UNIVERSITY OF NAIROBI

COLLEGE OF ARCHITECTURE & ENGINEERING

SCHOOL OF THE BUILT ENVIRONMENT

DEPARTMENT OF REAL ESTATE & CONSTRUCTION MANAGEMENT

AN INVESTIGATION INTO THE CAUSES OF DELAYS IN GOVERNMENT HOUSING CONSTRUCTION PROJECTS: A CASE STUDY OF THE NATIONAL HOUSING CORPORATION-NAIROBI COUNTY

BY

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B04/0842/2010

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT FOR THE AWARD OF DEGREE IN BACHELOR OF REAL ESTATE AT THE UNIVERSITY OF NAIROBI

MAY, 2014
DECLARATION

I, Karanja Jack Njau, hereby declare that this project is my original work and has not been presented for the award of a degree in any University.

Signature: ........................................ Date: ........................................

KARANJA JACK NJAU

This research project has been presented for examination purposes with my approval as University supervisor.

Signature: ........................................ Date: ........................................

DR. WINNIE MWANGI

University Supervisor
ACKNOWLEDGEMENT

My sincere gratitude go to Dr. Winnie Mwangi, my supervisor for her patience, continual guidance, encouragement, constructive criticism and being available anytime I needed her assistance without which the research project would never have materialized.

My special thanks to my family for their effort into this work through encouragement, prayers and support – socially, economically and morally in enabling me come up with this research project.

Thanks to all members of the staff of the School of Built Environment and the entire University of Nairobi staff fraternity for their contribution. Many thanks to my lecturers, students and friends who have influenced both my academic and social life, especially Bachelor of Real Estate, class of 2014, for their constant help, encouragement and criticism of each others’ work as I gained more view into this research out of different opinions on the way to carry it out.

Credit to all the respondents especially the officials from NHC, contractors of government housing construction projects and consumers of government housing construction projects for their faithfulness and assistance.

Am grateful to God, may all the glory and honour be to him for making it possible for me to reach this far, it is through his blessing.
DEDICATION

This is a special dedication to my late father Mr. Karanja, my dear mum Mrs. Margaret Karanja and my three beautiful sisters, Peris, Mary and Leah for their love, understanding and support all through.

God bless you all.
ABSTRACT

Majority of governments housing construction projects in Kenya and most developing countries do not get completed within the initially set targets of time, cost and also quality. Delays in projects are seen to frustrate the process of development and also have an immeasurable cost to the members of the public at large. With this regard, it has become of paramount importance to investigate the causes of delays so as to improve the construction industry performance and enable it to achieve the objectives.

This research study aimed at investigating the causes of delays in government housing construction projects. The specific objectives of the study were; to investigate the causes of delays in government housing construction projects, to analyze the impacts of delays in government housing construction projects and to make recommendations on how to address these delays in government housing construction projects.

The researcher reviewed literature of books, journals, articles and unpublished reports on the topic. The research study employed a case study approach with NHC being the research case study chosen. The samples were chosen randomly. Primary data was collected through questionnaires and interviews.

The research study found that major delays in government housing construction projects were caused by construction finance. Both the officials from NHC and contractors respondents indicated that construction finance was the major delay causing variable. The contractors also observed that having many signatories to authorize payment of interim certificates further compounded the problem of construction finance as this affected the performance of the contractor. Delays in government housing construction projects were found to impact negatively on cost performance, time performance and quality of the final product.

The study recommended that the government introduces housing infrastructure bonds. These are bonds issued by the government to get funds that will be used to finance housing construction projects. Also, the number of signatories required to authorize payment to the contractor should be reduced.
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ABBREVIATIONS

NHC : National Housing Corporation
LAPSSET : Lamu Port Southern Sudan Ethiopia Transport Corridor
SSS : Site and Service Schemes
CAP : Chapter
PAC : Public Accounts Committee
PIC : Public Investment Committee
PEP : Project Execution Plan
PMC : Project Management and Control
CHB : Central Housing Board
KPLC : Kenya Power & Lighting Company
EMCA : Environmental Management Coordination Act
NEMA : National Environment Management Authority
CHAPTER ONE

INTRODUCTION

1.1 Introduction

Shelter is one of man’s basic needs; this means that every person has a right to a decent shelter both in terms of quantity and quality. Thus, given the high cost of construction and the prevalence of low incomes in developing countries, only a small number of households mainly from the middle income class and upper income are able to purchase a house outright.

The Universal Declaration of Human Rights gives one of the human basic rights as the right to a decent housing (United Nations, the Human Rights Article 25, 1948). Housing as a basic human right demands that urban dwellers should have access to decent housing, defined as one that provides a foundation for, rather than being a barrier to, good physical and mental health, personal development and the fulfillment of life objectives.

The construction process covers the period from the initiation of a building project until the finished structure is ready for use. During the building process, there occurs a progressive defining of the structure which follows a well known course of: conception phase, design phase, design realization, and construction on site.

The construction industry is complex in nature due to the large number of parties involved ranging from clients, contractors, consultants, subcontractors and many others. However, the industry is significant in the national economy as it sustains national wealth and investment. In many countries, especially less developed; buildings and infrastructure constitute 60-70% of the national wealth and about 20% of the annual wealth creation. Therefore, growth in the construction industry is critical as it’s among the largest sector that generates employment as well as development of skills for local contractors. The construction industry is more significant in developing countries since its key to the process of development (World Bank, 1984).
The duration of construction projects is increasingly becoming an issue of concern among the stakeholders in the construction industry. This is because of increasing rates of interest, commercial pressure, inflation and land disputes that may arise.

Various sources indicate that both residential and small construction projects suffer delays and comparatively have more contractual problems than big projects which are exclusively undertaken by well established construction firms. These delays are mostly as a result of miscommunications between property owner, contractors, subcontractors and property consultants. The misunderstanding and unrealistic expectations are usually avoided through use of detailed critical path schedules which specify the work of timetable to be used.

Delays in construction projects as already said above are frequently expensive since there are a number of phenomenons which change due to these delays. For example, the construction loan involved which charges interest, management of staff dedicated to the project whose costs are time dependent and ongoing inflation in wage and material prices.

The problem of delays in the construction industry is a global phenomenon and the construction industry in Kenya cannot be an exception. For example, studies carried out in Saudi Arabia found that only 30% of the construction projects were completed within the scheduled completion dates and that the average time overrun was between 10% and 30% and in Nigeria, the performance of the construction industry was found to experience time overruns such that 7 out 10 projects surveyed were not completed on time (International Journal of Project Management, 2007).

In Kenya, the construction of Thika Superhighway which was set to be completed in the year 2011 was realized a year later. The deadline was moved twice resulting in both cost and time overruns. The project cost kshs.7 billion more than the original budget.

The construction of Greenfield terminal at Jomo Kenyatta International Airport had its start date postponed several times which make the project far behind its schedule at the moment.
LAPSSET construction project which is said to be part of Vision 2030 initiative, the year 2030 seems will be here before any substantial steps have been made and not forgetting Konza Technology City which is now seen as a dream of real estate project that is almost unachievable.

1.2 Problem statement

Government buildings comprise of all public utility structures such as residential houses, public amenities, institutions, commercial centers among others. The public sector plays a significant role in provision of housing units but still behind the required quantity demanded in the industry. Therefore, the private sector comes in to assess and try to reduce the gap between the supply by the government and the demand.

Housing Construction work in Kenya by the public sector is carried by the Department of Housing in the Ministry of Lands, Housing and Urban Development. The Ministry was formed in May, 2013. In public housing in Kenya, the actors include the ministries mandated for offering policy initiatives and coming up with national housing programmes which include bodies such as the National Housing Corporation and any other semi-public finance institutions such as the Housing Finance Corporation of Kenya. The major players in provisions of housing by the government include the National Housing Corporation (NHC) which the researcher will use as the case study and the County government.

In the last fifty years, construction projects have advanced to higher levels of complexity. For example, quite recently, complex projects have been initiated in Kenya which cost millions of shillings, take longer to accomplish and involve enormous expertise. Complexity of construction projects is defined by size, cost and time, when these attributes seem to be larger than usual. Also there has been a change in the way that many major heavy construction engineering projects are delivered which was mostly noticeable in Western Europe where local levels of investment have dropped and many project management contractors are now working on projects in other parts of the world.
The main objective of all stakeholders in the housing construction industry is to realize the population’s demand for shelter within the overall needs of the society and in return make profits (Ferry, 1991).

The rapid increase in population in Kenya and consequently increased levels of urbanization and urban growth necessitates the need to increase the supply of affordable housing. However, the demand for housing and the supply of housing units in developing nations like Kenya are not equitable. This is due to frequency in the delays experienced in housing construction projects undertaken by the government in the provision of affordable housing as most urban poor cannot afford the housing provided by the private sector since they are beyond their reach.

The problem of provision of housing to cater for the demand has to be solved within the minimum time, cost and technical performance. This situation has to be attained in all government housing construction projects and can only be done if efficiency in construction process is observed.

Delays in housing construction projects are clearly observed in government projects. The players in this industry are too few and demand is very high hence the construction process is not well managed leading to the problem of delay during construction process.

The private sector has also a role to play in housing construction projects but its main aim is that of maximizing profits which is beyond the financial capability of many low income households. Therefore, the national government comes into play in order to provide sustainable housing and other basic amenities for the urban poor and in the process curbing emergence of slums and informal settlements.

Over time there have been delays in government housing construction projects. The government housing construction projects have neither commenced nor been completed at the set time. The government is mandated to carry out housing construction projects in order to provide affordable housing for the poor both in Nairobi and other parts of the country.
Article 43 of the Constitution of Kenya 2010, gives every person the right to accessible and adequate housing, and to reasonable standards of sanitation.

In view of these observations, there is need to carry out a study to investigate the major causes of delays in government housing construction projects with the view of finding appropriate recommendations to the causes of these delays.

1.3 Research questions
The researcher will focus the study on the following set of questions:

- What are causes of delays in government housing construction projects?
- What are the impacts of delays in government housing construction projects?
- What are the recommendations on how to address these delays in government housing construction projects?

1.4 Objectives of the study
The aim of this study is to explore the problem of delays in government housing construction projects with the National Housing Corporation (NHC) being the researcher’s target area of study.

The specific objectives of the study are:

- To investigate the causes of delays in government housing construction projects.
- To analyze the impacts of delays in government housing construction projects.
- To make recommendations on how to address these delays in government housing construction projects.

1.5 Research Hypothesis
The major delays experienced in government housing construction projects are due to the bureaucratic and lengthy regulatory procedures that control the construction industry.
1.6 Significance of the study

The outcomes of this study will be of great significance to the following players in housing construction projects:

- The government will be aware of the factors that cause delay in government housing construction projects and ways of addressing those delays so as the housing construction process is harmonized therefore efficiency in the production of housing units.

- Efficiency in the construction process will lead to provision of affordable housing and as a result affordable housing to the urban poor who can’t afford to purchase houses developed by the private sector, consequently curbing emergence of slums and informal settlements. This will better standards of living of the population leading to growth of the economy.

Kenya, being a third world country calls for the government to ensure efficiency in housing construction projects for it to adequately house its population. This necessitates the need to investigate the factors responsible for delays in government housing construction projects.

In this study, the researcher has appreciated previous findings and has focused on the causes of delays in government housing construction projects undertaken by the National Housing Corporation (NHC) in Nairobi County.

1.7 Justification of the study

The universal standards for human rights states that housing is a right that is mandatory to all citizens of the country irrespective of their income levels though it is very difficult for the government to provide housing to all the income groups. The government does not deliver on time the housing construction projects as set out in planning stage and the issue that need to be addressed is what the factors responsible for these delays are.

Delays have been experienced in government housing construction projects especially those undertaken by the National Housing Corporation (NHC). NHC is mandated to
develop decent and affordable housing, to facilitate rural housing development etc but it has failed considerably in doing so.

Timely delivery of projects within the stipulated budget to the level of quality standards specified by the client is a measure of a successful project delivery. The failure to achieve the targeted time, the set out budgeted cost and specified quality result in various unexpected negative effects on the said projects. When projects are delayed, they are either extended or accelerated and hence incur additional costs.

In view of the above observations, there is need to carry out a study to look into the causes of delays in government housing construction projects, with the view of finding relevant recommendations to the problem.

1.8 Scope of the study

The study will be done involving only cases of government housing construction projects within Nairobi County. This is where most of the government housing projects have been initiated and it is believed that Nairobi County is a representative of the other counties.

Besides, time and money are resource constraints that will not allow all delayed government housing construction projects to be sampled.

The emphasis of the research study will be on project performance and specifically the issue of overruns.

Government housing construction projects under the study will be designed, documented and supervised by the Ministry of Lands, Housing and Urban Development formerly Ministry of Housing with National Housing Corporation(NHC) being the developer.

1.9 Organization of the study

The researcher has organized the entire study into five chapters. Chapter one is basically introduction to the study. The researcher builds a case on the delays experienced in government housing construction projects undertaken by the National Housing Corporation in Nairobi County. The researcher then states the problem of the study and objectives of the study together with the hypothesis of the study, scope of the study,
justification of the study and significance of the study. The researcher also defines the terms that will be used more frequently in this study in chapter one.

Literature review is covered in chapter two. This chapter entails a review of past researchers’ works on the subject of construction projects and project performance. The researcher begins by giving a narrow introduction into construction and project performance. The researcher then studies the management of government housing construction projects and their sustainability to the target clientele such as their ability to meet standards, ability to reach the target group, ability to complete in the stipulated time as well as ability to complete without incurring cost overruns. The organizations mandated to undertake housing construction projects are analyzed after which the research study looks into the factors responsible for efficiency in housing construction projects. The factors hindering on time completion of housing construction projects are also covered in this chapter. The researcher then studies the legal frameworks governing construction projects in Kenya.

Chapter three entails the research methodology. It encompasses a description of the case study area.

The data collected is analyzed in chapter four. The researcher employs an integral approach using both quantitative and descriptive analysis in presentation of data.

A summary of findings is done and conclusions made in chapter five. Recommendations are then drawn from the findings of the research, suggestions from the respondents and the researcher’s opinion. A proposal of areas is made following the recommendations.

1.10 Terms used in the study

Cost overrun- The extra cost paid to the contractor above the initial estimated cost of the whole project at the time the tenders are submitted.

Time overrun- This is the extra time which the project takes from the normal estimated period that the project could have taken whether allowed by the contract condition or not.
**Contract period**- The total time the contract takes from inception to completion including any extended period that is meant for correcting faults before the certificate of practical completion is issued.

**Contract price**- The sum to be ascertained and paid in accordance with the provisions and not a specified amount of money at the time the contract is signed.

**Undercutting**- The carrying out of a construction project with low costs than the estimated cost it can consume.

**Adequate housing**- This is housing with adequate space, privacy, safety, lighting, ventilation and security of tenure, basic and social infrastructural services and free from environmental hazards.

**Project**- an overall task which has a definable beginning and definable end, it consists of a number of related and dependent activities, all of which utilize resources and upon which there are imposed internal and external conditions.

**Project performance**- This is an aspect of project accomplishment in regard to the subjective matter of the client and the public at large.

**Project delay**- The delay referred to in this study is the failure of government housing construction projects to meet standards, to reach target group, cost and time overruns.

**Buildability**- This is synonymous to constructability and refers to the goal of producing the best construction product by making the best possible uses of resources.
2.1 Introduction

Construction industry is a vital part of any economy which seeks growth. This is due to the direct relationship which exists between capital formation and economic growth. Construction is big business in the United States. According to the Bureau of Labour statistics; the industry employs 7.7 million people and represents 5.5% of the work force, making it the nation’s largest single employer. The construction industry is faced by scarcity of required resources such as limited access to finance, increasing prices of materials, labour and plant. Construction facilities are expected to be viable in the light of these difficult circumstances, demanding that a high degree of efficiency be achieved in the construction process. The characteristics of the industry and projects are always changing. Necessitating flexibility and amorphous systems of project delivery which can adapt to differing project circumstances (Sidwell, 1990).

2.2 Government Construction Projects

The choice for research on government housing construction projects as opposed to private projects was due to the following reasons; information is much more readily available with the government as opposed to private stakeholders who are either scattered away or fragmented. Also, the government continuously constructs building from its programme and is a fact that the government construction projects are more prone to delays and that mitigation of these delays can be very beneficial to the stakeholders in the project cycle (Seboru, 2006).

The government body charged with provision of public housing in Kenya is the National Housing Corporation (NHC). A large number of housing has been realized since the year 1953 but the demand for housing still far exceeds supply due to the high rate of urbanization, increased poverty, escalation of housing costs and the lack of a clear government initiative towards the same. The table below indicates the percentage of the
various types of dwelling units developed by the National Housing Corporation between 1967 and 2010, over 50,000 units developed during that period;

Table 2.1: Percentage of the various types of dwelling units developed by NHC between 1967 and 2010

<table>
<thead>
<tr>
<th>Dwelling Type</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortgage</td>
<td>5</td>
</tr>
<tr>
<td>Rental</td>
<td>26</td>
</tr>
<tr>
<td>Tenant Purchase</td>
<td>18</td>
</tr>
<tr>
<td>Site &amp; Service Schemes</td>
<td>35</td>
</tr>
<tr>
<td>Rural &amp; Peri - Urban Loans</td>
<td>16</td>
</tr>
</tbody>
</table>

Source: National Housing Corporation (2010)

Site & service schemes, rental and tenant purchase are the major types developed in that order. SSS is where physical infrastructure is developed on occupied land and plots allocated to individuals who are then encouraged to develop houses within their means but of a standardized type plan. Rental housing provides for affordable rental housing in various formats designed and developed for low to middle income groups. Tenant purchase provides for long term funding with payment rates relatively lower than the prevailing mortgage rates. Mortgage housing is for middle to upper level income groups where houses are developed and sold through conventional mortgage institutions.

The contribution to the building industry cannot be assumed. The government contributes in terms of demand about 50% to the building industry. This is a very significant contribution from a single client. Thus, an improvement in performance in such a sector would be great when applied to the whole sector no matter how small the improvement might be. Consequently, due to its value it would mean a sizeable saving nationally than would be the case for a single private client (Mbatha, 1986).
Khang’ati (1986) observes that the main government agency which is charged with overall responsibility of mobilizing public resources earmarked for building construction works in Kenya has been severely criticized and concern rose about poor implementation of projects initiated. He noted that since 1980s there has been a declining contribution by the public sector to the prevailing housing needs. On the contrary, the private sector has experienced only a small fluctuation. Housing projects done and completed by public and semi-autonomous public organizations have taken abnormally long to be completed leading to both cost and time overruns. Though the same problem is being experienced in the private sector too, the issue is alarming in the government construction projects.

Construction of housing is characterized by high cost and extreme durability. The government action is necessary to ensure an adequate supply of housing and consequently maintain socially acceptable standards and to provide financial assistance to families unable to pay the prevailing market prices. At the same time, the relevance of housing in relation to national investment as well as national and regional economic development programmes cannot be described as merely a social policy. Furthermore, the interest of the government in both social and economic objectives of housing policy involves concern for a wide range of related issues, for example, the construction industry and the supply and price of land.

The high capital cost of housing. Housing is extremely costly when compared to other economic activities. Houses are regarded as items of capital investment destined to last for several generations therefore the government has a significant role to play in the provision of housing. There have been attempts to design short-life houses at low costs but have not been successful. Alternatively calculations based on different assumptions do not significantly affect the general proposition that the high capital cost of new housing involves annual costs that may be regarded as undesirably high for those on average incomes and super high for those with low incomes. This is a major field within which governments have operated in the provision of housing. Mbatha (1986) states that it is not known to what extent government projects are normally delayed or the extent to
which their costs are escalated but notes that delay is not the problem but the costs escalation and time extensions.

Delays in completion projects are a common phenomenon. Sefu (1986) observed that in Kenya many building projects have exceeded their original estimated costs and completion periods. Some projects have even fallen below what would be termed as acceptable performance standards.

Housing standards; the long life of housing has another aspect in which the government comes into play. Since houses last for such long periods of time it follows that the standard of the houses currently being constructed and the standard of upkeep of old housing is of great concern to future generations as well as the one for whom the houses are initially provided. What is regarded currently as socially acceptable housing standards may well be inadequate for future needs but this line of thought should not be pressed too far. The fact that houses are constructed in a fixed position of land is one important feature that housing assumes. Thus when assessing future needs what is of great relevance is not whether new houses are of adequate construction but whether they provide sufficient space both within and outside for needs which can be expected to become effective demand in the foreseeable future (Cullingworth, 1968).

2.3 The Construction Process

The building process of government housing construction projects covers the period from the inception of the building project until the finished structure is ready for use. This follows a well-known course of; inception, design, tendering, construction, commissioning and maintenance.

2.3.1 Inception

This is the stage when the client establishes his needs in principle but not in detail and appoints the consultants. The government should establish the basic needs in terms of functionality and the quality of the project and the cost and time parameters it wishes to lay down.
2.3.2 Design

This is the stage where the client contacts the architect and presents ideas. Preliminary details of the project including deadlines and cost are defined in this stage.

2.3.3 Tendering

This is the process of hiring a contractor to undertake construction work. The ability to optimize resources allocated to the construction project depends on how well the tendering process has been undertaken. There are three systems of tendering;

   a) Open system

This occurs when the whole population of potential contractors is invited to tender for the construction works through an advertisement in local and international newspapers.

   b) Selective tendering

This occurs when a number of contractors are shortlisted based on various criteria and invited to tender for the construction work. This is more common for getting the contractors where there is need to control the quality of the construction work.

   c) Negotiated tendering

This involves inviting a particular contractor to tender for the construction work and opening negotiation. This system eliminates the issue of competition.

2.3.4 Construction

Construction process involves putting up the structure on site. It involves activities such as excavation, laying the foundation, walling, and roofing among others.

2.3.5 Commissioning

This stage involves allocating the finished structure to the relevant stakeholders. The contractor offers the housing project to the NHC for the Corporation to allocate the housing projects to the relevant people.
2.3.6 Maintenance

BS3811 defines maintenance as work undertaken to keep, improve or restore every facility, that is, every part of a site, building and its contents to an acceptable standard.

2.4 Causes of Delay in Construction Projects

Project delay is the extra time incurred over and above the originally set project contract period. The delay referred to in this study is therefore the failure of government housing construction projects to meet standards, to reach target group, cost and time overruns. The parameters used to measure delays are time performance, cost performance and quality of the end product (Morledge, Smith & Kashiwagi, 2006).

However, the relative importance of time, cost and quality in relation to any project will affect the choice of the most suitable procurement strategy for the project. The following table shows examples of prioritized criteria by client type:

**Table 2.2: Example of prioritized criteria by client type**

<table>
<thead>
<tr>
<th></th>
<th>Owner-Occupier</th>
<th>Developer</th>
<th>Investor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality</td>
<td>45</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Time</td>
<td>25</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>Cost</td>
<td>30</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

**Source: Morledge, Smith & Kashiwagi (2006)**

Where the use of the building is of great importance, the quality will be of great interest. If the project targets a particular market then time will be of paramount consideration. If the project operates on a limited budget, then cost will be of great significance.
Project delays are a common problem in the international industry of today hence the need to investigate the reasons for delay. Delays are usually followed by cost and time overruns, delays experienced in construction project have immeasurable effects on parties (owner, contractor, consultant) to a contract in terms of a growth in the way they relate, mistrust, litigation, mediation, arbitration, cash-flow problems, and a feeling of apprehension toward each other (Oraro, 2012).

The problem of delay is a common phenomenon worldwide. Hamza (2012) argues that delay is a common issue in most developing countries including Malaysia. He defines construction delay as time overrun or extension of time for completion of a project. The field survey conducted included the experienced developers, consultants and contractors. He notes that construction industries in Malaysia are growing very fast and that construction activities are derived from the local economic activities in the country. The construction of non-residential and residential buildings contributes between 40 to 55% of the total construction between 2006 and 2009. Furthermore, he explains that project delay is that project which is experiencing delays in the construction period where there are different gaps between the actual in-progress sites work compared to the work scheduled. The failure to achieve targeted time, budgeted cost and specified quality can result in various negative effects on the projects. When the construction projects are
delayed, they are usually extended or accelerated and therefore incur additional costs. He observes that the real causes of delays are labour input, construction materials, construction equipments, financial resources, incompetent contractors, developers, government regulation among others.

In Saudi Arabia, Al Assaf (1995) found out that only 30% of construction projects were completed within the contracted deadlines and the average slipping period was between 10 and 30%. He observes that when the project participants realize that the projects will experience some deadline slippage, they provide a deadline extension or they accelerate the pace of the works execution. This consequently leads to additional expenses, normal practices which generally permit an addition of a supplementary cost percentage based on prior study. Time performance is one of the key measures of the project’s success. He finds out that the most important causes of delay to include; payment of interim certificates to the contractors, approval of shop drawings and also the resulting problems in cash-flow arising during construction, changes in design, disputes in work schedules of subcontractors. Al Hazmi (1987) studied the main causes of delay in Saudi Arabia. He concludes that financial problems arising from slow in decision-making process and design changes were the most severe factors.

Mohammed (2012) while carrying out a study on the causes of delay in Nigeria construction industry observes that delay is one of the major problems in the construction industry. These delays led to many negative effects such as disputes between clients and contractors, increased costs, loss of productivity and revenue, and termination of contract. Like most developing countries, Nigeria construction industry has suffered many setbacks in terms of completion of the project at stipulated period within the predetermined sum. Majority of the construction project in Nigeria experience time and cost overrun which in turn lead to the abandonment of project. He observes that the factors influencing delay in the country are; improper planning, lack of an effective communication system, errors in design, shortage of supply like steel, concrete, slow decision making, financial issues, shortage of material, cash-flow problems during construction, increase in quantities, mismanagement by the contractor, notification of
extra work, changes in site conditions, date of notice to proceed, subcontractors. He recommended that adequate planning; coordination and proper monitoring of the construction projects by experience and qualify professionals should be encouraged to reduce the impact of delays on construction projects.

The causes of delay in building construction projects in Ghana was investigated to determine the most important according to the key project participants, that is, clients, consultants and contractors. Fugar and Adwoa (2010) observe that construction delay is a major problem facing the Ghanaian construction industry. He finds out that the major causes of delay are; delay in honouring certificates, underestimation of the cost of a project, underestimation of complexity of project, difficulty in accessing bank credit, poor supervision, underestimation of time for completion of projects by contractors, shortage of materials, poor professional management, fluctuation of prices/rising cost of materials and poor site management. The top three were financial, materials as well as scheduling and control. He recommends that the importance of adequate and timely provision of financial resources in building construction management cannot be overemphasized. Adequate finance is the hub around which everything else revolves. The challenge of project participants is to identify ways to eliminate or reduce the occurrence of financial crisis during the construction process.

C. Harris (1985) notes that over the years large construction projects have become more complex as new technologies have demanded concentration of resources into single facilities, for example, power stations, petrochemical plants, container ports, airports, etc. A striking feature of many such projects has been the noticeable occurrence of cost and time overruns, excessive in a number of cases. The emphasis is directed towards the problems experienced by contractors. He observes that the major factors leading to unanticipated delays and extra costs on large projects were late receipt of information, variations, subcontract works and procurement delays, ground problems and bad weather. There appears to be general agreement between contractors and consultants about bad weather delays. He makes a number of recommendations, for example, procurement problems may suggest that supply contracts should have been placed earlier or perhaps
construction was commenced too soon, or the best supplier was not chosen. The construction industry has always suffered from fragmentation owing to the temporary nature of project execution. The management should try to mitigate the effects of fragmentation and specialism by adopting a project strategy which will combine the skills of individuals and groups from contributing organizations so as to have the best balance of resources available at the right time.

Desai (2013) while carrying out a study on the critical causes of delay in residential construction projects observed that delay strained relationships between the parties involved. Ramalingam (2005) while carrying a study on information technology control on time and cost overrun of construction projects in India indicates that government projects in India have recorded cost overruns as high as over 60%. The cost and time performance of the projects can be controlled by adopting information technology enabled project management. The dynamic nature of the project management software tools address most of the human factors which lead to cost and time overruns at the cost of project quality. He takes into account that construction projects have five phases in the project life cycle namely, conceptual, planning, tendering, execution and commissioning. The impact on quality, cost and time is felt more at the execution stage of the project. In India nearly half of all roads projects see cost overruns greater than 25 percent, and more than half see delays adding fifty percent or more to completion times. The quality of infrastructure constructed can also leave much to be desired. Press reports suggest that an Indian government survey of a recent rural roads project found one fifth of completed roads to be unsatisfactory (World Bank, 2007).

Ahmed and Azhar (2008) while presenting a paper on identification of the major cost overrun factors in the construction sector of Pakistan observed that cost was among the major considerations throughout the project lifecycle. The study aimed at providing the way forward for future in coping with those overruns and hence could be regarded as one of the most valuable parameters of a project and consequently the driving force to the success of a project. However, it is often the case to see a construction project failing to achieve its objectives within the specified cost. Construction sector in Pakistan is an important sector, despite it not working to its fullest potential is still of prime significance
to the country. Therefore, growth in this sector is critical for rise in national income as it is among the largest sectors that generates employment within the country as well as a key driver for economic development of Pakistan. There are several factors that are responsible for these cost overruns. This paper attempts to identify the major cost overrun factors in the construction sector of Pakistan, which can serve as the way forward for future work in coping with these overruns. They note that both internal and external aspects of business setting are present as the prime contributors to cost overruns. They observes the top ten cost overrun factors to be: fluctuating prices of raw materials, high cost of manufactured materials, costly machineries, uncompetitive bidding procedures in procurement, unprofessional management of site, design and procurement design, unproven methods of estimating costs, work additions, poor planning, and poor government policies.

Chan (2005) identifies the factors responsible for variance in the duration of construction projects in Hong Kong. He notes that in the first phase exploring the effects of project scope factors and non-project scope factors is necessary. They are factors such as productivity levels on construction duration based on a questionnaire survey. In the second phase he determines and compares the ten most major factors causing project delays as perceived by the clients, consultants and contractors which he derives from another questionnaire survey. In the third phase he formulates the benchmark measure of industry norms for overall construction periods of public housing projects by modeling the durations of the primary work. This enables a comparison of construction time performance of individual projects against industry best practice.

Talukhaba (1999) while carrying out a study on high rise building projects in Nairobi finds out that there are specific variables that significantly cause project delays. These specific variables are to a large extent connected with project participants, the process, and both the physical and social-economic environments of the project. These stakeholders inevitably interact to achieve a project. For example, the client, the design team, the contractors and subcontractors constitute the participants. Disputes, claims, approvals, and payments certificates are associated with the process whereas the building materials financial resources and construction equipments constitute the socio-economic
environment. Rock, underground water, and rain are attributes of the physical environment.

Talukhaba (1999) observes that the client’s payments and architect’s instructions are the major factors responsible for delays of construction projects. He notes the causes of delays in construction projects as changes in design by the project team, poor financial management by both the client and the contractor, conditions of the subsoil on the site of project construction and subcontractors engaged in projects to carry out specialized works such as plumbing, air conditioning and electrical installations. Other causes of delays are contractual disputes between the client and the contractor, industrial disputes between the contractor and the workers, poor resource management of materials and equipments by contractors as well as lack of recognition and prompt response to risks associated with the project both in the physical and socio-economic environment of the project.

Seboru (2006) observes that there are three most common variables that are significant in causing delays, namely payment by clients, slow decision making and bureaucracy in client organization and claims. These three variables accounts for 49.1% of the delays in the 19 projects he sampled. Thus, if the aforementioned three variables are taken care of them almost half of the delays in the project can be avoided. The real cause of the project delays observed were same observed by Talukhaba (1999) such as design problems, sub-soil condition, sub-contracts, poor management of financial resources, industrial and contractual dispute. Others factors causing project delays were permits of license from the relevant authorities, weather condition, political interference, natural factors such as floods and landslides, materials testing to ensure that they meet the required specification and standards, underground service such as electricity cables, advanced technology and delivery of materials to site by suppliers.

Talukhaba (1988) states that the methods of tendering, variation and delayed payments are the significant factors affecting project performance. He observes that the government is the poorest in project management; the private sector comes in second whereas the parastatals are performing better. Competitive tendering does not necessarily achieve
value for money as originally thought and the bills of quantities does not offer any advantage in project time and cost performance despite the resources that go in its production. Poor time performance was mainly attributed to the method used in fixing contract period which was found to be obsolete. Time and cost performance was influenced by conditions associated with different types of clients.

Talukhaba (1988) argues that the problem of time and cost overruns in the construction industry is far from complete until all the other factors are considered, to find their influence on the time and cost performance of projects. Factors such as difference of sites, material markets, labor force markets, disputes organization structures, communication motivation, national economic performance and government policies needs to be researched on.

Dindi (2004) looks into Quality management as a challenge for the Kenyan constitution industry. He observes that many scholars including Mbatha (1986) and Talukhaba (1999) found out that majority of building contracts in Kenya suffers cost and time overruns. He acknowledges that the cost and time is important in ensuring the success of a project, quality of a project is just as important especially in this era of globalization where competition is rife and the client is more aware about what to expect in a construction project. He concludes that indeed quality in the construction industry needs to be improved.

Khang’ati (1986) observes that the building projects are delayed and as a result the government spends more money on those projects. These delays do not augur well with the development of the nation since the government emphasizes on the provision of infrastructural facilities as a means of ridding several social ills, including employment and poverty. He concludes that delays experienced on building projects are caused by several factors. The most significant delay causing variables being seven namely, poor planning and control of public building projects, internal organization of the then Ministry of works, Housing and Physical Planning which was of functional type and found not conducive for efficient implementation of building projects, overloading, that is, the high number of projects the Ministry tried to implement with its limited number of
staff, the stifling bureaucratic system found in the treasury, the client ministries inefficiency, inefficiency of contractors and politic interference.

Bakuli (1986) while evaluating the training of small scale contractors in Kenya observes that the construction industry has a significant role to play in the economic development of the country. Therefore, he oversees that it is paramount that the indigenous people do participate actively in the process of capital formation and generation of income in their country. According to him the delays in the construction projects are due to lack of adequate number of trained small scale local contractors. This led to overreliance on foreign and large scale local contractors. Most of these contractors are unreliable and in most cases inefficient as they enjoy a form of status quo. There are many tasks in building and infrastructure construction projects within the competence of small scale local contractors and if effectively planned would be the basis of promoting local constructing skills. This process gives an opportunity to local contractors to gain experience and expand large scale operations.

The role of the organizational structure has been investigated to establish its relationship with the implementation of public building projects. Sefu (1986) observes that the realization of time schedules, cost and performance standards are of great importance to the industry and economy of this country as a whole but many building projects undertaken and implemented by public organizations in Kenya have exceeded their original estimated costs and completion periods and some have fallen below what would be termed as acceptable performance standards. The real causes of construction delays are as a result of non-availability of adequate financial resources, limited number of staff working in these projects, lack of proper communication between the client and the contractor, inefficiency on the part of clients and contractors.

Makone (2010) notes that University construction projects are similar to private sector projects in the manner they are executed but minor differences occur in the number of people and stages involved. He observes that projects are delayed due to the various factors; he finds out that procurement was one of them, procurement process and procedures within the university were not different except in the way of executing them.
There are a number of offices involved in carrying out the process in the form of approval throughout the channel and there was a need to shorten the process to align it with the general construction industry where they try to reduce the number of people involved in the procurement as much as possible. Another cause responsible for poor performance of University construction projects was observed to be claim and dispute resolution, that is, the process of claim and dispute resolution is slow due to delays in convening a meeting since the client (Vice chancellor) is always committed. Also, the university over the period studied did not have a master plan that to guide its construction projects for future development.

2.5 Measures to Mitigate Construction Delays

These are measures undertaken to help curb the problem of delays in the construction industry. They include but not limited to; training all construction industry participants on the most appropriate managerial skills, for example, planning, scheduling and control. This is called project management. Also, improving on the realism of construction period estimating and application of an efficient procurement approach are measures taken to mitigate delays.

2.5.1 Project Management

Project management can mean a variety of things to different people. More often, this concept is misunderstood because people have ongoing projects within their company and feel that they are using project management to control these activities. Training all construction industry participants on the most appropriate managerial skills, for example, planning, scheduling and control, that is, project management. Project management can be defined as the art of creating the illusion that any outcome is the result of the series of predetermined acts. Project management involves the process of planning, organizing, directing and controlling of company resources for a relatively short-term objective that has been established to complete specific goals and objectives. In respect to building projects, project management may be described as the work that an architect or an engineer must undertake when an owner finds it appropriate to retain him not only to design but especially to organize and carry through a project from the time of property
selection and acquisition to substantial completion by the last construction contractor, and
during warranty periods, to monitoring of deficiencies and their rectification (Mbaya,
1984).

Project management is the business of securing the end objectives of a project in the face
of opportunities, risks and problems which are encountered during the process of
construction. The functions of project management which are discussed herein describe
the crucial task which must be performed during the design and implementation of a
construction project. The aim is to bring to light the relevance to the field of construction
of functions of management as described in the general theory of management. The
objective of this is to enlighten the client and his management system on the crucial role
he should play in the performance of each function. Although the functions appear to
follow a sequence as a project progresses, they are, in fact, continuously and
simultaneously performed at every stage of a project. The functions discussed are
planning, organizing, directing and controlling.

a) Planning

The main objective of planning is to ensure that the various elements of a project are
properly coordinated, managed and controlled. A project is successful when the needs of
the stakeholders have been met. The major responsibility of the project manager is
planning. Where project planning is performed correctly, then it is perceived that the
project manager will work himself out of a job because the project can rub itself but this
rarely happens. Few projects are ever completed without some conflict for the project
manager to resolve. However, project managers cannot control or assign line resources
but they must ensure that the resources are adequate and scheduled to satisfy the needs of
the project, not the vice versa. Proper planning is the assurance that functional units will
understand their total responsibility towards achieving project goals and objectives. It is
the assurance that difficulties arising scheduling and allocation of critical resources are
known before hand. Also, early identification of problems that may curtail successful
project completion so that effective corrective action and re-planning can be taken to
prevent or resolve the problems.
Planning is the management function that involves setting goals, prioritizing these goals and deciding how best to achieve them. An organization without planning is like a sailboat minus its rider. Planning involves a basis for other major functions of management (Kathryn & David, 1998). Construction planning is fundamental and challenging activity in the management and execution of construction projects. This is because it entails; choosing the technology, defining the work task, and identifying any interactions among the different work task. A good construction plan is the basis for developing the budget and the schedule for work. In construction planning, it may also be necessary to make organizational decisions about the relationships between project participants and even the organizations to include a project. Poor planning in construction may be evident in budget and time overruns and strained relationships among the project participants. Kimani (2004) argues that the key planning parameters of design planning, finance planning and the planning process including skills and tools not only be incorporated in the contract conditions but be thoroughly observed to help limit the problem of delays in the construction. This will encourage consideration of plans on the execution of projects.

The responsibility of planning should be undertaken by the project manager because in a construction project there are various plans made by different parties throughout the construction phases. For the plans to be effectively inter-linked between the different phases there is need for a particular individual to combine all the plans and develop the project plan. This plan can then be monitored and controlled as necessary to ensure the success of the project (Lavender, 1996).

For government funded projects, there is need to review the budgeting policy with a view to having adequate funding to complete a project without delays that are due to lack of funds or payment approvals. It is recommended that the budget be set with proper cash flows and cost benefit analysis done to compare the benefits of having a completed project on time and the cost of finance. Project completion dates should be estimated with accuracy and computation of loss of revenue for delay known and communicated to the
key players of the construction project in order to encourage seriousness in meeting the completion targets.

A project plan involves setting out the phases, activities and tasks required to a successful project delivery. A project plan constitutes the timeframes required in project delivery, together with the resources and milestones. Planning is the most basic function of management, which arises due to scarcity of resources. This function lays the framework for influencing and regulating the flow of resources into a project and should always aim at maximizing efficiency in the use of resources, given a certain technology. One of the main reasons for delay and cost overrun is the lack of proper attention to the initial planning of projects (Khang’ati, 1986).

b) Organizing

Organizing is the process of building a framework to achieve the set goals and objectives. An organizational structure for a project results from a process which is made up of the following steps; the goals of the project are identified, quantifiable objectives are then established. Derivative objectives and policies are formulated from the main objectives. Major resource requirements such as sites, finances, manpower and materials are considered. Tasks such as the tendering process, actual construction on site ex cetera are analyzed for their resource requirements. The tasks are then allocated to organizations which are best suited to carry them out. Links are established between and among participants and tasks so that harmony is established throughout the project (Lavender, 1996).

c) Directing

(Kerzner, 1992) defines directing is the implementation and carrying out of those approved plans that are necessary to achieve or exceed objectives. It involves steps such as staffing, training, supervising, delegating, motivating, and counseling. Planning and organizing effort would go to waste if participants do not carry out their duties with the amount of zeal necessary to produce results. Directing is concerned with channeling the organization’s human resources towards the achievement of the set goals and objectives.
of the organization. There are three forces which interactive determine effective 
employee performance; first is the situational factors which refer to the environment and 
framework of relationships within which a person works. Second are the individual 
factors which refer to the innate and acquired characteristics which make a person 
suitable or unsuitable for the performance of some task. The third is the motivational 
factors which refer to worker expectations which determine the enthusiasm with which he 
does work.

d) Controlling

Controlling is a three-step process of measuring progress towards an objective, evaluating 
what remains to be done and taking the necessary corrective action to achieve those 
objectives. The three steps are measuring, evaluating and correcting. Measuring is the 
determination through formal and informal reports the degree to which progress towards 
objectives is being made. Evaluating is exploring causes and possible ways to act upon 
significant deviations from planned performance. Correcting is to take control action to 
revise an unfavorable trend or to take advantage of an unusually favorable trend. The 
project manager is responsible for ensuring the accomplishment of group and 
organizational goals and objectives. Therefore, the project manager should have a 
thorough knowledge of standards and cost control policies and procedures so that a 
comparison is possible between operating results and pre-established standards. The 
project manager must then take the necessary corrective actions.

Controlling is the process of making events conforms to plans. Control cycle is an 
endless sequence of establishing standards, observing performance, comparing 
performance with standards and taking corrective action to increase the likelihood of 
achieving performance or to revise standards in the light of actual performance. 
Controlling is necessary in a building project because it separates design from 
construction, the contractor usually have profit motivations while clients have cost 
savings and good quality buildings as their prime motivations and resources are scarce 
and should be used sparingly. The functions of control systems are; to set standards, 
measure output, review standards, facilitate action and react to unacceptable deviations.
e) Need for project management

Sefu (1986) observes the need for project management as that which is necessitated by the fact that traditional forms of organizational structure and management techniques do not handle project type work effectively. Over time Kenya’s commitments in respect to the provision of the building and infrastructural facilities have increased both in numerical terms, scope and complexity. These commitments have had to be met from the scarce resources, which unfortunately have not been available in sufficient quantities due to the correspondingly slower rate of growth of the economy. Therefore, there has been some strain imposed on the resources. This strain has increased to higher proportions with the years. The explanation for this phenomenon lies partly with the world economic recession which among other things has curtailed the proportions of aids and grants which the country has been using to alleviate its adverse economic position; and partly with the booming population of the country which has made it more urgent for the country to increase its commitments despite its limited resources. In view of the above facts, the need for available resources to be rationally allocated and stringently controlled becomes rather obvious.

Building construction projects generally consist of many activities. The number varies according to scope and complexity of the projects. In order for any project to be considered well done, all the activities must be properly done. This requires the use of appropriate techniques to ensure that coordination in the execution is achieved and projects objectives do not suffer. At the implementation stage, the project objectives are normally to complete the project at the least cost, at the earliest possible time and meet the desired quality standards. Project management ensures this by providing good plans for the projects; and through the control system, ensuring that the unexpected and unwanted situations are detected early and corrected (Khang’ati, 1986).

Closely related to the foregoing is the fact that building construction projects involves various people of different professions and trades, for example, clients, architects, engineers, quantity surveyors, financiers, contractors ex cetera. All these people have personal objectives which in most cases are contradictory to each other and those of the
projects. They however have to work together, relate to each other harmoniously; achieving their own objectives while at the same time maintaining those of the projects. Project managers make this possible through their skillful application of the management techniques, both scientific and behavioral.

2.5.2 Improving on the realism of construction period estimating

The overall duration for a construction process should be compatible with and usually derived from a realistic construction process and its duration. Too short or too long duration leads to inefficiency and to arrive at an overall duration calls for study and creation of a realistic construction process. Majority of project managers rely on their intuition to estimate contract periods (Mbatha, 1986).

2.5.3 Choosing the most appropriate procurement approach

The efficient procurement of construction work through the choice of the most appropriate procurement strategy has long been recognized as a major determinant of project success. Public projects are subjected to parliamentary scrutiny and auditing by both the Public Accounts Committee (PAC) AND Public Investment Committee (PIC). Due to these requirements, public projects usually utilize competitive methods of procurement as well as other bureaucratic procedures of project implementation. The public sector contracts must be seen to be awarded fairly and without discrimination. The award process must be both transparent and accountable. The process of procurement is very important for the client to achieve highest value from the building and should be made as rationally as possible prior to design and perhaps as early as the feasibility study for the project (Bezelga, 1991).

2.5.4 Implementation of a new model of quality management in construction

Dindi (2004) recommends that further research to be carried out on how to implement a new model of quality management in construction and do away with periodic inspections and regular supervisions. He argues that these are some of the variables responsible for delays in construction projects. He further notes that there is need to look into how work ethics could be used to improve quality in construction with the workers being the focus
of the research study. He argues that this will play a great role in minimizing industrial disputes, contractual disputes and corruption in the construction projects as these are some of the factors responsible for the delays experienced. He also recommends that research be carried out on how to implement a learning programme on quality to all parties in the construction industry thereby increasing efficiency and consequently enhancing performance of projects.

### 2.5.5 Project financing by the client

Talukhaba (1999) also notes that further research needs to be carried out on project financing by the client with the aim of finding out how it is done and to establish whether it meets the global financing theory and the international project financing practice. He argues that research is paramount to develop a model of using constructability in the design and construction process to enhance the quality of design as well as coming up with a buildable design. He further notes that there is need to look into the areas of project estimating and price changes and to come up with ways of measuring these factors. He observes that there is need to device units of measurement that can quantify the cases of delays, especially financing and ability to construct and establish the optimum required for the success of a project. He notes that certain areas such as procurement, tendering, contracts, risk redistribution and training needed review as well as further research to establish how best they should be carried out. He goes further to propose the spectrum and direction of research in the construction industry and appreciates that the challenge ahead is to make research part and parcel of the process of construction, and to utilize the result there for the benefit of the construction industry.

### 2.5.6 Project execution plan (PEP)

A project execution plan is a document that sets out how the project as defined in the strategic brief will be procured. It defines the project strategy, organization, control procedures and responsibilities. Therefore, project execution plan can be described as the highest level project control document which forms a major plank in the project management and control (PMC) system. Topics in a project execution plan include; overview, specific objectives, proposed procurement strategy, project control mechanism,
project time schedule, project budget, personnel and lines of responsibility, evaluation methods and potential problems. A project execution plan is therefore paramount in the ultimate success of every construction project (Morledge, Smith & Kashiwagi, 2006).

2.5.7 Appropriate organizational framework
(Kerzner, 1992) notes that there has been a so-called hidden revolution in the introduction and development of new organizational structures. He argues that management has come to realize that organizations must be dynamic in nature, that is, they must be capable of rapid restructuring should the prevailing conditions dictate so. These factors may evolve from the increasing competitiveness of the market, changes in technology and also a requirement for better control of resources for multi-product firms.

2.5.8 Proper communication
Proper communications are vital to the success of the project. Communications are the process by which information is exchanged. Poor communication is a major hindrance to effective team development. Poor communication exists on four major levels;

- Problems of communication among team members.
- Between the project leader and the team members.
- Between the project team and team management.
- Between the project leaders and the client.

More often the problem is caused by team members simply not keeping others informed on key project developments. Poor communication practices often lead to unclear objectives and poor project control hence the need for proper communication to mitigate project delays.

2.6 Project Performance
Project performance is an aspect of project accomplishment in regard to the subjective matter of the client and the public at large. Different people will have different
perspectives on project depending on the extent to which the factor influencing project performance is to be accepted within the scope. Project scope referred to in this context varies significantly in the industry and this elaborates on the important parts of differences in project performance. Building project performance can be measured using a number of indicators namely, cost performance, time performance and quality (Dindi, 2004).

2.6.1 Conditions for Success

The success of any construction process depends on the way the project team members work together. It depends upon them receiving the same objectives for the project and recognizing that what each of them achieves depends upon what others do, for example, the work of the contractor, depends on the work of the subcontractors. Therefore, the role of the project manager has come about as a result of the inability of the contributors to achieve integration among the various project participants.

Time performance, cost performance and quality are always related and are the three criteria on which the success of a project is judged. The relationship between time, cost and quality may be described in the following terms; time is a function of cost and quality; cost is a function of time and quality; quality is a function of time and cost. This is according to a study of the performance on twenty five high rise commercial projects in Sydney, Australia. Amongst the findings is confirmation of the empirical relationship between total cost of construction and project duration though with slightly different constants.

The integration of a planning (time control) system and a budget (cost control) system gives rise to a number of problems. However cost information cannot be meaningful unless it is related to a time frame.

I. Time Performance

Construction time is of great importance to the investors of a project and to all the parties involved in the construction industry. Variables affecting time performance are scope, complexity and managerial effectiveness. Mbatha (1986) notes that contractors relate the
project scope to the expected expenditure per week to come up with the number of weeks required to complete the works.

Kivaa (2000) describes two time estimating methods as; one, mathematical method where estimators use their own intuition based on skill and past experience and two, mathematical method where the estimator uses the mathematical formulae in predicting the construction period. The then ministry of roads and public works had some guidelines of estimating contract periods based on the experience in past building projects. The guidelines attempted to match the contract period with the contract value and based on the finances set by the treasury for the project.

The management of time is a key prerequisite for a successful project because it has a direct impact on cost and quality of the project. Time presents a big challenge in the construction industry. These problems arise because many projects are not adequately thought through and planned before starting on site, thereby causing frustration, delay and disruption, which are breeding grounds for claims and disputes. The reasons for these are; pressure from clients, budgets which have to be sent before the end of financial year or lack of money, slow process of consultation and approvals especially by the public sector projects and traditional method of design followed by short tendering period and award of contract to contractor. The push pressures are to some extent balanced by pull-pressesures of bureaucracy, for example, tender advertising period, and time to comply with statutory requirements of health and safety planning.

In Kenya, project time performance is also worse than project cost performance. Mbatha (1986) study of government projects executed in 1967-1981 revealed that 735 of the projects are normally delayed while only 38% of them experience cost run. These observations imply that either cost estimates are more realistic than contract period estimates or project participants’ manage costs more carefully than they manage the contract period.

In spite of the strong correlation between time and cost overruns, time estimating and evaluation are given less importance in the construction contract administration.
Predicting the contract period is usually based on contractors or consultant’s past experiences and therefore the reliability of their prediction is difficult to assess. Preparing bills of quantities and estimating costs are given a more specific and clearer approach.

II. Cost Performance

There are many costs associated with construction projects. Some are not directly associated with the construction itself but are more important to quantify because they can be a significant factor in whether or not the project is successful. These include costs incurred through financial agreements, real estate transactions, consultant services, public relations, marketing, government regulations, maintenance and operations. None is a direct cost of construction but all put financial pressure on the project (Frederick & Nancy, 2009).

The cost of a project is important as it is one of the factors that bind the various parties to the project. To the client it gives the value of investment and delivery within budget is thus crucial. The contractor expects a profit and other service providers expect payments of their fees. Therefore, skillful planning and management of cost issues enables all parties to emerge winners in the project (Official Journal of the Quantity Surveyors of Kenya-volume 12, 2009).

Cost overrun is caused by additions, fluctuations, adjustments of sums, provisional quantities, uncertain ground conditions, wrong decisions, claims due to delay from designers ex cetera. Big projects have higher chances of cost overruns than the small ones and small projects have higher chances of being completed at costs lower than the original sum Mbatha (1986). He found out that contract size is always a function of cost performance. The relationship is observed to be a negative one meaning that cost performance improved with the reduction of contract size and worsens when contract size increases.

Mbatha (1986) carried out a study with the aim of establishing whether or not performance of government building contracts in terms of cost and time was poor in the period 1967-1981. This was necessitated by the fact that most of the government building
contracts suffered cost and time overruns. He observed that time overruns are more frequent than cost overruns but the two are not related. He noted that big projects are more prone to both time and cost overruns than the `smaller ones although delays have been found to bear no relationship to contract sizes.

The importance of avoiding delays and saving on contract period cannot be overemphasized. Construction time savings are more important because they mean real money savings to the building owner as long as the implementation of the time-saving system is not itself inherently more costly than the value of the time-savings to the owner. A shorter contract period produces savings to the building owner both in the price he pays the builder for the construction of the building and in the reduced value of carrying costs.

III. Quality

This involves undertaking the works to the specified scope and quality. From the clients brief, professionals specify the works in drawings and specification documents. Execution of works to the required specification is normally made easier if designs are clear and that no major alterations are made during the implementation phase.

One factor that is contributing to the success of organization and their need to sometimes span across traditional corporate boundaries is the evolution of internal quality management. Internal quality management breaks down barriers among organizations because customer satisfaction is the focus of work and the measure of success. This idea has taken serious hold in the United States during the last twenty years (Frederick & Nancy, 2009).

Quality can be defined as the totality of features and characteristics of a product or service that bears on its ability to satisfy stated or implied needs. The push for higher quality is customer driven Dindi (2004). Quality can take many forms, quality of design, quality of conformance and quality of performance. Quality of performance measures the degree to which the product or service satisfies the customer. Now this is where most construction projects go wrong. Sometimes the project may satisfy quality of design and
conformance but somehow the client may not be satisfied with the finished product. This shows that there exists a loophole somewhere. Benefits of good quality include; safety and effectiveness both for the client and the workers, client satisfaction, job satisfaction and better reputation and competitiveness. While acknowledging that cost and time performance are important in ensuring the success of a project, quality of the project is just as important especially in this era of globalization were competition is rife and the client is more aware about what to expect in a construction project. Quality in this case means the totality of features and characteristics of the product that bears on its ability to perform its intended function.

It is observed that there is poor implementation of quality in construction due to the following; lack of good communication between the different parties, not involving workers in setting goals and objectives related to their work hence lack of motivation among workers and lack of understanding among the parties of what quality really implies.

2.7 Legal frameworks governing construction in Kenya

2.7.1 The Building Code

The building code may be defined as a code or set of regulations prepared to control the standard of building work or a law, ordinance or government code established to regulate the standard of building and construction work and the suitability for use of building. The purpose of the building code of Kenya is to set minimum technical standards that must be achieved in construction of buildings. The current building code has not been reviewed despite evidence that it borrowed a lot of standards from the British colonial masters. Therefore, one of the problems to the provision of housing in the country since the environment are quite different and their acceptable standards quite high considering their technological development levels of income.

2.7.2 The Housing Act, Chapter 117

This is act of parliament concerned with providing loans and grants of public moneys for the construction of dwellings and to establish a housing board for the above purpose.
Section 3(1) of the act stipulates the establishment of a national housing corporation which is a body corporate by that name with perpetual succession and a common seal and which shall perform the duties and functions conferred on it by the act. These duties include establishing a housing fund and providing loans to instructions such as local authorities for building purpose.

2.7.3 The National Construction Authority Act No. 41 of 2011

This Act establishes the National Construction Authority which is a government agency established with the incidental powers of a corporate body. In the current government structure, the Authority is placed under the Ministry of Lands, Housing and Urban development. The Act consolidates the registration process whereby contractors of all classes of works register under one body thereby countering the various challenges and frustrations of numerous registrations with the various ministries. The Act provides the Authority with a heavy mandate to oversee the construction industry and regulate its development. Section 15 of the Act provides that a contractor shall not carry on the business of a contractor unless the person is registered by the board under this Act.

2.7.4 The Physical Planning Act, Chapter 286

This is an act of parliament for the provision of preparation and implementation of physical development plans and for connected purposes. Part v of this act gives the local authority the power to prohibit or regulate the use and development of land and buildings in the interests of proper and orderly development of its area. The act also gives power to the local authority to consider and approve all development applications and grant all development permissions, to ensure proper execution and implementation of approved physical development plans as well as to formulate by-laws to control zoning in respect of use and density of development. The act also stipulates that no person shall carry out development within the area of local authority without a development permission granted by the local authority.
2.7.5 The Public Procurement and Disposal Act

This is an Act of Parliament for the establishment of procedures for efficient public procurement and for the disposal of obsolete or surplus assets and equipments by public entities in order to maximize economy and efficiency. To promote fair competition, promote integrity, increase transparency and accountability as well as public confidence and promotion of local industry and economic development. It provides four forms of tendering; restricted tendering, direct procurement, request for proposals and request for quotations.

2.7.6 The Constitution of Kenya, 2010

Article 67 (1) establishes the national land commission mandated among other things; to manage public land on behalf of the national and county governments, to recommend a national land policy to the national government, to advice the national government on a comprehensive programme for the registration of title throughout Kenya. The COK, 2010 also establishes the Housing Development Fund to lend and grant money for development of approved housing schemes. The constitution grants parliament power to encourage use of acceptable and affordable intermediate technologies, building materials, innovations and methods. The constitution also encourages major government investments in property to benefit local communities.

2.8 Summary

The construction industry is characterized by the prevalence of the government as its client hence large public financial outlays are directed to this industry. Majority of construction activity in the country are partly financed through foreign borrowing and therefore the need to manage these projects efficiently to appease the foreign donors and creditors. The construction industry helps alleviate the problem of unemployment in the country by employing high number of both skilled and unskilled labour. In view of the significance of the construction industry in the economy, it’s paramount to employ good management in the industry to help curb construction delays observed in most construction projects.
CHAPTER THREE

CASE STUDY AND RESEARCH METHODOLOGY

3.1 Research Methodology

The study started with a narrow introduction of the construction process and project performance. The researcher then reviewed literature of books, journals, articles and unpublished reports on construction project performance concentrating on government housing construction projects. Also legislations touching on construction such as the National Construction Authority Act, The Housing Act, Physical Planning Act, Building Codes, The Public Procurement & Disposal Act and The Constitution of Kenya, 2010.

This being a fact-finding mission on the causes of delays in government housing construction projects, a case study approach was the most suitable method. This is because an actual case will illustrate clearly the issues the researcher wishes to discuss and also provide a source of the required data. The case study approach provides information both descriptively and quantitatively and therefore offers an adequate base for exploring the problem of delays in government housing construction projects (Yin, 2002).

3.2 Case Study

The National Housing Corporation is the research case study chosen in this study. It is through the National Housing Corporation that the government sets out to provide housing needs to the citizens. The pace at which these facilities are provided, that is, time performance, their ultimate cost, that is, cost performance and the quality upon completion are of considerable significance to the economy. These conditions of success of projects therefore justify the choice of the corporation as the research’s study area plus it’s a parastatal organization with its own institutional and legal framework to guide its operations and procedures.

The origin of the National Housing Corporation dates back to the year 1953. The colonial government of Kenya created a Central Housing Board through the housing ordinance.
The CHB was aimed at providing the medium through which the colonial government could promote development of houses for Africans. The NHC is a state owned Enterprise established in 1967 through an Act of parliament.

The National Housing Corporation is mandated to develop decent and affordable housing, to facilitate rural housing development as well as to mobilize local and international capital for development of housing. Other roles include forging partnership with the now established county governments and other stakeholders in housing development. The Housing Act Cap 117 of the laws of Kenya stipulates that the National Housing Corporation should provide housing by lending and granting money to any local authority (replaced by the county governments under the new constitution) for purposes of housing provision. The Act also mandates the NHC to give out loans to organizations, companies, societies or individuals for the purpose of developing approved dwellings. The Housing Act also gives NHC the power to put up dwelling houses, carry out approved schemes, provide services and acquire or maintain any land, building, estate or interest for any purpose of the Act. Section 10 of the Act empowers the NHC to establish and operate a housing finance institution with powers to borrow funds from the state, agencies from abroad, trust and pension funds and any other institutions or persons. Therefore necessitating the need to ensure government housing construction projects perform well and thus maintain continuous support from the donors.

The National Housing Corporation has embarked on building and managing estates. In 1987, the National Housing Corporation embarked on development of high rise flats under the Urban Renewal Program. The enterprise has been fundamental in assisting individuals in constructing better houses in rural areas through Rural Housing Loans Scheme. House constructions through site and service schemes were replaced by tenant purchase, mortgage and rental schemes over the time. Chepkoech (2012) observes that since 1987 there has been a gradual increase in building costs thereby leading to cost overruns and consequently project delays. The main objective of this research study is to identify the causes of delays in government housing construction projects and to propose measures to mitigate these delays.
Figure 3.1: Current organizational structure of NHC

Government

↓

Board of Directors

↓

Managing Director

↓

Technical Department
Administration department
Finance Department

Information Technology Services Unit
Internal Audit Unit

Source: Field Survey (2014)

NB: These independent units report directly to the managing director

3.3 Research Design

A research design maybe defined as the arrangement of conditions for the collection and analysis of data in a manner that aims to combine relevance to the research purpose with the economy in a given procedure. A research design provides a framework for the collection and analysis of data. A choice of the research design reflects decisions about the priority being given to a range of dimensions of the research process (Bryman, 2004). The researcher employed a research strategy that accomplished the study objectives in a way that conformed to ethical standards and legal safeguards for the research
participants. The government housing construction projects involve a large number of project participants ranging from the government, private individuals, and both the public and private organizations. Therefore, information relating to the projects is usually sensitive and thus the researcher assured the respondents that the information provided was to be treated with confidentiality and also was purely for academic purposes. Research is a study designed as a form of qualitative analysis and involves careful and complete observation of a social unit which could be a person, family, an institution, a cultural group or even an entire community (Kothari, 2004). The research study utilized both the survey and statistical designs. Both of these methodologies were necessary to achieve the objectives of this study.

3.4 Population Sample and Sampling Techniques

A sample is a set of elements selected in some way from a population. The aim of sampling is to save time and effort and also to obtain consistent and unbiased estimates of the population in terms of whatever is being researched (Schofield, 1996). The first step in sampling is to define the population of interest clearly and accurately. The samples were chosen randomly meaning that every element in the population of interest had an equal and independent chance of being chosen. There have been some arguments that without sampling there would be no statistics. This is explained by the fact that a careful study of a relatively small amount of data, conclusions is drawn about a very larger set of data and without actually studying the whole of the larger set (Graham, 2000).

Various sources indicate that construction industry activities in most developing countries are concentrated in capital cities and consequently most firms dealing with construction activities locate in these capital cities. This may be due to the rapid increase in population in developing countries; Kenya being one of them and consequently increased levels of urbanization and urban growth necessitates the need to increase the supply of affordable housing. Therefore, the population of projects sample was within the geographical boundaries of the Nairobi County.

The target population included projects that were started and construction finished by the year 2012. The sample consisted of four projects chosen following a systematic criterion
for the purpose of balancing the study in terms of different dwelling types constructed by the NHC. Each project was chosen from the following four different dwelling types; houses for direct sale (mortgage), rental houses to tenants, houses for sale by tenant purchase method and site & service schemes. The target population was the National Housing Corporation officials, contractors and consumers of the government housing construction projects. The national housing corporation officials included; project managers, financial advisors, land surveyors, valuers and estate managers, legal officers, architects, engineers and quantity surveyors. The research study targeted housing construction projects undertaken by the government via the National Housing Corporation.

3.5 Research Methods

3.5.1 Data Collection

A research method is a technique for collecting data. Data collection can involve a specific instrument, such as self-completion questionnaire or a structured interview schedule or participant observation (O’shea, 2013). Survey research is an easy, accurate, quick and cheaper way of acquiring information (Alreck, 1995). The survey research entails an elaborative design to which data are collected mainly by questionnaire or by a structured interview on more than one case and at a single point in time. This is to ensure that a body of quantitative and quantifiable data in connection with two or more variables which are then examined to detect patterns of association.

3.5.2 Questionnaire Design

The use of a questionnaire maybe described as an approach to collect systematic description of the existing phenomena in order to explain what is going on (Njoki, 2009). The primary data was obtained through the administration of questionnaires to contractors, officials in the National Housing Corporation and consumers of the government housing construction projects. The questions were both closed and open ended. The open ended questions provided for the identification of the delay causing
variables that may have missed out from the reviewed literature. The questions were based on past phenomena on the construction projects.

The researcher designed the questionnaire in such a way that the stratification of the data for analysis was easy. This facilitated viable and quick response from the target population. The questions administered involved recording the variables that cause delays and which were ranked on a rating scale. Most of these delay causing variables were identified through literature review both in Kenya and worldwide. More variables were identified through the open ended questions. In total, 10 variables were finally identified.

3.5.3 Interviews
Interviews are one of the most important sources of information. The administration of the questionnaires was supplemented by the interviews so as to get enough information necessary to achieve the study objectives. Those interviewed included officials from the National Housing Corporation, contractors of government housing construction projects and consumers of NHC housing products.

3.5.4 Secondary Data
The secondary data was obtained from books; both in the library and online, journals, magazines, daily papers and various Acts of Parliament. The secondary sources were used to supplement the findings of the research study.

3.6 Data Collection Procedures
The researcher delivered the questionnaires by hand to the offices of contractors, those contractors who were still on site, to officials in the NHC linked directly or indirectly with the housing construction projects and those people who have benefited in one way or another from these government housing construction projects. The researcher took with him an official letter from the department which served as an introduction. The letter also accompanied the questionnaires stipulating the objective of the research study and consequently assured the respondents that the information gathered was to be treated with high levels of confidentiality since the information is usually very critical. The information gathered was strictly used for academic purposes.
3.7 Data Presentation and Analysis

The qualitative and quantitative data was used during the analysis of the study and was organized in the most suitable format using the most efficient and effective technique. The quantitative data collected was presented in form of tables and percentages. The qualitative data was presented in form of photographs and texts. Then, analysis was carried out on the data and the results presented in a tabular form.

3.8 Challenges Faced During the Research

The researcher faced challenges which included:

- Limited funds to carry out a comprehensive research.
- Limited time to carry out the research, the study was to be completed within eight months.
- Sometimes even getting the respondents was not easy and some were not cooperative.
Figure 3.2: Framework for Data Analysis and Presentation.

Conceptual

Design Survey: Case Study

National Housing Corporation (NHC)

Data Collection:
1. Secondary data from documents
2. Primary data from questionnaires and interviews

Data Analysis:
Quantitative: Tables, Averages, Percentages, etc.
Qualitative: Descriptions in words and pictures

Findings

Recommendations

Conclusion

Source: Adapted from Waugh (1995), Geography: An Integrated Approach (2\textsuperscript{nd} Ed)
4.1 Introduction

This chapter deals with an in-depth analysis and presentation of the data collected during the study. The study sought to determine if delays are present in government housing construction projects, establish the possible causes of the delays as well as the impacts of the delays. It will later recommend on the possible ways to address these delays in government housing construction projects.

The research was carried out in Nairobi County on a sample of 70 respondents representing 18 from the National Housing Corporation officials, 12 from the contractors and 40 from the consumers of government housing construction projects, that is, tenants and purchasers. The researcher was able to successfully collect 48 questionnaires (69% collection) which have been analyzed and used in the presentation.

The following analysis and presentation is therefore fully based on the 48 questionnaires collected. The data is presented in a series of tables and pie charts, depending on the variation of data obtained and how this compared between the three target populations, to provide a visual representation of the obtained results.

4.2 Data Analysis

4.2.1 Level of Response Rate

The following table shows the target and number of respondents realized during the survey for the three different categories of questionnaires administered.
Table 4.1: Showing the target number and number of respondents realized as well as the percentage of each category

<table>
<thead>
<tr>
<th>Categories</th>
<th>Target</th>
<th>Realized</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHC Officials</td>
<td>18</td>
<td>12</td>
<td>67</td>
</tr>
<tr>
<td>Contractors</td>
<td>12</td>
<td>8</td>
<td>67</td>
</tr>
<tr>
<td>Project Users</td>
<td>40</td>
<td>28</td>
<td>70</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>70</strong></td>
<td><strong>48</strong></td>
<td><strong>69</strong></td>
</tr>
</tbody>
</table>

Source: Field Survey (2014)

4.3 National Housing Corporation Officials’ Analysis

The first questions defined the officials’ qualifications and positions in the corporation while the others sought to establish the causes of delays and the challenges faced in government housing construction projects.

4.3.1 Level of Education

Table 4.2: Showing the level of education by officials from NHC

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordinary Diploma</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>Higher Diploma</td>
<td>4</td>
<td>33</td>
</tr>
<tr>
<td>Degree</td>
<td>5</td>
<td>42</td>
</tr>
<tr>
<td>Advanced Degree</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Field Survey (2014)
The tables above shows that 42% of the questionnaires administered were answered by officials with a degree, 33% higher diploma holders, 17% ordinary diploma holders and 8% holding an advanced degree. This was necessary as it shows that majority of the respondents had the required knowledge to give the information required for this research study.

**Figure 4.1: Qualification held by the respondents**

![Pie chart showing the level of education of respondents]

- **Ordinary Diploma**: 42%
- **Higher Diploma**: 33%
- **Degree**: 17%
- **Advanced Degree**: 8%

**Source: Field Survey (2014)**

**4.3.2 Number of housing construction projects officials have been involved in.**

This question was administered to determine the experience in the field of government housing construction projects. This aided much in determining the relevance and viability of the information obtained from the NHC officials.
Table 4.3: Numbers of government housing construction projects the officials have been involved in.

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 5</td>
<td>7</td>
<td>58</td>
</tr>
<tr>
<td>6 to 10</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>&lt; 10</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Field Survey (2014)

The table above shows that 58% of the respondents were involved in projects ranging from 1-5, 25% in projects ranging from 6-10 and only 17% above 10 projects. This means that majority of the officials had been involved in less than five projects.

Figure 4.2: Numbers of housing projects the respondents involved in

Source: Field Survey (2014)
4.3.3 Position in the corporation and professional qualification

This question sought to determine the position of the respondents and the professional qualification too. This is important as it helps determine the viability of the official in carrying out the duties in the corporation. The study concentrated mainly on the technical department of the NHC as was the main department in charge of government housing construction projects. Most of the officials who responded to the questionnaires, their position in the corporation matched their professional qualification. 10 out of the 12 officials’ respondents, that is, 83% had their position in the corporation matching with their professional qualification with only 17% having their professional qualification not matching with the position they held in the corporation. However, the variation between the professional qualification and the position they held was not very diverse, with one a quantity surveyor serving as a project manager while the latter with no qualification of real estate serving as an estate manager. This question was important as it showed that most officials dealing with construction of housing projects were professional and thus could carry out their duties diligently.

Figure 4.3: Showing the relationship between position in the firm and professional qualification

Source: Field Survey (2014)
4.3.4 Delays Present

Delays are usually experienced in majority of construction projects due to a wide range of delay causing variables. This question was necessary to determine whether government housing construction projects are faced with delays and thereby give the researcher the green light to carry on with the study.

Table 4.4: Showing presence of delays in government housing construction projects.

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>12</td>
<td>100</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Field Survey (2014)

The NHC officials to whom the questionnaires were administered to indicated that 100% of the government housing construction projects they were involved in had been faced with one form of delays or another. The officials attributed the delays to the following factors:
4.3.5 Causes of Delays

Table 4.5: Causes of Delays

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Finance</td>
<td>10</td>
<td>33</td>
</tr>
<tr>
<td>Political Interference</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>Design Changes</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>Contractual Disputes</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Permits, Licenses</td>
<td>8</td>
<td>27</td>
</tr>
</tbody>
</table>

Source: Field Survey (2014)

Construction finance was the major delay causing variables followed by permits and licenses in government housing construction projects by the various NHC officials’ respondents with a percentage of 33% and 27% respectively. Sources of finance for NHC housing projects include: internal sources, borrowing from local financial institutions and internationally as well as contractor finance. All the above sources follow strict and stringent policies before lending thereby delaying projects.

These permits and licenses are a requirement before carrying out any construction work. They stem from the central government, county government, Kenya power & lighting company, National Environment Management Authority among others. Design changes, political interference and contractual disputes had a percentage of 17%, 13% and 10% respectively. Contractual disputes arise between the client and the contractor.
4.3.6 Tendering methods used in procurement

Tendering is the process of hiring a person or a firm to undertake construction works. This is a necessary step before the works can be executed. This question was necessary since the ability to optimize resources allocated to the project depends on how well the tendering process has been undertaken.
Table 4.6: Methods of tendering employed

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>9</td>
<td>75</td>
</tr>
<tr>
<td>Selective</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>Negotiated</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Field Survey (2014)

The above table shows that open system of tendering was the most common with a percentage of 75%. This is because NHC being a state institution was bound by government procurement rules and regulations, meaning that they must employ government procurement methods. Open system of tendering occurs when the whole population of potential contractors is invited to tender for the works through an advertisement in local or international newspapers. Open tendering is preferred as transparency is of paramount in public projects.

Selective tendering came second with a percentage of 17%, is a more common system for getting the contractor where there is need to control the quality of work.

Negotiated tendering was the least used with a percentage of 8%. Negotiated tendering involves inviting a particular firm to tender for the work thereby eliminating the issue of competition. However, there was some possibility that some of the contractors were single sourced but the officials could not disclose since single sourcing is discouraged in public sector tenders.
Figure 4.5: Method of tendering employed

Source: Field Survey (2014)

4.4 Contractors of government housing construction projects

Questions to the contractors were important to try and establish what caused delays on the part of the contractors. The first set of questions tried to define the contractor while the most important questions were related to delays in housing construction projects in which they have been involved in.

Out of the 12 questionnaires served to the contractors, the researcher was successfully able to collect 8 of them. This represented a 67% success rate.

4.4.1 Presence of Delays

This question was of dire need for the researcher to know if the research was viable or null. All of the contractors who responded to this question alluded to the face that the government housing construction projects they have undertaken have all suffered delays in one or another. This necessitated the research to try and establish the causes of these delays in government housing construction projects and also try and come up with recommendations on how to address these delays.
4.4.2 Causes of Delays

Table 4.7: Causes of delays

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction finance</td>
<td>8</td>
<td>26</td>
</tr>
<tr>
<td>Design changes</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>Weather conditions</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>Sub-contract works</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>Sub-soil conditions</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Contractual disputes</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Industrial disputes</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>31</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

*Source: Field Survey (2014)*

The contractors alluded that construction finance is the major delay causing variable in government housing construction projects with 26%. They argued that financing construction is a very important economic activity and is used to purchase labour, equipment and construction materials. Some of the contractors observed that sometimes the finance was available but the process of making payments to them was marred by bureaucratic procedures. For example, there were many signatories before the money could be authorized to the contractor. This affected the performance of the contractors and resulted to delays. Subcontract came second with a percentage of 19%, design changes 17%, weather conditions such as heavy rains contributed to 13% of the delays together with industrial disputes while sub-soil conditions and contractual disputes were the least delay causing variables with a percentage of 6% each.
Sub-contractors are engaged in projects to carry out specialized works such as electrical, plumbing, lifts, air conditioning among others.

Design changes refer to modification or addition of new works to the original design. These design changes are done by the project team for various reasons ranging from unworkable designs, change in ideas, changes in tastes and preferences or changes in prevailing market conditions.

Elements of weather that affect construction include rain and extreme temperatures. Weather, being a natural phenomenon may lack a prompt response thereby curtailing construction projects.

Subsoil conditions describe the conditions prevailing below ground on the site of construction and vary with the natural soil characteristics and affect construction of foundations, for example, black cotton soil.

Industrial disputes arise between the contractors and workers.

**Figure 4.6: Causes of delay as per the contractors**

<table>
<thead>
<tr>
<th>Causes of delays according to the contractors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction finance</td>
</tr>
<tr>
<td>Design changes</td>
</tr>
<tr>
<td>Weather conditions</td>
</tr>
<tr>
<td>Sub-contract works</td>
</tr>
<tr>
<td>Sub-soil conditions</td>
</tr>
<tr>
<td>Contractual disputes</td>
</tr>
<tr>
<td>Industrial disputes</td>
</tr>
</tbody>
</table>

**Source: Field Survey (2014)**
4.4.3 Tendering information, requirements, documents and cost to the contractors

The analysis of the above factors was necessary to ascertain how the contractors feel about each one of them. Though the NHC registers contractors to tender for its construction work, advertisement through the media which conforms to the public procurement rules is still the most preferred method of selection. 100% of the contractors obtained information requesting to tender through the media.

The table below shows how the contractors classified the tendering requirements and procedures in selection of the contractors.

**Table 4.8: Requirements for tendering and selection of the contractor**

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very strict</td>
<td>3</td>
<td>37.5</td>
</tr>
<tr>
<td>Strict</td>
<td>4</td>
<td>50</td>
</tr>
<tr>
<td>Fair</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>Lenient</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Too lenient</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**Source: Field Survey (2014)**

The above table shows that majority of the contractors view the requirements for tendering by NHC as very stringent with 37.5% and 50% of the respondents terming them as very strict and strict respectively.

Majority of the contractors were of the opinion that the number of documents required for tendering government housing construction work as too many. However, 5 of the 8 contractors who responded, that is, 62.5% said that the cost of preparing and printing those tender documents was fair.
**Figure 4.7: Requirements for tendering and selection of the contractor**

<table>
<thead>
<tr>
<th>Requirement for tendering and selection of the contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very strict: 37%</td>
</tr>
<tr>
<td>Strict: 50%</td>
</tr>
<tr>
<td>Fair: 13%</td>
</tr>
<tr>
<td>Lenient: 0%</td>
</tr>
<tr>
<td>Too lenient: 0%</td>
</tr>
</tbody>
</table>

**Source:** Field Survey (2014)

**4.5 Consumers of government housing construction projects**

The researcher felt that the research could not be conclusive without interviewing the consumers of the government construction housing projects on the quality and impacts to them as the beneficiaries.

The table in the next page shows the target number of respondents form the four housing projects selected together with the number of questionnaires that the researcher was able to successfully collect.
4.5.1 Response Rate

Table 4.9: Showing the response rates from consumers of government housing products

<table>
<thead>
<tr>
<th>Project</th>
<th>Target</th>
<th>Actual Obtained</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madaraka Infill</td>
<td>10</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>Pumwani</td>
<td>10</td>
<td>8</td>
<td>80</td>
</tr>
<tr>
<td>Dandora SSS</td>
<td>10</td>
<td>8</td>
<td>80</td>
</tr>
<tr>
<td>Nairobi West</td>
<td>10</td>
<td>7</td>
<td>70</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>40</td>
<td>28</td>
<td>70</td>
</tr>
</tbody>
</table>

Source: Field Survey (2014)

4.5.2 Satisfaction in terms of quality

Through this question, the researcher wanted to determine the quality of the construction project from the respondent’s point of view. The question further helped in determining whether the projects had fulfilled their intended purpose in terms of performance and value.

Table 4.10: Satisfaction in terms of quality

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very satisfied</td>
<td>6</td>
<td>21</td>
</tr>
<tr>
<td>Satisfied</td>
<td>15</td>
<td>54</td>
</tr>
<tr>
<td>Dissatisfied</td>
<td>5</td>
<td>18</td>
</tr>
<tr>
<td>Very dissatisfied</td>
<td>2</td>
<td>7</td>
</tr>
</tbody>
</table>

Source: Field Survey (2014)
From the table 21% of the respondents expressed utmost satisfaction in the quality of the projects. 54% were satisfied with the project, while those dissatisfied and those very dissatisfied had a percentage of 18 and 7 respectively. On average most respondents were satisfied with the quality of the projects.

**Figure 4.8: Satisfaction Level**

![Satisfaction Level in terms of quality](image)

**Source: Field Survey (2014)**

### 4.5.3 Impact of the housing construction projects to the beneficiaries

This question was intended to find out the level of impact the projects had on the respondents.

**Table 4.11: Confirmation on the impact of the projects to the beneficiaries**

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High impact</td>
<td>6</td>
<td>21</td>
</tr>
<tr>
<td>Medium impact</td>
<td>7</td>
<td>25</td>
</tr>
<tr>
<td>Low impact</td>
<td>15</td>
<td>54</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>100</td>
</tr>
</tbody>
</table>

**Source: Field Survey (2014)**
From the table above, a high number of respondents felt that the housing projects had not alleviated their earlier problems with 54%. Majority of these respondents were from the Dandora site and service scheme and Pumwani. Most of them felt that the cost of acquiring the houses was unreasonable plus most of the respondents were not involved in the project selection and design. In Pumwani phase one, under tenant purchase method the respondents were required to pay Ksh.10,000 per month for 18 years which many of them felt was too much considering many are unemployed. Only 21% of the respondents felt that the projects had a high impact and these were mainly from upper income class who purchased their houses through direct mortgages and were mainly derived from Madaraka infill.

**Figure 4.9: Impact of the housing construction projects to the consumers of those projects**

![Impact of government housing projects to the beneficiaries](image)

**Source:** Field Survey (2014)
CHAPTER FIVE

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This study aimed at investigating the causes of delays in government housing construction projects (A case study of the National Housing Corporation-Nairobi County). After a comprehensive review of the literature and field work, this chapter synthesizes and ties the data acquired in data analysis and presentation into research findings that inform the research objectives. The specific objectives of the study were:

- To investigate the causes of delays in government housing construction projects.
- To analyze the impacts of delays in government housing construction projects.
- To make recommendations on how to address these delays in government housing construction projects.

The research was to address the following questions:

- What are causes of delays in government housing construction projects?
- What are the impacts of delays in government housing construction projects?
- What are the recommendations on how to address these delays in government housing construction projects?

The chapter starts by giving a brief summary of the study. The chapter then gives conclusions emanating from the research findings, makes recommendations on how delays in government housing construction projects can be addressed. The chapter then finally makes suggestions on areas of further study.

5.2 Findings and conclusion

As a conclusion, this study has successfully identified and met the three objectives that were previously stated:
5.2.1 Objective (i): To investigate the causes of delays in government housing construction projects;

This objective was achieved both through the review of the relevant literature and also through the field survey. The researcher through the field survey positively established that the various delay causing variables such as construction finance, political interference, design changes, permits and licenses that were enumerated in the literature review, truly exist and are the ones that have resulted to delays in government housing construction projects. The research found that delays in government housing construction projects were causes by the following factors; construction finance, sub-contractors, design changes, elements of weather, subsoil conditions, industrial disputes, political interference, contractual disputes and permits and licenses. Majority of the respondents, both from NHC and contractors attributed delays in government housing construction projects to issues of finance. Therefore, the research conclusion is that construction finance is the major delay causing variable in government housing construction projects.

5.2.2 Objective (ii): To analyze the impact of delays in government housing construction projects;

Some of the literature reviewed by the researcher and form the field work it’s established that delays in government housing construction projects have in many instances impacted negatively. For examples, delays in government construction projects have led to variation between the contract sum and the final cost. Cost performance in any project is of paramount importance as we have seen from objective (i) that construction finance is one of the major causes of delays in government housing construction projects. Another impact of delays is time performance, government housing construction projects are normally not finished as per the duration set in the contract as are often extended. This leads to increased costs and also low cost recovery for the said projects thereby affecting the overall performance of ability of the government to provide housing to the members of the public. Delays in government housing construction projects also impacts negatively on the quality of the finished product. Due to the above negative impacts there is a dire need to address the causes of delays in government housing construction projects.
5.2.3 Objective (iii): To make recommendations on how to address these delays in government housing construction projects;

Having identified the causes of delays in government housing construction projects and the impacts of these delays, the researcher sought to give out recommendations on the way forward. Section 5.4 below takes in the researcher’s recommendations that will facilitate achievement of the main aim of this research work.

5.3 Hypothesis Testing

The hypothesis of the study was that the major delays experienced in government housing construction projects are due to the bureaucratic and lengthy regulatory procedures that control the construction industry. The findings of the research do not support this hypothesis since the researcher found out that construction finance is the main cause of delays in government housing construction delays. However, the bureaucratic and lengthy regulatory procedures that control the construction industry do also play a significant role as a delay causing variable in government housing construction projects.

5.4 Recommendations

The causes of delays in government housing construction projects undertaken by the National Housing Corporation have been identified in the foregoing discussions. Therefore, for the study to be considered complete and successful there is also need for possible solutions to these delay causing variables. It is for this reason that the following recommendations are made. These recommendations are related to the research findings, which have outlined the causes and impacts of delays in government housing construction projects. The recommendations therefore are as follows:

1. The number of signatories required to authorize payment of interim certificates to the contractor should be reduced. This will enhance performance on the part of the contractor as he/she will have finance readily available and on time to enable him/her carry out the works without any delays.

2. Introduction of housing infrastructure bonds. These are bonds issued by the government to raise funds that will be used for development of housing projects.
They are like other bonds available in the market, the only difference being the fact that the funds collected will be used for development of housing projects.

3. The National Housing Corporation should improve their financial management systems. This will enable the corporation to pay the contractors in a timely manner.

4. Bureaucracy and red tape should be reduced by the financial lending institutions entrusted by NHC to lend the money. Nairobi West project was funded through money borrowed from the National Bank while Madaraka CD was funded through money borrowed from co-operative bank.

5. Enhancing partnerships in housing construction projects. The Mavoko project which is a public-private partnership between NHC and Iranian investors was found to perform well.

6. Enhanced access to adequate and quality finance to the National Housing Corporation. This could be achieved through; adequate financial systems, lenient lending criteria and structures that support borrowing to develop housing construction projects for low income earners.

5.5 Areas of Further Research

1. An investigation into the effectiveness of the private sector in assessing and trying to reduce the gap between the supply by the government and the demand.

2. Effects of the delays in government housing construction projects to the realization of Vision 2030.

3. Impacts of partnerships between the government and the various stakeholders on housing provision.
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Republic of Kenya; *Building code and by-laws*


I am a fourth year real estate student at the University of Nairobi carrying out a research study on the causes of delays in government housing construction projects: The information given will be treated as confidential and shall be used for no other purposes but for this research study only.

**Please circle and / or state the appropriate answer in the bracket(s) or space(s) provided. More than one answer may be ticked or stated where applicable.**

1. What is your professional occupation?

2. What is your position in the corporation?

3. Kindly tick the level of your education
   a) Ordinary Diploma
   b) Higher Diploma
   c) Degree
   d) Advanced degree

4. How many housing construction projects are you involved in since joining the corporation?
   a) 1-5
   b) 6-10
   c) Above 10

5. Are the projects faced by any delay?
   a) Yes
   b) No
6. If yes, please tick which among the following factors may have caused the delay?
   a) Construction finance
   b) Permits/ licenses
   c) Political interference
   d) Design changes
   e) Contractual disputes
   f) Others
      (specify)........................................................................................................

7. In your opinion do you think there are enough professionals in NHC?
   a) Yes
   b) No

8. Which among the following tendering methods are used in procurement?
   a) Open
   b) Selective
   c) Negotiated

9. Does NHC have a construction policy?
   a) Yes
   b) No

10. If yes, who develops the policy?
     ............................................................................................................................
11. What are some of the policies that regulate construction activities in NHC?

……………………………………………………………………………………………………………………………………………………………………

12. Are approved drawing used for the projects?
   a) Yes
   b) No

13. If yes, how do you acquire them?

……………………………………………………………………………………………………………………………………………………………………

14. What are the challenges faced in coming up with government housing construction projects?

……………………………………………………………………………………………………………………………………………………………………

15. What is your general view on the level of professionalism in the construction of government housing projects and the level of adherence to the public procurement and disposal act?

……………………………………………………………………………………………………………………………………………………………………

THANK YOU FOR YOUR RESPONSE
APPENDIX B

QUESTIONNAIRE TO THE CONTRACTORS INVOLVED IN GOVERNMENT HOUSING CONSTRUCTION PROJECTS

I am a fourth year real estate student at the University of Nairobi carrying out a research study on the causes of delays in government housing construction projects: a case study of National Housing Corporation projects in Nairobi County. The information given will be treated as confidential and shall be used for no other purposes but for this research study only.

Please circle and / or state the appropriate answer in the bracket(s) or space(s) provided. More than one answer may be ticked or stated where applicable.

1. What is the name of your firm?

........................................................................................................................................................................

2. What is your position in the firm?

........................................................................................................................................................................

3. What type of construction does your firm engage in?
   a) General
   b) Civil

4. How many government housing construction projects have you been involved since joining the construction firm?
   a) < 1
   b) > 1 but < 5
   c) > 5
5. Are the projects faced by any form of delay?
   a) Yes  
   b) No

5b. if yes, please tick which among the following factors may have caused the delay?
   (Tick the most significant delay causing variable)
   a) Construction finance  
   b) Design changes  
   c) Sub-contract works  
   d) Sub-soil conditions  
   e) Contractual disputes  
   f) Others (specify)

6. How would you rate the requirements for tendering by the government?
   a) Very strict  
   b) Strict  
   c) Fair  
   d) Lenient  
   e) Too lenient

7. What is your view on the following issues on tendering? (comment either fair or unfair)
   a) Tendering information
   b) Documents required
   c) Cost to the contractor

THANK YOU FOR YOUR RESPONSE
APPENDIX C

QUESTIONNAIRE TO THE CONSUMERS OF GOVERNMENT HOUSING CONSTRUCTION PROJECTS

I am a fourth year real estate student at the University of Nairobi carrying out a research study on the causes of delays in government housing construction projects: a case study of National Housing Corporation projects in Nairobi County. The information given will be treated as confidential and shall be used for no other purposes but for this research study only.

Please circle and / or state the appropriate answer in the bracket(s) or space(s) provided. More than one answer may be ticked or stated where applicable.

1. Project name

2. Gender of person interviewed
   a) Male
   b) Female

3. Age of person interviewed……………………………………………………………………………….years

4. Occupation
   a) Government employee
   b) Private sector employee
   c) Business man/woman
   d) Farmer
   e) Other (explain)

………………………………………………………………………………………………………………………….
5. Was the project selected as a priority for this community?
   a) Yes
   b) No
   c) Do not know

6. Did you or people you know in the community participate in project implementation?
   a) Yes, community participated
   b) No, community did not participate
   c) Do not know

7. What is your satisfaction in terms of quality of the project, time spent on the project and value for money spent on this project?
   a) Very satisfied
   b) Satisfied
   c) Dissatisfied
   d) Very dissatisfied

8. If Dissatisfied or Very dissatisfied, explain why?
   …………………………………………………………………………………………………
   ……………………………………………………………………………………………

9. How would you rate the project in terms of impact on beneficiaries?
   a) High impact-many people in community benefited
   b) Medium impact-some people in community benefited
   c) Low impact-none/few people in community benefited

10. Can you suggest ways to enhance construction of NHC housing projects?
    ………………………………………………………………………………………………

THANK YOU FOR YOUR RESPONSE