 BEDROOM UNITS	198, 159,360	Development of Client Briefs, Review progress of documentation, site surveys, Spelling out roles and responsibilities of the parties involved in the implementation.	Site plans Architectural and specialist drawings, Bills of Quantities Topo Maps	13/09/2006	12/09/2007	85	157	On-going	Delays in awarding Sub-contract works, delays in payments Delays in finalising compensation claims election skirmishes Sluggish performance by Contractors.	Duplexes complete and handed over on 11th October, 2011.
19	√	Builders works, water Piping renewal, plumbing and drainage, electrical works, air conditioning works and heating system covering: The Stadium The gymnasium Swimming pool and Athletes' dormitory/accommodation	1,078,710,000	Negotiation meetings between Sports Stadia Management Board, Chinese government and Ministry of Foreign Affairs Survey of existing facilities Need assessment report Refurbishment drawings and specifications. Refurbishment agreement between Chinese government and Kenya government.	Drawings prepared by M/s China South West Architectural Design and Research Institute No Bill Of Quantities contract agreement signed between the Contractor M/s Shengli Engineering Construction Company Limited and the Permanent Secretary – Ministry of Youth Affairs and Sports for	6/08/2010	6/08/2011	86	117	On-going	laying off of workers Extra works requested by Client	The Ministry of Youth Affairs and Sports / Sports stadia Management Board did not involve the MOPW up to when 50% of the works had been undertaken. There after MOPW team has not been actively involved in supervision

					the Government of Kenya (Client)							other than a clerk of works assigned to the project.
20	√	2 bedroomed bungalow, with a strongroom and a carwash area/bay and associated mechanical and electrical works.	8,692,657	Scope Confirmation of availability of funds Name of project Priority of the project.	Drawings Bill of Quantities	28/02/2011	12/09/2011	70	121	Awaiting the application of the extension of time from the Main Contractor.	Slow progress on the part of the Main Contractor.	Project lagging behind schedule. Main Contractor issued with a default notice.
21	√	3200m2 two storeyed tuition block with a lift, 5No. Lecture rooms with breakaway areas, 1No. Business centre, Library/Resource centre, Kitchenette, ablution Block and landscaped courtyard.	209,497,019	Scope Confirmation of availability of funds Name of project Priority of the project.	Architectural, civil, structural ,electrical, mechanical and landscaping drawings, Bill of Quantities	26/06/2009	26/06/2010	100	175	31/03/2011	Extra works on the substructure Delay in acquiring of alluminium sections for the windows in the market Delay in the importation of the lift cabin Discolouring of the Byramix application on the external walls. Slow progress by the Main Contractor at 80% completion.	Steady and remarkable progress upto 80% completion Six months delay was at 80% to completion

22	√	-Completion of Builder's works and Civil works -Supply, Installation &Commissioning of Cold room Equipment for the Morgue	13,125,779	Review of progress Discussing challenges and issues	Drawings Bills of Quantities Documentation Schedule	4/11/2010	20/04/2011	100	100	N/A	NA	NA
23	√	-Completion of Builder's works and Civil works -Installation of Kitchen Equipment, Laundry Equipment and LP Gas -Solar installations - 350 KVA Stand-by Generator installations	196,927,909	Review of progress Discussing challenges and issues	Drawings Bills of Quantities Documentation Schedule	21/10/2008	20/04/2010	75	198	Incomplete	Delayed Appointment of Sub-Contractors	
24	√	Completion of X-ray block Refurbishment of Female & Male Wards, Main Theatre and Staff houses Civil and Road works to the Morgue	53,151,060	Review of progress Discussing challenges and issues	Drawings Bills of Quantities Documentation Schedule	18/08/2010	2/02/2011	100	150	24/04/2011	Delayed Payment	
25	√	Partitioning of 6 floors, Blue Shield Towers Building	76,606,453		Construction Drawings,Plans, Sections and Elevations, Bills of Quantities	6/09/2010	31/01/2011	100	215	18/072011	Stoppage of the works by the Client and the landlord due to unavoidable circumstances.	

26	√	Completion of builders works, Civil works, Electrical Installation, PABX Installation, Mechanical Works, Borehole Installation, Supply, installation and commissioning of kitchen equipment, Cold room and ventilation, interior design Works, Landscaping works	383,066,066	Design Team Meeting Design Team Visit to site Submission of designs and drawings Compiled B.Q's meeting Pre-Contract Meeting Site handing over meeting	Drawings Bills of Quantities Documentation Schedule	21/09/2009	7/06/2010	85	91	13/12/2011	Delays in payments Inclusion of additional works	

Appendix 8 – Data analysis output with Nvivo

	INTERVIEWS SCHEDULES																								
Concepts	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**Frequency**
Q 1																									
(1 1)	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	1	**6**
(1 2)	1	0	1	1	1	1	1	1	1	0		0	0	0	0	1	0	0	1	0	0	0	0	0	**11**
(1 3)	1	1	1	1	1	1	0	1	1	0	1	1	0	1	1	1	1	1	1	1	1	0	0	1	**19**
(1 4)	1	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**5**
(1 5)	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**3**
(1 6)	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
(1 6 1)	0	0	1	0	1	0	0	1	0	0	1	0	0	0	1	1	1	1	1	1	1	0	1	1	**13**
(1 6 2)	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	**21**
(1 6 3)	1	0	1	0	0	1	0	0	1	1	0	1	0	0	0	0	1	1	0	1	1	0	2	1	**13**
(1 6 4)																									
(1 6 4 1)	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	2	**22**
(1 6 4 2)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
(1 6 4 3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**1**
(1 6 4 4)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	**1**
(1 6 4 5)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	**3**
(1 6 5)	0	0	0	0	1	1	0	1	1	1	1	1	0	1	1	1	1	0	1	0	1	0	0	0	**13**
(1 6 6)	0	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	1	1	1	0	1	1	0	**9**
(1 6 7)	1	0	1	1	0	1	0	1	0	0	1	0	0	0	0	1	1	0	1	0	0	0	0	0	**9**
(1 7)	0	1	1	1	1	0	0	1	0	1	1	0	0	0	1	1	1	1	1	0	0	1	0	0	**13**
(1 8)	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	**3**
(1 9)	0	0	1	0	0	1	1	0	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	**17**
(1 10)	0	0	1	1	0	1	0	1	1	1	1	0	0	0	1	1	0	1	0	1	1	1	1	1	**15**

(1 11)	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	**4**
(1 12)	0	0	1	0	0	0	0	0	1	1	0	1	1	1	0	1	0	0	0	0	0	0	0	1	**8**
(1 13)	0	0	0	1	1	1	0	0	1	1	1	1	1	1	1	0	1	0	1	0	0	0	1	0	**13**
(1 14)																									
(1 14 1)	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	1	1	0	0	0	**8**
(1 14 2)	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	**4**
(1 14 3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	**4**
(1 14 8)	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	**23**
(1 15)	0	0	1	0	0	1	1	0	1	0	0	1	1	1	0	0	1	0	0	1	1	1	1	1	**13**
(1 16)	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	**3**
(1 17)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	**2**
(1 18)	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	0	0	1	0	0	0	**5**
(1 19)	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	1	0	1	0	0	1	0	**7**
(1 20)	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
(1 21)	0	0	0	1	0	0	1	1	0	1	1	1	0	0	1	0	1	1	0	0	1	1	1	1	**13**
Q 2																									
(2 1)	1	0	1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	3	1	**23**
(2 2)																									
(2 2 1)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	**3**
(2 2 2)	1	0	0	0	0	0	1	1	0	1	0	0	0	1	0	0	0	0	1	1	1	1	0	1	**10**
(2 2 3)	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	0	1	1	1	1	0	1	1	**11**
(2 2 4)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	**2**
(2 2 5)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	**2**
(2 2 6)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	**2**

(2 2 11)	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	1	1	0	0	0	0	1	0	1	**8**
(2 6)	1	1	1	0	0	0	1	0	1	1	1	0	0	1	0	1	1	1	1	1	1	0	0	0	**14**
(2 8)	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	0	1	1	0	0	**18**
(2 8 1)	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	1	1	1	1	0	1	**8**
(2 8 3)	1	0	0	0	0	0	1	0	0	1	0	1	0	1	1	0	1	1	0	1	1	0	0	0	**10**
(2 8 7)	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	1	0	**7**
(2 8 10)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	**24**
(2 9)	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	0	0	0	0	0	**17**
(2 12)	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0	1	1	1	0	0	1	1	0	0	**9**
(2 13)	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	**23**
(2 13 4)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
(2 13 5)	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
(2 14)	0	0	1	0	1	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**5**
Q 3																									
(3 1)	1	1	1	0	1	0	1	0	1	1	1	0	1	1	0	0	0	0	1	0	1	1	1	1	**15**
(3 2)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	**24**
(3 3)	1	1	1	0	1	0	0	0	1	0	1	0	1	1	0	0	0	0	0	1	1	0	1	1	**12**
(3 4)	1	0	0	0	0	1	0	0	0	0	0	0	1	1	1	0	0	0	0	1	0	0	0	1	**7**
(3 5)	0	0	1	0	1	1	0	0	1	1	1	0	1	0	0	0	0	0	0	0	1	0	1	0	**9**
(3 6)	0	0	1	0	0	0	0	1	1	0	0	0	1	1	0	0	0	1	1	0	0	0	0	1	**8**
(3 7)	0	0	0	0	1	1	1	1	0	1	0	0	0	1	1	0	0	1	0	1	0	0	1	1	**11**
(3 8)	0	0	0	0	1	0	1	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	**6**
(3 9)	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	1	0	0	0	**4**
(3 10)	0	0	0	1	1	0	0	1	1	0	1	1	0	1	0	1	0	1	0	0	0	0	0	1	**10**
(4)																									
(4 1)	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	**4**
(4 2)																									
(4 2 1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	**1**
(4 2 2)	1	1	1	1	1	0	1	1	2	0	0	0	1	0	0	1	0	0	1	0	1	0	0	1	**14**
(4 2 3)	1	1	1	1	0	0	0	1	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	**8**

(4 2 4)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	**1**
(4 2 7)	0	4	1	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	**9**
(4 2 8)	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	**22**
(4 4)	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	0	1	1	0	0	1	1	1	**21**
(4 5)	0	0	1	1	1	0	0	0	0	1	0	0	0	0	1	1	0	1	0	0	0	0	1	1	**9**
(4 6)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	**2**
(4 7)	0	0	1	0	0	0	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	**5**
(4 9)	1	0	0	1	1	0	1	0	0	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	**8**
(4 10)	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	**4**
(4 11)	0	0	1	1	0	1	0	0	1	0	1	0	1	1	0	0	0	1	0	1	1	0	1	0	**11**
(4 12)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	**3**
(4 13)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	**4**
(4 13 1)	0	0	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	**4**
(4 13 2)	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	**2**
(4 13 10)	0	1	0	0	1	0	0	1	1	0	1	0	0	0	0	0	1	0	1	0	1	0	0	0	**8**
(4 13 12)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	**3**
Q 6																									
(5 1)	1	0	1	0	0	0	0	1	0	1	0	0	0	0	1	1	1	1	0	1	0	1	0	1	**11**
(5 2)	1	0	0	0	0	0	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	1	0	0	**6**
(5 3)	1	0	1	1	0	0	1	1	0	1	1	0	1	1	1	0	1	0	0	1	1	0	1	0	**14**
(5 4)	1	1	0	1	1	0	0	0	0	1	0	0	1	1	1	0	1	0	0	0	0	0	1	0	**10**
(5 5)	1	1	1	0	0	0	1	1	0	0	1	1	1	0	1	1	1	1	0	1	0	1	0	1	**15**
(5 6)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**2**
(5 7)	0	1	0	1	1	1	0	1	1	0	1	1	1	0	1	1	1	1	0	0	1	0	1	1	**16**
(5 8)	0	0	0	1	1	1	0	1	0	0	1	0	0	0	1	1	1	1	1	1	1	1	1	1	**15**
(5 9)	1	1	0	0	1	0	0	1	0	0	0	0	1	0	1	1	1	0	0	0	0	1	1	1	**11**
(5 10)	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	**6**
(5 11)	0	1	1	1	0	1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	**14**
(5 12)	0	1	1	1	1	0	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	**8**
(5 13)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**2**

(5 14)	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	**5**
(5 15)	0	1	1	1	1	0	0	1	1	0	1	0	0	0	1	1	1	0	1	1	0	1	1	0	**14**
Non tech	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	**5**
Q 7																									
(6 1)	1	1	1	1	1	1	0	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	**20**
(6 2)	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	0	1	**21**
(6 3)	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	1	**6**
(6 4)	1	1	1	1	0	0	0	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	**18**
(6 5)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	**24**
(6 6)	1	0	1	1	0	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	**19**
(6 7)	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	**4**
(6 8)	0	0	0	1	0	0	0	1	0	0	1	0	1	1	0	0	1	0	0	0	0	0	0	1	**7**
(6 9)	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	**3**
(6 10)	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
(6 11)	0	1	0	0	1	0	1	0	0	1	0	1	0	1	0	0	1	0	1	1	1	0	0	1	**11**
(6 12)	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	1	1	1	0	0	0	**7**
(6 13)	0	0	0	1	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**4**
(6 14)	1	1	0	1	0	0	0	1	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	**7**
(6 15)	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	**5**
(6 16)	0	0	0	0	1	0	0	0	0	0	0	1	1	0	1	0	0	0	1	1	0	0	0	0	**6**
Q 10																									
(7 1)	1	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	0	**7**
(7 2)	1	0	1	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	**8**
(7 3)	1	1	1	1	0	0	0	1	0	1	1	1	0	1	1	0	1	1	0	0	0	1	0	0	**13**
(7 4)	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	1	0	0	**7**
(7 5)	0	1	1	0	1	0	0	1	1	1	0	1	0	0	1	0	0	1	0	1	0	1	0	0	**11**
(7 6)	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	**3**
(7 7)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
(7 8)	0	0	1	0	1	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	**7**
(7 9)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**

(7 10)	1	0	0	0	0	0	0	1	0	1	0	1	1	0	1	0	1	1	0	0	1	0	0	0	**9**
(7 11)	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	**3**
(7 12)	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**2**
(7 13)	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	**2**
(7 14)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	**2**
(7 15)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**1**
Q 11																									
(8 1)	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	**22**
(8 2)	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
(8 3)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	**23**
(8 4)	1	1	0	1	0	1	1	1	1	0	1	1	1	0	0	0	1	0	1	1	1	1	1	1	**18**
(8 5)	1	1	1	1	1	0	1	1	0	0	1	0	1	1	0	1	1	1	0	1	1	1	0	0	**21**
(8 6)	1	1	1	1	1	0	1	1	1	1	1	0	0	1	0	1	0	0	0	0	0	1	0	1	**14**
(8 7)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	**24**
(8 8)	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	**3**
(8 9)	1	0	0	1	0	0	1	0	1	0	1	1	0	1	1	0	1	0	0	0	0	0	0	0	**9**
(8 10)	1	0	0	1	0	0	0	1	0	0	1	1	0	0	1	0	1	1	1	0	0	0	0	0	**9**
(8 11)	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	0	1	1	1	**20**
(8 12)	0	1	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	**5**
(8 13)	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	**5**
(8 14)	0	1	1	0	0	0	0	1	0	0	0	1	0	0	1	1	1	1	0	0	1	1	0	0	**10**
(8 15)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**2**
(8 16)	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	**4**
(8 17)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
(8 18)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	**2**
(8 19)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	**1**
(8 20)	0	0	1	0	0	0	0	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	**5**
Q 12																									
(9 1)	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**4**
(9 2)	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	1	**6**

(9 3)	1	0	0	1	1	1	0	1	0	1	1	1	0	1	0	1	0	1	0	0	0	1	0	0	**12**
(9 4)	1	0	0	1	1	1	0	1	0	0	0	0	1	0	1	0	0	1	0	1	0	0	1	1	**11**
(9 5)	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	**21**
(9 6)	1	1	1	0	0	1	1	1	1	0	1	1	1	0	1	0	1	1	0	1	1	0	0	1	**16**
(9 7)	1	1	1	0	0	1	1	1	1	0	1	1	1	0	1	0	1	1	0	1	1	0	0	1	**16**
(9 8)	1	1	1	0	0	0	0	1	1	1	0	1	0	0	0	1	1	1	1	1	1	1	1	1	**16**
(9 9)	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	**3**
(9 10)	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**3**
(9 11)	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	**23**
(9 12)	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	**3**
(9 13)	0	1	0	0	0	0	0	1	0	0	1	1	1	0	1	0	1	1	0	1	0	0	1	1	**11**
(9 14)	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	**4**
(9 15)	0	0	0	0	1	1	1	1	0	0	1	0	0	1	1	1	1	1	0	1	0	0	0	0	**11**
(9 16)	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**4**
Q 13																									
(10 1)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**2**
(10 2)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
(10 3)	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
(10 4)	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	**4**
(10 5)	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
(10 6)	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	1	0	**6**
(10 7)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
(10 8)	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	**5**
(10 9)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
(10 10)	0	1	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	**18**
(10 11)	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	**3**
(10 12)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	**24**
(10 13)	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	**5**
(10 14)	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
(10 15)	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	1	0	1	**6**

(10 16)	0	0	1	1	1	1	0	0	1	1	0	0	0	0	1	0	0	1	0	1	1	0	0	0	**10**
(10 17)	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	**4**
(10 18)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**2**
(10 19)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**2**
(10 20)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**2**
(10 21)	0	0	0	0	0	1	0	1	1	1	0	1	0	0	0	0	0	1	0	0	1	0	1	0	**8**
(10 22)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
(10 23)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**1**
(10 24)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**1**

(1) Preconstruction Planning Process
(1 1) Advice to Client
(1 2) Design team/Client Consultation
(1 3) Brief formulation
(1 4) Stakeholder involvement
(1 5) Client Internal Consultations
(1 6) Design and Documentation
(1 6 1) Preliminary designs
(1 6 2) Detailed design
(1 6 3) Estimates preparation
(1 6 4) Design/Estimates approvals
(1 6 4 1) Client's approval
(1 6 4 2) Financier's approval
(1 6 4 3) CA's approval
(1 6 4 4) Statutory approval
(1 6 4 5) MOPW HODs approval
(1 6 5) Design team constitution
(1 6 6) BOQs preparations
(1 6 7) Design team input
(1 7) Site survey and investigation
(1 8) Preconstruction meeting
(1 9) Client Need Identification
(1 10) Client Need Submission
(1 11)Works Program preparation
(1 12) Feasibility study
(1 13) Site handover
(1 14) Procurement
(1 14 1) Procurement plan
(1 14 2) Contract signing
(1 14 3) Tender documents preparation
(1 14 8) Tendering process
(1 15) Seek funds
(1 16) Process PSS
(1 17) Brief confirmation
(1 18) Confirm Site availability
(1 19) Contractor Mobilize & works commence
(1 20) Project manager appointment
(1 21) Confirm funds
(2) Preconstruction plan~ Instit~ struct
(2 1) Procurement/Tendering Committee
(2 2) Client/User Project mgt committee
(2 2 1) Project confirmation
(2 2 2) Project submission
(2 2 3) Project identification
(2 2 4) Design and documentation approval
(2 2 5) Liaise with MOPW
(2 2 6) Project implementation
(2 2 11) Brief formulation
(2 6) MOPW approvals
(2 8) Client PS/Policy level
(2 8 1) Contract signing
(2 8 3) Funds confirmation
(2 8 7) Funding approval
(2 8 10) Project approval
(2 9) Project Liaison officer
(2 12) Project Manager
(2 13) Project Design team
(2 13 4) Site visit by design team
(2 13 5) Preliminary designs prepared
(2 14) MOPW Technical structure
(3) Feasibility study aspects
(3 1) Value Engineering
(3 2) Technical
(3 3) Economic
(3 4) Administration & Management
(3 5) Financial
(3 6) Environmental
(3 7) Social
(3 8) Political

(3 9) Statutory
(3 10) Risk management
(4) Documents at design & documentation
(4 1) Brief
(4 2) Designs
(4 2 1) Generic designs
(4 2 2) Preliminary designs
(4 2 3) Working drawings
(4 2 4) Model
(4 2 7) Scheme designs
(4 2 8) Drawings
(4 4) BOQs
(4 5) Estimates
(4 6) Site plan
(4 7) Works programme
(4 9) Specifications
(4 10) Concept papers
(4 11) Tender documents
(4 12) Legal docs~
(4 13) Reports
(4 13 1) Feasibility report
(4 13 2) M&E report
(4 13 10) Site analysis report
(4 13 12) EIA report
(5) Inadequate design & docu~ causes
(5 1) Inadequate time
(5 2) Inadequate planning
(5 3) Inadequate resources
(5 4) Lack of synergy project team
(5 5) Inadequate Personnel
(5 6) Non adoption of IT
(5 7) Inconclusive feasibility study
(5 8) Unclear brief
(5 9) Indisciplined officers
(5 10) High staff turnover
(5 11) Incompetent officers
(5 12) Lack of Leadership
(5 13) Demotivated staff
(5 14) Corruption
(5 15) Lack of commitment
(116) Non-Technical Client liaison officer
(6) /Effects of inadequate design & doc~
(6 1) Time overrun
(6 2) Cost overrun
(6 3) Stalled projects
(6 4) Strained relations
(6 5) Sub standard buildings
(6 6) Variations
(6 7) Inadequate consultations
(6 8) Corruption
(6 9) Lack of innovation
(6 10) Inadequate records
(6 11) Erroneous Funding Projection
(6 12) Unreliable contract sum
(6 13) Dissatisfied Clients~Stakeholders
(6 14) Negative perception on project team
(6 15) No value for money
(6 16) Project Programme change
(7) /Effect of extent of precon~ planning
(7 1) Politics
(7 2) Economic Fluctuations
(7 3) Delayed payments~release of funds
(7 4) Government policy
(7 5) Incompetent Contractors
(7 6) Variations
(7 7) Incomplete documentation
(7 8) Supply of resources
(7 9) Unique project
(7 10) Force majeure

(7 11) Stakeholders' interference
(7 12) Project management
(7 13) Client non-clarity
(7 14) Personnel
(7 15) Bureaucracy
(8) /Delays in project completion causes
(8 1) Inadequate~late release of funds
(8 2) Inadequate contract period
(8 3) long decision making process
(8 4) Poor project mgt
(8 5) inadequate pre-const~ planning
(8 6) Delayed payments
(8 7) Inadequate~incompetent personnel
(8 8) High Staff turnover
(8 9) Variations
(8 10) Unclear brief
(8 11) Incompetent Contractors
(8 12) Policy change
(8 13) Politics
(8 14) Force Majeure
(8 15) Demotivated staff
(8 16) Long procurement process
(8 17) Inavailability of site
(8 18) Disputes
(8 19) Cost overuns
(8 20) Economic fluctuations
(9) /Mitigation on project delays
(9 1) Contractors training
(9 2) Payment process
(9 3) Project Funding
(9 4) Proper Consultations
(9 5) Preconstruction planning
(9 6) Enhance capacity for Project staff
(9 7) Stiff Penalties for non-compliance
(9 8) Review staffing level~structure
(9 9) Adherance to statutory obligations
(9 10) Staff Motivation
(9 11) Project Implementation process
(9 12) Corruption alleviation
(9 13) Project Mgt structure
(9 14) Adequate time for PCP
(9 15) Review Procurement process
(9 16) Advance payment
(10) /General opinions
(10 1) Involvement of Contractor
(10 2) Review of Std form of tender
(10 3) Reintroduce former clause 2
(10 4) Empower Project Manager
(10 5) Value addition on project implementa
(10 6) Fight corruption
(10 7) Leadership patriotism
(10 8) Reform Project implemen~ structures
(10 9) Forge Synergy among technical staff
(10 10) Embrace Research & Development
(10 11) Understand Ministry mandate
(10 12) Institutionalize PCP
(10 13) Induction for new staff
(10 14) Contract period determination
(10 15) Detailed works programme
(10 16) Prompt Funding~payment
(10 17) Embrace M&E
(10 18) Stakeholders involvement
(10 19) Recruit more staff
(10 20) Eliminate delay factors
(10 21) Review procurement process
(10 22) Project prioritization
(10 23) Embrace IT
(10 24) Adhere to Statutory obligation