

**A STUDY ON THE IMPACT OF CONTRACTOR-SUBCONTRACTOR  
RELATIONSHIPS ON THE PERFORMANCE OF CONSTRUCTION  
PROJECTS**

**A Case Study of the Kenyan Construction Industry**

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**NOVEMBER, 2012**

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I hereby declare that this project is my original work and has not been presented for a degree in any other University.

Signature .....



Date .....

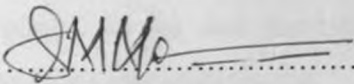
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## DEDICATION

My family has paid the greatest price for my achievements in this journey and are the ones to whom I dedicate this research project. My mum Jane Nzoloi and dad Justus Muinde, for their encouragement during the years of study, they have dealt with the highs and lows of the entire process and continued to show unconditional love and support—despite the challenges. I would not have been able to accomplish this work without their tremendous devotion and for that, I am most grateful.

## ABSTRACT

Subcontracting in the construction industry has greatly increased in recent years. In most construction projects, especially building projects, it is common for 80 to 90% of the work to be performed by subcontractors. Subcontracting is used much more extensively on housing and building construction projects than on engineering and industrial projects (Clough, Richard & Sears 1994).

There is evidence that constructions project performance in Kenya is poor. An important component of the project life cycle is the chain supply management function whose aim is the coordination of all parties to meet the objectives of the project. The involvement of subcontractors in a building construction project results to relationship with the main contractor and this may have an influence on the performance of the construction projects.

The aim of the study was to investigate the effect of main contractor-subcontractor relationship in performance of a construction project. The study adopted descriptive survey techniques to examine the underlying factors influencing the relationship between main contractors and subcontractors with a view to determining their effect on the performance of construction projects.

The findings of the study confirmed that most contractors (90%) depend on subcontractors for execution of their works and therefore procurement and management of subcontractors highly affects the performance of construction projects. It further established that 70-90% of the work is performed by subcontractors. The main reasons contractors engaged subcontractors were to provide skilled labour, reduce overhead costs and minimise work and financial pressure on the contractors.

The study recommends for cooperative relationships and mainly integration of subcontractors into partnering approach in order to reduce adversarial relationships. In addition, simplified and comprehensive subcontracts would improve relationship between main contractors and subcontractors for effective construction project performance.

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## **GLOSSARY OF ACRONYMS**

<b>AAK</b>	-	Architectural Association of Kenya
<b>AGC</b>	-	Agreement and General Conditions
<b>AHP</b>	-	Analytical Hierarchy Process
<b>BORAQS</b>	-	Board of Registration of Architects and Quantity Surveyors
<b>ASCE</b>	-	American Society of Civil Engineers
<b>FIDIC</b>	-	Federation of Civil Engineering Contractors
<b>GDCFC</b>	-	Gross Domestic Fixed Capital Formation
<b>GDP</b>	-	Gross Domestic Product
<b>GDPCF</b>	-	Gross Domestic Product Capital Formation
<b>HVAC</b>	-	Heating Ventilation and Air conditioning
<b>JBC</b>	-	Joint Building Council
<b>KABCEC</b>	-	Kenya Association of Building and Civil Engineering Contractors
<b>MC</b>	-	Main contractors
<b>MOPW</b>	-	Ministry of Public Works
<b>MR</b>	-	Mean Rate
<b>OECD</b>	-	Organisation for Economic Co-operation and Development
<b>SC</b>	-	Subcontractors
<b>SPSS</b>	-	Statistical Packages for Social Sciences
<b>TR</b>	-	Total Response
<b>U.S/U.S.A</b>	-	United States of America

- U.K** - United Kingdom
- UNIDO** - United Nations Industrial Development Organisation
- UNRWA** - United Nations Relief and Works Agency

# CHAPTER ONE: THE PROBLEM AND ITS SETTING

## 1.1 INTRODUCTION AND BACKGROUND OF STUDY

The construction industry is generally defined as economic activities that focus on the construction of physical structures such as buildings and infrastructure, regardless of the construction being land or marine based (Kale & Arditi, 2001). The industry represents one of the most dynamic and complex industrial developments in the world.

Its complexity is characterised by the large number of participants including the owners (clients), contractors, subcontractors, consultants, regulators and other stakeholders, each of whom have different targets and objectives but have to collaborate in order to complete the project successfully.

The industry plays a major role in the development and achievement of society's goals. Output from the industry is a major and integral part of the national output, accounting for a sizeable proportion in the Gross Domestic Product (GDP) of both developed and underdeveloped countries (Crosthwaite, 2000). The importance of the construction industry can be seen from the following statistics in a developed country like United Kingdom (UK). In 1983, it contributed 9-10% of the Gross Domestic Product (GDP); 50-60% of the Gross Domestic Fixed Capital Formation (GDCFC); and 6% of the Total Wage Employment (Hillebrandt, 1985). In 1993, the industry contributed 10% of the Gross Domestic Product (GDP), 50% of the Gross Fixed Domestic Capital Formation (GDCFC) and 14% of the Employed workforce. These figures are more or less the same in most advanced and developing economies of the world (Kwakye, 1997). In Kenya, the construction industry is one of the main economic engine sectors supporting the Kenyan national economy by contributing significantly to the GDP. The construction products provide the necessary public infrastructure and private physical structures for many productive activities such as services, commerce, utilities and other industries.

The industry is not only important for its finished product, but it also employs a large number of people (directly and indirectly) and therefore has an effect on the economy of a country/region during the actual construction process. Table 1:1 presents the contribution of the construction

industry to GDP, GDPCF, Wage Employment and Labour Earnings for the period 2007 to 2011. Given this importance, it is necessary that the performance of the industry is efficient so that its contribution is not compromised.

**Table 1:1: Contribution of the Construction Industry**

Year	2007	2008	2009	2010	2011
GDP (%)	4.24	4.25	4.35	4.47	4.53
GDPCF (%)	7.48	9.14	8.78	8.96	9.49
GDPCF by Type of Asset (%)	24.52	25.68	25.72	24.59	23.46
Wage Employment (%)	4.68	4.63	4.57	4.50	4.43
Labour Earnings (%)	4.03	4.04	3.96	3.91	3.92

Source: Statistical abstract: Republic of Kenya, Government Printers, 2012

However, comparatively the contributions of the industry are lower in the Kenyan context than those of advanced and developed economies of the world. Hence, there is need for a well managed construction industry so that its contributions are enhanced. Many construction projects report late completion, cost overruns and poor quality standards due to many project-specific causes such as unavailability of materials, excessive amendments of design and drawings, poor coordination among participants including contractors and subcontractors, ineffective monitoring and feedback and lack of project leadership skills (UNRWA, 2006).

### 1.1.1 COMPLEXITY IN CONSTRUCTION

Construction is characterised by particular complexity factors owing to the industry specific uncertainties, interdependencies and inefficiency in operations. Project complexity (difficulty in handling a project) is best understood by analyzing the factors within the construction process and their interactions (Bennet, 1985). In a construction project, two aspects of complexity can be identified; physical complexity and managerial complexity. Physical complexity refer to the



complication arising from design parameters (plans shapes, storey heights etc) while managerial complexity refer to difficulties of coordination and efficiency within the project.

Gidado (1996) argues that complexity in construction originates from a number of sources; the resources that are employed, the environment in which construction takes place, the level of technical knowledge required, and the number and interaction of different parts in the workflow. The complexity relate to *uncertainty* and the second stems from *interdependence* among tasks that 'originate from bringing different parts together to form a work flow' (ibid: 215). A construction project itself as an assembly-like process is often complicated, parallel and dynamic. All supplies are believed to be made in accordance with the project's unreliable schedule, and all resources such as equipment and crew are supposed to stand by, ready for the project's beck and call. The uncertainty in construction has four dimensions: lack of complete specifications for construction activities on site, lack of uniformity of materials, work, and players with regard to place and time "every project is unique" and unpredictability of environment.

The industry is highly fragmented and its firms should co-operate in ever changing patterns. In addition, the project and the construction site form a highly transient social system, mobile workforce due to seasonal workflow. These conditions shape the industry's way of functioning and its performance. The conditions call for co-ordination which has meant first, 'the organization of the production work force into a variety of trades' and second, 'the practice of subcontracting portions of a project to special trade contractors by primary contractors' (Eccles, 1981).

Major construction projects involve a complex sequence of interdependent tasks that require different types of specialist workers. The level and types of specialist skills used vary over the life of the project. With such complexity, the contractor finds himself in a situation where he is not capable of executing some of the works to the best of the client's requirements due to the different categories of skills, size, nature and complexity of the project required for such works hence he sublets those portions of the works to the subcontractors (Kigo, 2007). Some of the

works sublet include plumbing and electrical installations, joinery works, carpentry, lift installations and structured cabling (Seeley, 1997). Gidado (1996) argues that there is a continuous increase in the complexity of construction projects. Firms are decentralizing their jobs more and more, allowing subcontracting to become a basic part of the work organization.

### **1.1.2 RELATIONSHIPS IN THE CONSTRUCTION INDUSTRY**

The construction industry has many players who relate through contractual and operational arrangements to achieve the objective of the project. The main parties in a construction contract are the client/employer and the contractor. The Client also has relationship with his consultants who are responsible for production of the clients brief into design/drawings. Other relationships created in a project include the consultants/contractor relationship, contractor/supplier relationship and also contractor/subcontractor relationship. As earlier noted, implementers of a project at the site, play a key role in determining the performance of the project with respect to satisfaction of the client. The success or failure of a project is highly determined by its completion within the stipulated time, the outlined budget and to the quality of the end product as desired by the stakeholders, in terms of its functionality and intended usage. To an extent, the success of a project is also related to the degree of collaboration and coordination existing among the actors involved.

Main contractor-subcontractor relationships are often found to be strained and adversarial (Dainty, Briscoe & Millett, 2001). Their relationship is governed by their contract, their motivations and the operational management arrangement that are put in place to direct the synergy of the relationship to specific project objectives.

### **1.1.3 MANAGING RELATIONSHIPS THROUGH CONTRACTS**

A construction contract is best described as a complex web of competing interests. It provides flexibility and simplicity. Its success also depends on the parties building long-term relationships. In such a case the contract may well serve only as document to record the intentions of parties. There exist various forms of contracts between the players in the construction industry.

A general contractor/subcontractor relationship is collaborative because both parties have a common purpose - project completion on budget and schedule. The parties' relationships depend on the kind of contract in place.

Nowadays, most general contractors opt for subcontracting (Lehtonen, 1998) for various reasons such as:

- i. On highly complex projects that require large capital outlay.
- ii. Where specialization require great internal technical differentiation.
- iii. Due to fluctuating nature of workload for contractors. Contractors to an ever increasing extent are reducing their dependence on directly employed labour.
- iv. Subcontract arrangement enables the contractor to effectively allocate risk outside its own organization.

## **1.2 THE PROBLEM STATEMENT**

The construction industry is complex. In the building construction sub-sector, modern day requirement for comfort, convenience and aesthetics has brought about the need for the incorporation of engineering services and the introduction of proprietary and other complex materials and fittings in buildings.

Kigo (2007) acknowledges the existence of a gap between main contractors and nominated subcontractors and suggests that a study be undertaken to establish ways of enhancing relationship between main contractor and subcontractors for improved project performance.

Subcontractors' performance or non-performance, inevitably impacts on the performance of the industry as a whole. Meanwhile, subcontracting is a double-edged sword. If managed effectively, subcontractors help their contractors improve on project performance that lead to increased client satisfaction, an improvement on the reputation of contractors and hence their competitiveness in the market (Dainty, Briscoe & Millett, 2001). Therefore, the results of this study will enable main contractors and subcontractors improve their efficiency in project performance in the industry.

Involvement of subcontractors introduces management challenges which affect the performance of projects in various ways. Therefore, the question that this study seeks to address is *'What are the problems associated with subcontracting in the building sub-sector in the construction industry and how do the problems affect the performance of projects?'*

### **1.3 OBJECTIVES OF THE STUDY**

The objectives of this study are:

- i. To find out the specific reasons why building contractors in the Kenyan construction industry subcontract work and identify the scope of the subcontracted works.
- ii. To find out how clients (Employers) and contractors procure subcontractors and study the contract arrangements made between main contractors and subcontractors.
- iii. To identify contractual and operational challenges that face both main contractors and subcontractors in a building project.

### **1.4 HYPOTHESIS**

The research question posed in this study is designed to bring out the experiences related to subcontracting in the Kenyan construction industry and how that relates to performance of the players. The null hypotheses ( $H_0$ ) and alternate hypotheses ( $H_A$ ) that guide the study are presented as:

$H_0$  Contractor-subcontractor relationship does not affect the contract performance in building construction projects

$H_A$  Contractor-subcontractor relationship affects the contract performance in building construction projects

### **1.5 JUSTIFICATION AND IMPORTANCE OF THE STUDY**

Mbatha (1986) notes subcontractors as the main cause of delay in projects. Time overruns cause significant cost overruns by way of price escalations and contractual claims and lead to loss of revenue for not being able to deliver the project and for its returns, on time. Kale & Arditi (2001) argues that contract performance is strongly associated with the relationship between main contractor and subcontractors.

The performance of construction projects in Kenya has continued to face the challenges of late completion; poor quality resulting to collapse of buildings, stalling of projects partly due to inadequate capacity to complete by the contractor. A recent happening in Kenya is an example where in less than a week after the Architectural Association of Kenya warned that 65% of structures in the country are substandard, eleven people have died after a three-storey building collapsed in Kiambu. The building site in Kiambu was located on the outskirts of the capital and experts have claimed that irresponsible contractors may be to blame. The bodies of three men were pulled from the rubble, while a woman was found crushed to death. A member of the Institution of Engineers of Kenya said that the organisation was receiving almost daily reports of buildings collapsing because of poor construction. It was alleged the building collapsed because of its substandard construction material and poor workmanship (Gichuhi, 2010).

Subcontractors will also realize the need for mutually beneficial relationships with enhanced coordination and co-operation for better performance of projects. The Employers and Consultants in the construction industry will greatly appreciate how subcontracting can improve the performance of a project and therefore seek to embrace the practice. Generally, conclusions of the study will have an implication in the construction business which shall affect operations of other stakeholders in the industry.

## **1.6 SCOPE AND LIMITATIONS OF STUDY**

This study is limited to the effects that the relationship between contractors and subcontractors has on the achievement of set project parameters. Contractual and operational relationships are studied. While acknowledging that there are many factors that affect project performance besides the relationship of the two parties, the study could not cover those other factors due to time and resource constraints.

In the construction industry, usually projects of big magnitude can and do have scope for subcontracting. This research project is limited to a study of construction projects with a contractual sum of Kenya Shillings Fifty Million (Ksh.50,000,000) and above. This is because bigger projects which are undertaken by larger contractors provide a better more formed

subcontracting approach which more readily renders itself to a study of this nature. The study focused on construction firms with physical addresses of Nairobi for ease of data collection.

## 1.7 RESEARCH DESIGN AND METHODOLOGY

The methodology adopted by the researcher is greatly influenced by the objectives of the study.

### 1.7.1 DATA COLLECTION

The researcher collected primary data from main contractors, specialist contractors and architectural firms by administering survey questionnaires to a sample population. The questionnaires consider both the recently completed and on-going projects and experiences by the parties on various construction contracts.

### 1.7.2 DATA ANALYSIS

The primary data collected is organised and presented in form of tables, charts and graphs depending on the suitability of the tool and data being handled at any one time. The analysis of the data is mainly descriptive and percentages are used to compare the data.

## 1.8 OPERATIONAL DEFINITIONS

In this study the following terms and the meanings are as given:

**Main contractor** – It is the prime or the general contractor who subcontracts work to the subcontractors.

**Subcontractor** – the specialist contractors in the building industry – electrical, mechanical, lifts, roofing, air conditioning contractors etc

**Construction Project Performance** – It is the eventual completion of a project within the originally set contract period, budget and specifications.

**Relationship** – the working or operational and contractual relationship between main contractor and subcontractor

**Project** – is a non-routine undertaking with a definite time, budget and specifications (Mbatha, 1986).

**Project delays** – The extra time incurred over and above the originally set contract period (Mbatha, 1986).

**Subcontract arrangement** – The form of contract agreement between main contractors and subcontractors

## **1.9 ORGANISATION OF THE REST OF THE REPORT**

The study is organized in four parts.

Chapter one gives a general introduction that includes background of the study and introduction of the research area, problem statement and the study objectives. It also states the hypothesis which delineates the scope of the research as well as giving a justification for the study. It ends with this part which explains how the report is laid out.

Chapter two forms the theoretical basis of the study. In this section, literature is reviewed related to construction contracting with respect to history of contracting, methods of contracting, procurement methods for subcontractors and the various aspects of subcontracting. The literature review forms the basis of evaluation of the primary data to enable the researcher arrive at conclusions for the research.

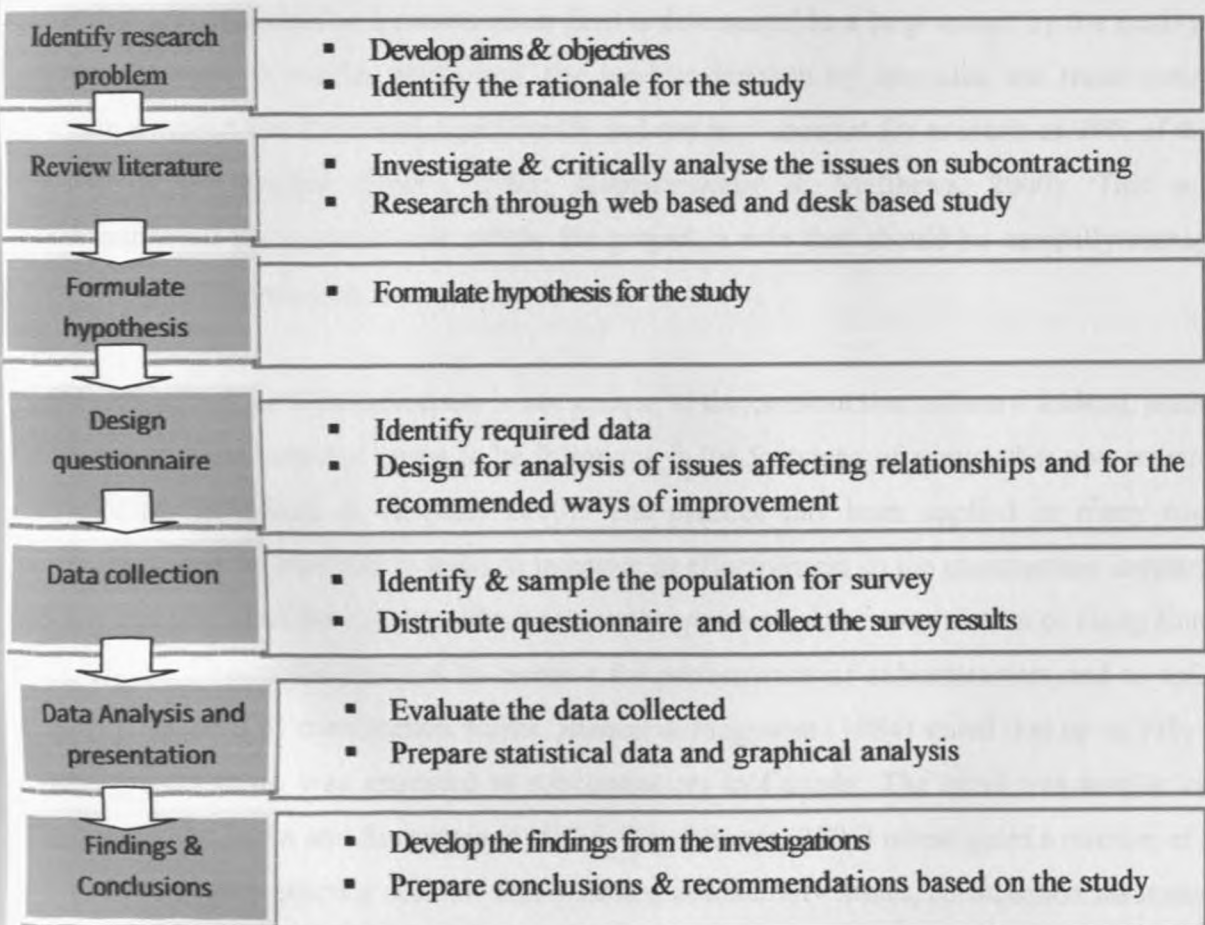
Chapter three outlines the research methodology of the study. This chapter explains the research design adopted for the study, the type of sampling method used, data collection method and sampling tools then data presentation and analysis techniques.

Chapter four contains the actual data collected from the field. It gives the findings of the research. In this chapter, facts from the field are evaluated against the theoretical propositions in chapter two in the light of the objectives of the study. The hypothesis of the study is tested at end of this chapter.

Chapter five is the final part that gives the findings and conclusions of the study. This chapter also presents the recommendations of the study.

### 1.8.1 RESEARCH PROCESS

The research process explains the strategy for the study. The initial research on the subject area was studied in order to establish the objectives, hypothesis of the study and the rationale for the research. Depending on the initial research, an extensive study on the literature review was undertaken. The study involved investigating previous researches to examine and establish the bases for the subsequent, detailed work and finding the necessary alternatives, data collection through means of investigation with various construction and architectural firms in Kenya. An analysis of the findings then followed. A field survey was conducted to investigate the current practises and the respondents' thoughts and perceptions on the research subject. The data obtained from the survey was evaluated. The analysis made from the study then provided the conclusion and recommendations of the research. Figure 1.1 below shows process of the study.



**Figure 1.1: Research Process**

Source: Own Construct, 2012



# CHAPTER TWO: LITERATURE REVIEW

## 2.0 INTRODUCTION

It is common for about 80 percent to 90 percent of the work in building construction to be performed by subcontractors (Ng Chu, 2006). Despite much work having been conducted to reduce the impact of issues which manifest in time and cost overruns, increased litigation and inability to meet client requirements still trouble the industry and limit its success (Mulvey, 1998). Globalisation too, has lifted the standards and levels of sophistication expected by construction clients (Thompson & Sanders, 1998; Masterman, 1992) and construction companies need to improve the way they work to meet those demands. This efficiency leads to better project outcomes including projects that finish on time, to budget and with near zero defects. However, the delivery capability of a construction firm is determined to a large extent by the quality of its subcontractors. As earlier mentioned, the work undertaken by specialist and trade contractors within a project has increased significantly and can now account for as much as 90% of the total value of the project (Nobbs, 1993; Kumaraswamy & Matthews, 2000). This suggests subcontractors play a vital role within the project, a role that should be carefully managed to ensure optimal outcomes.

Sub-contracting as a phenomenon is not unique to the construction industry. Indeed, practice in the construction industry seems to be following in the footsteps of many other non-construction businesses (Murdoch & Hughes, 2000). The practice has been applied in many countries arousing need for research in ways to improve its effectiveness in the construction industry. (Ng Chu, 2006) studied the practice of subcontractor appraisal in the construction of Hong Kong. He developed a common standard to monitor the performance of subcontractors and to uplift the quality standard of construction works. Russell & McGowan (1984) stated that up to 95% of the total project value was entrusted to subcontractors in Canada. The trend was similar in Asia countries like Japan and Singapore. Arditi & Chotibhongs (2005) investigated a number of issues in subcontracting practice such as: safety issues, productivity issues, construction insurance, and subcontracting bonding.

Cost, time and quality are the three most important parameters of project performance. In today's highly competitive and uncertain business environment, clients are demanding for better value from their investment. They want their project to be completed on time, within the estimated cost and with the right quality. It is envisaged that more and more specialist works will be employed in modern buildings for enhancing performance and sustainability. Subcontracting has become a common trend in the construction industry today (Seeley, 1997).

This study seeks to investigate the impact of contractor-subcontractor relationship in the performance of construction projects. The following literature discusses the various aspects regarding subcontracting in the construction industry and their impact on performance of construction projects.

## **2.10 SUBCONTRACTING**

### **2.1.1 DEFINITION OF SUBCONTRACTING**

Frank (1998) defines subcontracting process as the method of construction organization under which the prime contractor is allowed to and frequently performs, some or even much of its contractual obligations through other contracting entities (the subcontractors). Subcontracting forms an integral part of the building process in Kenya. The effectiveness of subcontracting is directly influenced by the contractual relationship between the main contractor and the subcontractor .

Subcontractor is a person or business which has a contract (as an "independent contractor" and not an employee) with a contractor to provide some portion of the work or services on a project which the contractor has agreed to perform. In building construction, subcontractors may include such trades as plumbing, electrical, roofing, cement work and plastering. In this study the following definition for subcontracting is applied: subcontracting occurs when a firm (the contractor or principal that is engaged to execute certain works), contracts with another firm (the subcontractor), for execution of construction related works, according to the project specifications.

Subcontracting relationships are usually formalised by way of explicit contractual relationships. When discussing subcontracting in the construction sector, one has to realise that many enterprises act both as subcontractor and as main contractor, there is not always a strict distinction between main contractors and subcontractors. This situation may occur at the same time but in different projects. Depending on the size of the project, the characteristics of the product, the necessary qualifications of the personnel, and the equipment needed to realise the project, they may decide to operate as main contractor (and hire subcontractors to do part of the job) or to opt for a subcontractor role.

### **2.1.2 THE LEGAL BASIS OF SUBCONTRACTING**

In contract law, where there is a contract between A and B, A may not simply decide to be replaced by C. If A wishes to hand over all rights and obligations to C, and then simply drop out of the picture, there must be a novation. A novation is a contract that transfers both rights and obligations from one of the original parties to a new party. An assignment, on the other hand, occurs where an original party transfers only contractual rights. For example, a contractor might wish to assign to a bank the future rights to be paid under a particular building contract, as security for a loan from the bank. The law of contract permits assignments in principle, but this is subject to any terms in the particular contract. Leaving aside the issues of novation and assignment, there is the possibility that a party may wish to have its contractual obligations carried out by someone else, while remaining legally responsible for the performance of those obligations. This is known as vicarious performance and, in principle, it is quite acceptable. However, it will not be permitted where the contracting party has been specifically selected for some personal qualification, skill or competence.

In a contract in the building subsector, vicarious performance is impliedly ruled out in respect of jobs calling for highly specialized skills. While the physical work of construction can be delegated, managerial functions (i.e. the coordination and control of the entire project) may not be, at least where an employer and a contractor have an on-going business relationship. Most modern standard-form contracts puts express limits on the extent to which the main contractor may satisfy contractual obligations through the medium of subcontractors. For example, in the

JBC contract, Clause 19.2.2 provides that 'the Contractor shall not without the written consent of the Contract Administrator (which consent shall not be unreasonably withheld) sub-let any portion of the Works'. This is reinforced by clause 19.4, which provides further that any sub-contract must contain certain conditions that are designed to protect the employer's position. The importance attached to this clause is shown by the fact that unauthorized sub-letting is a ground for the employer to determine the contractor's employment.

In practice, contractors may assign or sublet their works to a subcontractor. The Contractor shall not sublet the whole of the Works without the written consent of the employer and the Architect. He may sub-let part of the Works upon giving notice to the Architect (JBC, 1999). The Contractor shall remain liable under the contract for all work sublet as if he had himself carried out such work. With regard to sub-letting, according to JBC (1999), neither the Employer nor the Contractor shall, without the written consent of the other, assign a contract

### **2.1.3 HISTORY OF SUBCONTRACTING**

Subcontracting has existed since time immemorial but it became an increasingly popular practice in Kenya in the 1960s and has over the years established itself as an integral part of the industry's production process. Subcontracting is particularly popular in the building sector where subcontractors perform about 90% of all construction work (Mansfield, 1988). The reasons behind the development of subcontracting are numerous and are attributed not only to needs of the construction industry but also the changing economic times later addressed in this study.

In early times, contractors found the periods of economic downturn difficult to manage with large directly employed workforce, particularly when inflation, interest rates and the level of industrial disputation were high. Subcontracting provided contractors with the opportunity to significantly overhead costs by downsizing the labour force. Construction projects have since 1960's become more complex in their design, construction and procurement. This complexity was reflected in the unique shape and the extra height of projects, the use of new materials, plant and construction technologies, increased sophistication volume of building services, the greater reliance on IT technology, the adoption of new methods of construction delivery and the shift

towards project management. The emergence of subcontracting provided the means of achieving such specialisation of construction.

Another reason for the shift towards subcontracting is that subcontracting would have never gained popularity if it had not been seen by trades-persons as providing the opportunity to set up and run their own specialized businesses (Thomas & Phillip, 2009). Today, the diversity of subcontractors is considerable, ranging from the one person operation to large highly sophisticated corporations. Since general contractors prefer to operate in a low risk-immune environment of construction and project management, subcontracting firms have been given opportunity to pursue 'packaged contracts' which may go well beyond the boundaries of their traditional trade expertise.

Outsourcing (subcontracting) has increased over the last three decades. This has meant that value chains are restructuring considerably with main contractors concentrating on management and coordination functions of construction projects or servicing the projects. There has also been increase in the number of smaller companies that take on delimited and specialised parts of construction (David, 2003).

#### **2.1.4 CLASSIFICATION OF SUBCONTRACTORS**

A subcontractor is an organization in direct contract with the main contractor to perform a portion of the works as shown and described in the contract documents. The following are categories of subcontractors in the construction industry namely; domestic subcontractors, labour-only subcontractors and nominated subcontractors:

##### **i. Nominated Subcontractors**

Nominated subcontractors are selected and employed by the client or the Architect on behalf of the client to enter into contract with the main contractor to perform a specialists work in the project. In most cases, the form of contract signed between the client and the main contractor regulates the operations of the nominated subcontractor. The main contractor has to approve the nominated subcontractor (JBC, 1999). The main contractor is permitted to make a profit from the

use of nominated subcontractors on site, but must provide attendance (usually provision of water, power, etc. to enable the nominated subcontractor to do his job).

Nomination of subcontractors is used because there are benefits for the Employer in using the system. The key benefit for the Employer is control over the choice of, and performance required from a nominated subcontractor. Above all, the Employer reserves to itself the choice of subcontractor. The criteria for nomination of a subcontractor can be based on offer of the lowest bid or highest quality design input or some combination of price and quality benefits, proven track record for good work. In other cases, the Employer may have developed a long-term business relationship with subcontractor.

**ii. Domestic Subcontractors**

Domestic subcontractors are selected and employed by the main contractor to perform a portion of the main contractor's work under the main contract (JBC, 1999). Appointment of the subcontractor is treated as being something entirely for the benefit of the main contractor, a purely 'domestic matter'. A direct contract is formed between the sub-contractor and the main contractor. The Employer traditionally plays no part other than simply giving consent when that is required under the terms of the main contract. Although the main contractor delegates performance of a part of the works to his domestic subcontractors, he nonetheless remains fully responsible to the Employer with respect to the subcontracted works. The Employer in no way underwrites the risk of subcontractor default. He is also directly responsible to the domestic subcontractor for payment and for their fundamental operations.

**iii. Labour-Only Subcontractors**

Labour-only subcontractors are selected and employed by the main contractor to provide labour force for some particular sections of work such as tiling, concreting, masonry works, plastering, roofing (David, 2003).

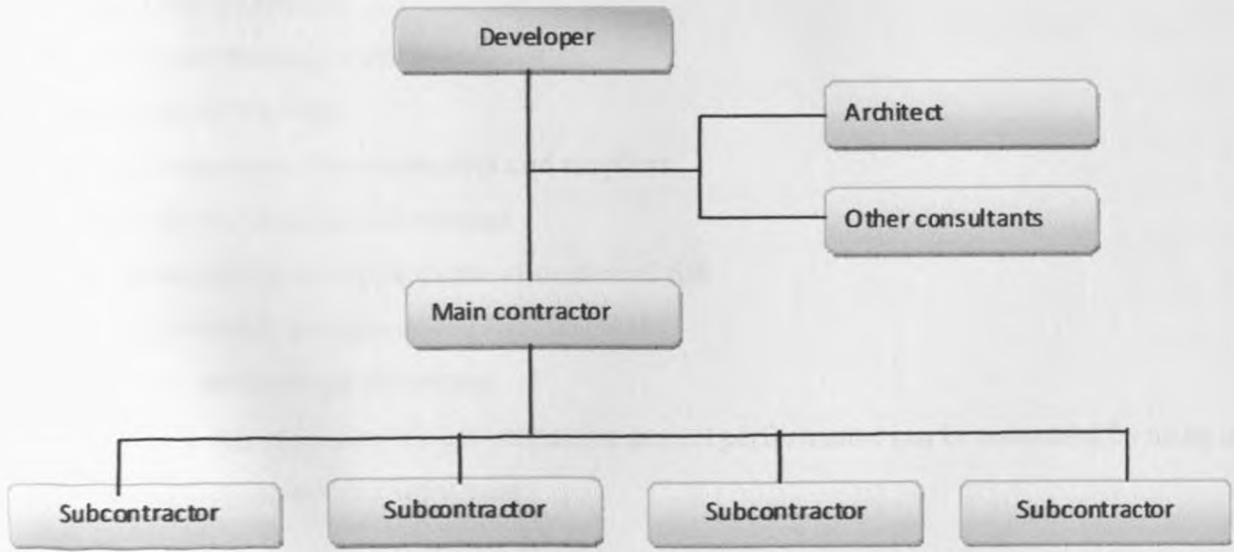
**iv. Approved Subcontractors**

Approved subcontractors are appointed through a concerted effort of the Client and the main contractor. The main contractor is given a list of names by the Client or the Architect, of subcontractors to whom he may get into contract with for the package of works within the main works. The main contractor chooses one of the sub-contractors given in the list and adopts him as his domestic sub-contractor. The test of whether a subcontractor is a domestic or nominated depends on the circumstances surrounding their appointment (Rylan, 2004). This distinction is always important as it assists in allocating the risk either to the main contractor or to the client.

The general guidelines considered are:

- *Did the main contractor have complete choice over which subcontractor to appoint?*
- *Was the main contractor asked to submit a list of subcontractors he would wish to engage if need arises?*

If the answer to any of the above questions would be 'yes', the subcontractor is domestic and the risk of performance shifts wholly to the main contractor (Rylan, 2004).



**Fig 2.1: Typical project organization structure in Kenyan construction industry**

Source: Rylan, 2004

## 2.20 CONSTRUCTION PROJECT PERFORMANCE

This sub-topic will give an overview of the issue of construction performance, how performance is determined (performance indicators) and measured. Performance is all about meeting the needs and expectations from a project. Construction project performance is defined as the eventual completion of a project within the originally set contract period and the originally set cost target. It has been pointed out that, in today's highly competitive and uncertain business environment, Clients want speedier delivery of their project with early start of construction work, certainty of performance in term of cost, quality and time, value for money for their investment, minimal exposure to risk and early confirmation of design and price or cost. Time and cost achieved at a project completion are the widely used measures of a project success (Mbatha 1986, Talukhaba, 1988). However, there are other indicators of project performance whose effects have been found to be insignificant by the above cited studies:

- a. Poor estimates by the Client/Consultant
- b. Inefficient technical/economic appraisal
- c. Lack of contract strategy
- d. Wrong type of contract
- e. Poor contract management/control
- f. Bad industrial relations
- g. Lack of competence by contractors and suppliers
- h. Badly written conditions of contract
- i. Poor assessment and inappropriate allocation of risk
- j. Inadequate tender evaluation
- k. Excessive variation and disruption

Mbatha (1986) argues that building construction project performance can be measured by using a number of indicators, some of which are:

- 1) Cost
- 2) Time
- 3) Productivity
- 4) Rate of Return
- 5) Value for money



6) Contractor's profit margin

7) Participant's satisfaction

Time and cost are the easiest to measure because empirical data can be obtained on the initial estimate and the final cost and time of the project. Mbatha (1986) argues that the rest were not easy to measure since the quality of management required is not specified to the contractors as Architects only specify materials and workmanship so as to ascertain the input/output relationship in terms of labour, materials plant, management level of a combination of part or all of these factors together. The performance of any project is also dictated by the contract signed between the client and the main contractor. It is therefore the provisions in the contract that are used to measure the performance.

### **2.30 PROCUREMENT OF SUBCONTRACTORS**

The use of various project procurement systems shows that the construction industry is trying to meet the clients' needs. This is because the different procurement methods will have different effect on the cost, time and quality of the project. Each project procurement system has its own peculiarity in term of the pre-tender and post tender activities and processes, division of risks between client and contractors, and the effectiveness of project monitoring and control. It is very important at the very outset of the project to carefully consider all factors when selecting the most appropriate procurement approach for a construction project. This is because each system has its own feature and peculiarity that will have effect on the cost, time and quality of the project i.e. the project performance.

The procurement of construction project is vast in scope because it involves the gathering and organizing of myriads of separate individuals, firms and companies to design, manage and build construction products such as houses, office buildings, shopping complex, roads, bridges etc. for specific clients or "customers". It also involves arranging and coordinating people to achieve prescribed goals or objectives. Masterman (1992) described project procurement as the organizational structure needed to design and build construction projects for a specific client. It is in a sense very true because the process of "obtaining" a building by a client involves a group

of people who are brought together and organized systematically in term of their roles, duties, responsibilities and interrelationship between them.

The main contractor takes prime responsibility for seeing that the project is executed and gets into agreement with the client to do so. The cost of the contract is mainly a fixed sum and may have been derived from a bid submitted by the contractor. In some cases, before offering the bid or before contract negotiations begin, the general contractor normally asks the subcontractors to estimate the price they will charge to do their part of the work. Thus, the general contractor will collect information from electricians, plumbers, dry wall installers, and a host of other subcontractors. Once construction begins, the general contractor coordinates the construction schedule, making sure the subcontractors are at the building site when needed so that the project remains on schedule. The sequencing of construction and the supervision of the work that the subcontractors perform are key roles for the general contractor.

Subcontractors sign contracts with the general contractor that typically incorporates the agreement between the general contractor and the owner. A subcontractor who fails to complete work on time or whose work is not acceptable under the general contract may be required to pay damages if the project is delayed because of these problems. The general contractor is under an obligation to pay the subcontractors any sums due them unless the contract states otherwise. Some contracts state that the subcontractors will not be paid until the general contractor is paid by the owner. If the owner refuses to pay the general contractor for work a subcontractor has performed, the subcontractor has the right to file a mechanic's lien against the property for the cost of the unpaid work (Hsieh, 1998).

When changes are made to the project during construction, subcontractors expect to be paid for the time and materials expended on the change. Subcontractors must receive formal approval to make the change and have a cost attached to the change before doing the work. Otherwise, when they submit a compensation request, it may be denied either because too much time has passed or because the general contractor or the owner believes the work performed was within the scope of the original project. The use of subcontract arrangements as part of the overall procurement strategy of the client is widespread within construction. Subcontracts in construction are often

implemented in the spirit of adversarial relations that have traditionally characterised procurement in the industry (Hsieh, 1998).

Changing and emerging procurement strategies in construction have changes that are bringing about a shift from the traditional subcontractor arrangement to one of co-contracting. This emerging form will feature prominently in the procurement process within construction. Developing appropriate strategies to address such procurement forms will be essential for the future viability of construction companies. For the distinction of different existing procurement systems, three basic characteristics are identified: Responsibility for design and construction of the facility, whether this should be given to separate organisations or to a single organisation; whether the contractor should construct the works or manage the construction process and the basis of remuneration of any work done.

Some of procurement systems in common use within the construction sector include:

- Traditional competitive tendering arrangement in which the principal contractor tenders for and constructs the work to a design that is previously prepared by the client's designers/consultants.
- Design and build procurement places responsibility for both (design as well as the construction) on the principal contractor, which also constructs the facility.
- Management contracting arrangement, the principal contractor is engaged in a management role for the construction process, while other contractors undertake the actual construction in a subcontract arrangement. Where such subcontract arrangements are held directly with the client, the procurement system is described as construction management (Edum-Fotwe & McCaffer, 1999).

The selection of procurement method should take into account the nature of the specialist work and the mutual impacts among the progress of the work and other works. For highly specialized works that few companies, or just one single company, can undertake, advanced selection and engagement of the prospective contractor(s) during the design stage will help the client obtain a realistic picture about the functions, features and performance of the systems that he may expect.

An important aspect therefore is that it is very difficult for most subcontractors to start working with a client/developer, if no previous contacts have taken place between them. Therefore these subcontractors have a limited market with difficulties to expand. One way out of this situation is applying new marketing tools, also on the Internet. It is not that easy to find new clients, as in most cases they work with the same contractors. Further, clients are under pressure to find ways to cut costs but purchase, at the same time, good quality products. Also, the construction sector is moving from a very traditional sector, with the main objective to minimise construction costs, towards a demand driven sector. As a result of this, other factors (quality of products, logistics, user requirements, etc.) are playing an important role. Therefore, in procurement processes (which are increasingly e-procurement processes) the focus will be on selecting the most appropriate subcontractors for an investor or a principal contractor.

### **2.3.1 SELECTION OF SUBCONTRACTORS**

Selecting appropriate subcontractors is a key to assure the success of a construction project.

According to the Latham Report (1994) the separation of the design and construction processes, selection of contractors on the sole criterion of price and the subsequent lack of cooperation between those involved in the development process have been cited as being at the very core of the industry's problems.

As noted earlier the construction industry is growing rapidly and therefore subcontracting is a normal style in Kenya's construction industry. Selecting the appropriate subcontractor is paramount in ensuring a successful construction project. With different environments, a construction process usually invokes complex attributes which make it essential to evaluate every stage of the building procurement (Yan et. al., 1998). The quality of work can suffer where incapable or inexperienced subcontractors are employed. Additional problems also exist in the form of bid shopping, unclear accountability and high fragmentation (Palaneeswaran et al., 2002)

The general dissatisfaction with the current practice in subcontracting has motivated the introduction of various measures aimed at enhancing the subcontractor performance (Hsieh, 1998). In the U.S, to prevent the main contractor from bid-shopping, the US listing laws require a mandatory disclosure of subcontracting firms at the time of bidding. In addition, for instance in

Hong Kong, some clients impose restrictions on the percentage of work to be sublet. Such constraints are normally imposed where the work is significantly important or where testing, supervisory or performance control is considered to be difficult (Thomas et al., 2003). An extensive web-based research conducted by Thomas et al., (2003) was done on procedures and practical guidelines concerning subcontractor selection in the US, Singapore and UK. Based on the collected information, criteria for scrutinising subcontractors was then compiled which includes:

- i. Financial aspects – Timely payment to labourers, financial strength to sustain the required cashflow
- ii. Experience - Number of relevant projects completed, number of years in business.
- iii. Resources – adequacy of experiences site supervisory staff, sufficiency of craftsmen and labourers, plant, materials, and existence of proper organizational structure
- iv. Quality of work – standards of workmanship, standard of preparation works, standard of equipment/materials supplied
- v. Progress – availability of appropriate programme of project start, adherence to programme, updating programme as works progress
- vi. Design quality – adequacy of design professional and experts, quality and presentation of design, quality of shop and as-built drawings
- vii. Site safety – Inspection and maintenance of plant, provision of safety information, instruction and training, inspection and maintenance of work environment
- viii. General obligations – coordination of utilities and other subcontractors, care to public utilities, care to works by others, compliance with conditions imposed by other parties, sufficient notice for inspection of works.

The main pre-requisite for a compact and efficient subcontracting system is the existence of an extensive supply of well performing and competitive subcontractors (Berry, 1997).

### **2.3.2 PROBLEMS ENCOUNTERED IN SUBCONTRACTOR SELECTION**

The selection of subcontractors in the building industry often encounters various problems all that vary with the various organization systems employed by the various contractors (Kigo, 2007). Subcontracting has been identified as a major cause of substandard performance (Love et

al, 1998). Damage by subcontractors and poor workmanship has also been identified as a major cause of defects at practical completion (David et al, 2000). The problems encountered include selection of inappropriate subcontractors, difficulties in the management of the subcontractors and out of control budget and control systems (Yan et al., 1998). Such problems might be caused by insufficient time for selection, complicated procedures or poor information subsystems between the main contractors and consultants in case of nominated subcontractors.

Uncertainties in relation with nominated subcontractor's technical qualification, timeliness, reliability and financial stability may bring performance problems in terms of budget, project schedule and quality. Patrick et al, (2002), notes that the construction industry is dominated by a large number of subcontractors and relatively a few main contractors in the upstream. This proposition implies that the non-performance or poor performance by the subcontractors puts the whole construction industry in jeopardy. The selection of subcontractors therefore becomes very crucial. The selection process should be controlled and done in a fair and objective manner to enable a successful project performance and ensure that the main contractor remains competitive. The other problem would include the architect nominating only subcontractors he knows and therefore not getting the best bargain for the client, tendering information only reaching a few subcontractors who can easily collude (Yan Chyuan et al., 1998).

The problems discussed above have prompted the players in the construction industry including the client organizations to attempt to come up with a better method of procuring the services of specialist subcontractors. In the developed countries mostly the United Kingdom and Japan, a system known as Analytical Hierachy Process (AHP) has been used. AHP is a decision analysis approach developed by Salty, 1971. The system has been customized to be able to analyse the various factors to be considered for subcontractor selection. AHP selection system has started gaining popularity especially in the area of subcontractor selection which is perceived to be very uncertain (Yan Chyuan et al., 1998). The system takes into consideration many factors when conducting the selection process. Firstly is the subcontractor evaluation. The evaluation begins with defining the evaluation criteria based on quality of work, progress control, materials management, safety management, cooperativeness and allocating weights.

The second step involves maintain subcontractor's information profiles and data guarantors. The data includes name, address, contacts, technical performance and administrative profiles of the subcontractors. The data is also often updated to keep track of the subcontractor's existence. The other factor put into consideration is the subcontractor module. AHP method is suitable for complex technological, economical and social political decision. The method has not been tried in Kenyan construction industry. However, with the current trends of globalization and development in information and communication technology added to the complexity of technology, economic factors and the increasing need by the client for value for his money, the AHP method might soon be applied.

Price is usually a key factor of selection in the traditional system and especially in most public projects. However, this traditional price oriented selection approach emphasizes price and neglects the quality, time frame and other factors of prime importance in the procurement of subcontractors. This may lead to awarding a price that is far much below the bid price, bringing a higher risk of project failure. Project planning is essential in the building process as many activities are linked. Accordingly, in most cases, one subcontractor can only start when another has finished his job. As it is not always possible to stick to the original time planning (e.g. because of bad weather) the project planning has to be continually adjusted, which may have an impact on the planning of other contract work

### **2.3.3 SUBCONTRACTOR SELECTION METHODS**

A good selection system should take into consideration technical ability, reputation, financial stability, experience on similar work and reasonable price. The main methods used for subcontractor's selection include selective tendering, open tendering and direct negotiation (Ngari, 1990).

#### **a. Open Competitive tendering**

This method is applicable mostly to nominated subcontractors. Under this method an advertisement is placed in local, national and technical press by the client's professional advisers inviting interested subcontractors to submit tenders for the subcontract work. The advertisement

comprises of a brief of the work to be subcontracted, the project schedule, the client and other crucial factors. The method is mainly used and is suited to public bodies, local authorities and parastatal organizations where accountability and transparency is most required. The advantage with this method is that it involves many bidding subcontractors and the associated benefits of competition and provides opportunity to get the most suitable contractor though this is not assured.

A risk element with this method of selection is that the client cannot ensure before the bidding that the prospective subcontractor has the required experience, sound current trading position and sound financial status. Open tendering also involves high administration costs and time commitment. This has made the method not popular with private clients where time and cost is of critical importance to them. This method of nominated subcontractor selection has led to selection of incompetent subcontractors, excessive claims by subcontractors against main contractors, disputes and excessive litigation (Clough, 1994). The selection is based on technical capability, administration ability to handle a certain project, past performance and lowest price. In most public projects as already seen the lowest price is given a relatively higher weight than the other factors (Franks, 1998).

**b. Open Selective tendering**

This is a method of selection where a number of subcontractors are selected or invited to tender. This method is an attempt to cover the shortcomings of open tendering process of nominated subcontractor selection.

The normal practice is to have the client or the Architect on behalf of the client, advertise in the local dailies giving conditions that the subcontractors must meet. Prequalification of the subcontractors is based on past performance, technical knowledge, administrative structure, qualification of key personnel, financial status, compliance with legal or statutory requirements, current trading position, guarantors and referees. After prequalification, the Client or Architect then invites the selected subcontractors who can bid for the works.



In some cases, the main contractor develops and maintains a list of preferred subcontractors from which the Client or the Architect may nominate from. This method is highly associated with past relationship between the nominating parties. The advantages associated with selective subcontractor selection method include the submission of quotations by only prequalified subcontractors thus reducing cases of poor performance or non-performance and the reduction in cost and time in obtaining quotations.

The major disadvantages experienced in this method include the submission of higher quotations due to the knowledge of the subcontractors of the nature of obtaining the quotations or collusion by the bidders and the erosion of the level of competition and associated benefits. This method is employed to a greater extent than the open tendering system of subcontractor selection.

**c. Single Sourcing/Direct Negotiation**

The client or main contractor approaches the subcontractor, one or two of his choice with a view to this being the only firms who will submit a tender. This method is highly preferred where a quick start is required or the subcontractor has a specialist technique required for the works and when the industry is stressed with work and it would be hard to obtain a reasonable quotation (Richard et al, 1982).

Another reason for direct negotiations is where a client or architect or the main contractor has had a good working relationship with the subcontractor. Some main contractors propose that direct negotiation is the best method of subcontractor selection since it ensures commitment and trust (Akinici, 2000). Other contends that this method can be used to develop and sustain long term relationships which are desirable in the construction industry (Patrick et al, 2000). The criteria used for the selection is based on business relationship (past performance given the highest ranking, technical ability, reputation, financial stability, experience on similar work and lowest price in that order (Yan-Chyuan, et al. 1998).

Negotiated subcontracts are commonly used in private works as for most public projects, competition is a legal requirement except under unusual circumstances or on emergency cases.

The main advantage with this selection system is that a main contractor or client is able to retain the services of a good subcontractor; the system may produce a lower figure than normal due to negotiation and the reduction of the cost involved in procuring the services of the subcontractor.

However, the method also has disadvantages, the main one being that it's a lengthy process. It takes a long time in negotiating with the subcontractor and the long term higher costs as the Architect or main contractor has to negotiate every item of the subcontracted work with the subcontractor. Generally, there is no subcontractor selection method without pitfalls. The selecting parties should aim at optimizing the selection process to obtain the most effective and efficient subcontractor at the lowest procurement costs and within a reasonable duration of time.

## **2.40 REASONS FOR SUBCONTRACTING**

Subcontracting has been a long-standing practice in the construction industry. Literature on subcontracting identifies a number of different reasons why construction firms (independent of size) decide to subcontract part of their production. These reasons may include lack of in-house capacity, need for accessing external expertise/technology, financial reasons (e.g. cost-cutting strategies) or other reasons (e.g. access to geographical areas with growth prospects).

The widespread use of subcontract arrangements in construction follows from the nature and structure of the construction industry. As the industry's workload is highly diversified by type, size, function, form, and method of production, and materials used, the execution of the works equally requires services of many different trades and specialists. Companies of a relatively smaller size carry out activities that are not undertaken by the contractor as well as those of a specialist nature, through a subcontract arrangement. The use of such subcontract arrangements enable larger construction companies to maintain greater flexibility and to cope with the high variations in orders often associated with the industry. As a result, the construction industry is dominated by a large number of small companies that provide subcontracting services to their larger counterparts (Edum-Fotwe & McCaffer, 1999).

Extensive use of subcontractors is reported in many countries, including the UK (Gray and Flanagan, 1989) and Japan (Bennett et al, 1987). Kenyan construction industry is no exception.

With unpredictable workloads and a need for a multitude of specialized skills, subcontracting has become a norm with many main contractors in order to reduce their risks (Bresnen et al., 1985, Beardsworth, 1988). Bresnen et al. (1985) state that one of the major reasons for contractors to use subcontractors is that the industry is: *...cyclical, site relationships are temporary and specialist trades are not required full-time*. Subcontracting has been strategically used in the construction industry to allow firms to employ a minimum work force under fluctuating demand.

Dividing a construction project into works of specialist trades and subcontracting the works to a number of specialist subcontractors allows each trade of work to be undertaken by a subcontractor who has comparative advantage in the specific trade, thus allowing the project to be accomplished in the most economical manner. The specialist subcontractors gain their comparative advantage by virtue of their specialist knowledge and skills in the trade, which may include technical know-how and their ability to efficiently organize resources input for the works, such as sourcing for appropriate workers, equipment and materials at the right time and at the right prices. Subcontracting is perceived as an efficient method and has become a conventional practice for procurement of a range of specialist works in buildings, such as heating, ventilating and air-conditioning (HVAC), electrical, fire services and lift and escalator installations. Ritcher & Mitchell (1982) argued that main contractors can obtain a higher profit margin by reducing their performance costs by subcontracting work to those who have the necessary resources to perform the work more efficiently and economically.

In some case, main contractors may resort to subcontracting in order to use specific subcontractor's equipment and skills to produce either finished products or specialised components requiring a high level of technical expertise that the main contractor does not possess or cannot meet (Berry, 1997). Generally, small and medium-sized construction firms can benefit from their involvement as subcontractors in different ways: more business opportunities, indirect access to larger markets, and access to external knowledge and technology transfer coming from main contractors, better use of the installed capacity and financial benefits.

Woon & Ofori (2000) suggested that subcontractors are needed due to the following reasons:

- Different projects have different features and requirements and as a result, it would be uneconomical for the main contractor to keep all the required specialized skilled workers and equipment; and
- There is a lack of continuity in work due to fluctuating demands in the construction market. In response to the uncertainty of workload, main contractors do not want to employ workers directly in order to reduce overheads. If the main contractor is established, he may retain a group of general workers, unskilled or semi-skilled, to assist the subcontractors as well as to carry out the minor operations on site. The main contractor would normally also provide the necessary tools, plant and any temporary supports for the subcontracted works

International subcontracting can be used as a mechanism for firms (especially large ones and multinationals) to have access to geographical areas with potential growth prospects. In this way, they establish a link with a particular location and penetrate new markets.

Beardsworth (1988) pointed out that subcontracting could be seen as an organizational alternative for some economic activities. Firms are decentralizing their jobs more and more, allowing subcontracting to become a basic part of the work organization. The subcontractor's typical source of work is the general contractors that assume responsibility for complete construction of the project. At any point of time, the subcontractor is providing specialty construction services to a number of general contractors with varying expertise in subcontract development, subcontractor management and relations; project management, coordination, and control; and project cash-flow reliability. Decisions on individual projects are often influenced by the objective of sustaining an on-going relationship. Both the short-term (project) and long-term relationship with the general contractors are essential to the success of all specialist contractors.

#### **2.4.1 ADVANTAGES OF SUBCONTRACTING TO MAIN CONTRACTORS**

The principle advantage of subcontracting is improved efficiency. With increased efficiency projects are expected to be completed within the scheduled time. This can be realized in that subcontracting leads to higher level of specialization of trades and improved way of executing

the tasks, there is generally an improved site-productivity. Main contractors also benefit from competitive subcontract bid prices, which improve competitiveness of the general contractor's tender, which in turn results in relatively lower total project cost.

Subcontracting reduces the overhead costs for a main contractor as a result of a smaller, directly employed labour force. Engaging subcontractors allow main contractors to conserve capital by relieving them of the investment and financial burdens since subcontracting allows for funding of the project by the subcontractors thus improved cashflow for the main contractors. Subcontracting is a strategy for risk allocation by main contractors. The subcontracting system enables the main contractor to shift over much of the contract risks to the subcontractors. Through subcontracting, time reduction in a project may be achieved since work on more than one phase of the project can be done at once, often leading to a quicker completion.

#### **2.4.2 ADVANTAGES OF SUBCONTRACTING TO SUBCONTRACTORS**

Literature identifies a number of inter-related opportunities that have opened up for subcontractors. Subcontracting can expand business opportunities due to the intermediation function assured by the contractor and to the positive effects (in terms of reputation and prestige) that are derived from working with established firms, which can foster subcontractors' indirect access to new business opportunities (Frank, 1998).

Subcontracting activities may facilitate higher levels of efficiency (and subsequently higher levels of productivity) and better use of specific skills by subcontractors, due to higher specialisation in the completion of certain activities, components or parts. This specialization also creates economies of scale resulting in improved cost advantages for the subcontractors (UNIDO, 2003). The subcontract arrangements further, enable subcontractors to increase the rate of utilisation of the installed capacity, reducing therefore spare capacity and under-utilisation of existing facilities and increasing output and revenue (Nooteboom, 2003).

Involvement in subcontracting activities can be a vital source of knowledge and technology transfer for subcontractors (Deardorff & Djankov, 2000). In addition, sometimes contractors

provide financial support to their subcontractors for instance through advance payments (Frank, 1998) hence financial benefits for subcontractors.

## 2.50 CONTRACTS

The size, nature, location and complexity of major construction projects results in a complex chain of contractual relationships. Management of a construction project is delegated to a head contractor. Specialist work is then let to subcontractors. However, due to issues such as scale and complexity, a significant number of major construction projects have additional layers of contractual relationships. Typically the head contractor divides a construction project into packages of work. These packages are let to major subcontractors, who then in turn subcontract specialist work within each of the packages. Major construction projects involve a complex sequence of interdependent tasks that require different types of specialist workers. The level and types of specialist skills used vary over the life of the project.

The major types of building and construction contracts can be differentiated by:

- o management structure;
- o liability and risk sharing;
- o design management;
- o tendering procedures; and
- o determination of contract price.

A Subcontract Agreement is a very useful legal document that allows one contractor (the “Contractor”) to hire another contractor (the “Subcontractor”) to undertake a portion of work for the main Contractor. This agreement is usually used when the Contractor has already entered into an agreement with another party to perform specific work.

This is a very common type of arrangement and it is absolutely necessary for both parties to have a written contract which outlines the scope of work, fees and payment, and provisions in the event of non-payment or incomplete or substandard work.

### 2.5.1 SUBCONTRACT

A subcontract is the main legal vehicle of the relationship between a main contractor and a subcontractor. The conditions of subcontract allocate risks and define the rights and obligations of the parties under the subcontract. A study conducted in Australia, revealed that subcontractors view the conditions of subcontract as the source of the greatest risk particularly those prepared by the general contractor. Therefore, the knowledge, interpretation and administration of such conditions is a fundamental requirement of good contract management.

Some general contractors prefer to use mainly their own conditions of subcontract tailored to their specific needs. The in-house drafted conditions of subcontract often contain terms and conditions unfavourable to subcontractors. The basic problem with in-house drafted conditions of subcontract is that they rarely treat both contractual parties as being equal, with inequity borne mainly by subcontractors. Terms of payment, contractor's program, arbitration, withholding payment, retention, variations, delay, site facilities, and acceptance of responsibility are a few typical areas where unfair and onerous conditions have been applied (Peacocke, 1978).

Negotiating a construction subcontract can be a frustrating endeavor, but it is an important one. Subcontractors usually have an arduous task negotiating fair conditions, and even harder task in getting them applied. Many construction disputes are lost in court because a subcontractor signed an onerous subcontract without thought. Subcontractors often adopt a "everybody else is doing it mentality" about agreeing to unfair subcontract terms. A subcontractor should determine the risk tolerance as an organization and negotiate subcontracts accordingly.

Peacocke (1978) suggests that subcontract conditions should be framed in such a way that:

- i. They are equitable to both parties, with neither in a preferred position with regard to the other especially in risk allocation.
- ii. The rights and obligation of the parties and on the work to be done should be clearly described.
- iii. In the event of non-performance of one party or the other party, the injured party may claim adequate remedies

iv. A satisfactory procedure of settling disputes forms an integral part of the conditions including an arbitration clause.

The presence of onerous condition in a subcontract can be a critical risk as it can cause an adverse impact on the subcontractor's profitability. Among the most risky conditions are terms of payment, extension of time, price fluctuations, liquidity damages, delay and cost of delays (Thomas et. al, 2009). Some subcontractors respond to onerous conditions of subcontract by including an appropriate risk allowance in a bid price.

In many cases, although informal letters of proposal and acceptance may suffice for subcontracted work, it's highly recommended to formalize subcontracts into a written document that sets in detail the rights and responsibilities of each party to the subcontract. A subcontract document should be prepared with great care as it defines the obligations of the contract parties in the transaction and, in case of dispute, is the key reference for judging which party has breached his obligations and thus should be held liable to damages inflicted upon the other party. In the subcontract document, especially in the specification, all the key deliverables should be clearly and precisely defined. The main contractor may use a standard subcontract form or may develop his own special form to suit its particular requirements. Subcontracts are similar in content and form to the main contract.

Risk allocation strategy in construction projects is defined through the contractual arrangements. The days of handshakes to seal a deal in the construction industry are long gone. These days, it's important that contracts between contractors and subcontractors are carefully constructed, executed and followed throughout the duration of the project. When delegating work to a subcontracting company, one must evaluate scope, cost and conditions when drafting the contract. Both parties should be sure they are satisfied with the terms before the contract is signed. On some projects, the owner reserves the right to approve which form of subcontract form to be used by the main contractor.



### 2.5.2 SUBCONTRACT MANAGEMENT

The widespread use of subcontract arrangements in construction is a result of the nature and structure of the construction industry. The use of subcontract arrangements enable the larger construction companies to maintain greater flexibility and to cope with the high variations in orders often associated with the industry (Hillebrandt & Cannon, 1990). Increasingly, specialist works are procured through subcontracts to enhance performance of buildings, but realizing this objective cost effectively requires efficient organization and management of the subcontract works. Decision on the contract arrangement to be used to procure specialist works should take into account the contract sums, the contractual liabilities that the contractors should shoulder and the ability of the contractors to bear the liabilities. The contract document should clearly define the scope of work, contain no ambiguous terms and conditions, and include specifications on interim and pre-handover performance measurement and verification methods and criteria.

Thoburn & Takashima (1992) provide evidence of a growth in the use subcontract arrangements by UK firms in their attempt to develop greater flexibility to both competition and other market conditions. As a result, the construction industry is dominated by a large number of small companies that provide subcontract services to their larger counterparts (Hillebrandt & Cannon, 1990). Subcontract arrangements within construction are employed in all the different procurement strategies in use.

Subcontractors comprise a very diverse group of enterprises: different role and position in the production chain, different levels of power asymmetry vis-à-vis their contractors, different operational capabilities and financial resources or the sector of activity (OECD, 2007). Some subcontractors keep lasting contacts with contractors and develop technical or even financial co-operation, whereas other subcontractors face hard competition and are engaged in arms-length relationships with contractors.

Though general contractors increasingly recognize the need to manage subcontractor-related risk, most are not well equipped to do so. Very few have optimized their business processes that touch subcontractors. The following are four major obstacles that typically stand in the way of cost effectively managing subcontractor-related risk, namely:

- a) *Information silos* - Subcontractor data is scattered throughout the organization in information silos based on business function or department. This gives general contractors a highly fragmented and incomplete view of their subcontractors.
- b) *Business processes do not reflect best practices* - Processes have not been designed with risk management in mind. For example, subcontractor performance data is not effectively communicated from the job site to a general contractor's in-house estimating staff and management. As a result, poor performing subcontractors remain on bid lists.
- c) *Lack of business intelligence* - General contractors lack the means to provide employees with real-time and historical subcontractor data. Estimators do not have adequate information to select subcontractors effectively, and construction personnel do not have the tools to optimize subcontractor performance. Mistakes are repeated and opportunities lost as general contractors do not maintain a "corporate memory" of past interactions with subcontractors.
- 4) *Inadequate means of communicating with subcontractors* – For example, general contractors are largely reliant on oral communications and minimal written formal communication.

### **Critical Provisions in a Subcontract Agreement**

The following are some of the most critical provisions in a construct subcontract and which are frequently subject of litigation:

#### **a. Payment Provisions**

In practice, payment disputes constitute a large percentage of all construction disputes. There are two basic payment provisions in virtually every subcontract. First is the progress payment whereby the contractor generally makes payment based upon percentage of completion. Second is the final payment whereby the contractor generally makes payment upon completion and acceptance of the work. For contractor's, progress payments are leverage to keep the project current, leverage to correct deficiencies and leverage to perform extras, etc. Contractors typically withhold payment for one of three reasons: they claim the subcontractor's performance is deficient in some manner; they have no money (in which case the subcontractor is in a very tough position); and the Contractor has not been paid by the Client.

Some of the negotiating tips for subcontractors in a contract include:

- Attempt to negotiate less days payment terms e.g 30days.
- Set a time limit for receipt of payment from the Client.
- If the Contractor requires a 'pay if paid' clause, or If the Contractor is demanding an enforceable conditional payment provision then seek to retain an express right to stop work.
- Rely upon standard industry forms for payment terms. For example, the JBC contract document provides a "pay if paid" clause for the final payment only.

Often times, and in most subcontract forms (JBC, AIA, AGC, etc.) final payment, including retention, is conditioned upon the occurrence of numerous items such as receipt of close out documents, receipt of written warranties, payment from the client, acceptance of the work by the client/architect and final or substantial completion of the entire project. In addition to the tips below, all of the comments for progress payments apply here as well. The contract negotiating tips for subcontractors would include those for progress payments and more so negotiate that final payment is due upon substantial completion. Also, ensure that "acceptance by client/architect" provides that they (client/architect) will not unreasonably withhold approval, for instance through "over inspection".

#### **b. Warrant**

Warranties can arise by agreement or by legal implication. Warranties pose a significant risk in forms of term and notice provisions. These risks can be minimized through clearly defining the term of the warranty, defining how notice is to be received, and through the use of disclaimers. Some of the negotiating tips for subcontractors are being certain to define when the term begins mainly at the date of substantial completion and define the date precisely.

#### **c. Scope of work**

Scope of work is a vitally important section of any subcontract. A great deal of time and effort should go into scrutinizing the scope of work so that all questions and omissions can be discussed prior to commencement. The contract negotiation tips include: One of the most dangerous scope of work provisions is that which generally states "To the extent any item or

work is omitted from the drawings or specifications, the need for which can be reasonably inferred therefrom, are hereby included as Subcontractor's Work under this Subcontract." The word "reasonable" invites a dispute. If possible, it is advisable to agree that work will be performed pursuant to the contract documents. To the extent changes are necessary, the parties should follow the change order or work change directive procedures provided for in the contract documents. Drawings and specifications should be referenced as specifically as possible.

#### **d. Delays and time extensions**

Virtually every project experiences some event that delays completion. Thus, provisions relating to delay damages and time extensions are extremely important. During contract negotiation determine whether the subcontractor is entitled to an extension of time if delay is caused by contractor or anyone for whom contractor is responsible. To the extent delay is caused by client or client's representative, require that contractor seek an equitable extension of time pursuant to the main contract. If contractor fails to seek such extension, or fails to comply with the main contract relating to extensions of time, then Subcontractor shall have the right to an extension of time without regard to whether Contractor receives a similar extension from the Client.

#### **e. No Damages for delay clauses.**

"No damage for delay" clauses are often used by contractors to avoid liability for delays caused by anyone. These clauses typically provide that in the event of a delay which the subcontractor did not cause, the Subcontractor's sole remedy shall be an extension of time and subcontractor shall have no right to any additional compensation except to the extent the contractor recovers the same from the client. This clause makes the subcontractor assume the risk of client breach, contractor breach and other Subcontractor's breach and is fundamentally unfair. Therefore, in the contract negotiation, a subcontractor should ensure at a minimum, eliminate no damages for delay where the delay is occasioned by the act, omission, or breach of the contract. If the contractor fails to perform, it must pay for damages caused thereby. Further, if possible, eliminate no damages for delay where the delay is caused by other subcontractors. Here, such delays are out of your control and the Contractor has recourse against the party at fault to recover any damages you suffer.

#### **f. Indemnification**

It seems the modern contractor requires subcontractors to indemnify them, and everybody else who they have a relationship with. Indemnity provisions should cover personal injury and property damage claims resulting from the construction work, but only to the extent caused by the subcontractor. However, most indemnity obligations span well beyond personal injury and property damage caused by the subcontractor unfairly shifting the risk of the project to the subcontractor. As a contract negotiation tips a subcontractor should seek to amend the indemnity provision to provide that “subcontractor hereby agrees to indemnify and hold harmless, contractor, client and architect, from and against any claim, damage, expense, fee, fine, penalty, damage or any other cost arising out of or is related to subcontractor’s work and caused by subcontractor, subcontractors employees, agents, or others for whom subcontractor is responsible. To the extent any cause, claim, damage, expense, fee, fine, penalty, damage or any other cost arises or caused in part by contractor, client, architect or others, and in part by subcontractor, liability therefore shall rest solely on the party causing the same in proportion to its degree of fault or negligence.”

#### **g. Procedural Provisions**

Many subcontracts contain various types of notice and claims provisions. The most important of these procedural provisions are those requiring the subcontractor to give the contractor notice of some event. It is good for the subcontractor to make certain that all notice provisions are triggered by subcontractor’s actual knowledge.

#### **h. Termination**

The termination clause of a subcontract can be critical. The key issue for subcontractors in termination clauses is payment for work performed and costs of demobilization. most termination clauses give the contractor the flexibility to terminate the subcontract immediately and for its convenience, limiting the damages payable to the subcontractor in those circumstances. Generally, a contractor can terminate “for cause” where the subcontractor fails in some respect to perform its Work in accordance with the subcontract. Where termination is “for cause” amounts due subcontractor are offset by the cost of hiring a follow-on subcontractor to

complete the work. In these circumstances, it is important that the subcontractor have written notice of default and a meaningful opportunity to cure.

#### **i. Changes in the Work**

Changes in work arise in two basic ways: design changes and unforeseen conditions. The key is to define a “change” as any work outside the defined scope of work of the subcontract. Changes should relate to work that was not contemplated by the subcontractor. Subcontractors should beware of mark up limitations and other limitations on amounts to be paid for change order work.

Using nominated subcontracts allows clients to retain control over selection of subcontractors, determination of subcontract sums and timing of appointing subcontractors (could be before or after the award of the main contract). To main contractors, they are vested with the power to control subcontractors, including nominated subcontractors, on work progress and payment to ensure smooth project progress. They, however, are not normally liable to the designs of nominated specialist subcontractors and are entitled for extension of time due to delays in nominated subcontract works.

Subcontractors typically prefer nominated subcontracts for the more direct business relations with project clients and consultants, and the more equitable contract terms compared to domestic subcontracts, especially in security of payment. A further benefit to nominated subcontractors is that in the case of insolvency of the main contractor, the client may make direct payments to subcontractors in order to safeguard work progress.

Procuring specialist works through nominated subcontracts may also be problematic. The reasons for the decline in using nominated subcontracts in the UK included: the complex matrix of contracts being prone to disputes and adding complications to litigations; no incentive to main contractors to control expenditure; greater difficulty for main contractors to control specialist subcontractors; desire of the main contractors to have tighter financial control over the specialist subcontractors; and problems with liability of design, coordination and performance of specialist

subcontractors' works. As a means to recover any losses incurred by subcontractor's non-performance, a client may require the nominated subcontractor to provide a performance bond or a collateral warranty. Quite often, rather than being a choice of the main contractor to employ his own domestic subcontractors, the subcontracting arrangement is imposed by the client, in which case the subcontractors are nominated to the main contractor.

Efficient subcontractor management has always been vital to the success of construction projects, but its importance has increased significantly. In particular, changes to the construction industry's financial and risk management environment over the past few years have resulted in growing pressure on profit margins and given new urgency to screening subcontractor financial health and performance attributes.

## **2.60 RELATIONSHIP BETWEEN MAIN CONTRACTORS AND SUBCONTRACTORS**

The lack of trust between contractor and subcontractor on the adversarial nature of their working relationships has been characterized as a fundamental barrier to the increased understanding of each others' needs and further supply chain integration. Permeability, performances, satisfaction, business competency and equitable contract terms enhance trust building, where as bad experiences during interaction, negotiation approach towards conflict and unsatisfactory dispute resolution techniques deteriorate mutual trust between contractor and subcontractors.

Permeability is positively influenced by effective information flow, frequent communication and openness of the contractual parties. Situation ineffective, inaccurate and unorganized information generate work uncertainty, increase rework amount as well as project risk. In addition, changes in project scope also accelerate uncertainty and enhance subcontractor's claims regarding extension of time and extra/advance payment. Conversely, claim and risk make conflicts among parties which disrupt trust level. Performance level of subcontractor is directly measured by productivity which is extremely affected by work competency, joint approach of problem solving and adaptability of the subcontractor. Moreover, commitment towards completion of the project and on time resource availability enhances the productivity level positively.

Satisfaction levels of subcontractor are comprised of complete and effective information and drawings from contractor, win-win negotiation and getting prompt payment from contractor. Problem solving or compromising attitude towards negotiation bring its efficiency. However, forcing attitude of contractor generate adversarial relationship as well as develop conflict between the parties.

Conversely, a forcing attitude toward subcontractors at negotiation and unfair dealing, especially when paying subcontractors, has been identified as being ways of destroying main contractor-subcontractor trust level as well as relationships. Moreover, incomplete drawings, frequent changes of design, lack of frequent communication and transparency in relationship have been identified other major attributes in diminishing trust between contractor and subcontractor. The contractor should change their contracting process by shifting from "Price Only" single criterion to multiple performance criteria. This criterion facilitates a competitive contracting process, which requires projects to be awarded to the contractor offering the best combination of price and qualifications, instead of just the lowest bid. Conversely, it is also concluded that subcontractor should give considerations in selection of main contractor based on the reputation as well as business competency of the contractor company.

One of the key issues identified by Latham report (1994) was the need for greater efficiency. In this sense, it was argued that the main contractors and subcontractors could collaborate to reduce construction waste generation within the construction process to achieve higher efficiency and cut costs. There exists a mutual relationship between the subcontractors and the main contractors. The quality of work the subcontractors deliver affects the performance of the main contractors. Normally, the working relationship between the main contractor and the subcontractors extends beyond one project. It is due to mutual trust and past working experiences between both parties that the cooperation continues (Lim, 2003a).

In Japan, the relationship between the subcontractor and the main contractor is unique (Bennett et al, 1987). The main contractor depends on the subcontractors to execute his work. The main contractor is obligated to improve the capabilities of his subcontractors by extending benefits



such as financial assistance, provision of training, technical and management guidance, and guarantee of the subcontractors' profit level (Bennett, 1991). Such features are not found in Kenya. Firstly, it is not common for a subcontractor to remain exclusively at the service of one main contractor. Secondly, the main contractors in Kenya tend to address their own interests first. Since it is of the lowest priority, the main contractor neglects the welfare of the subcontractors (Bennett, 1991) and this affects their performance, which, in turn, affects the industry (Debrah & Ofori, 1997). The main contractor-subcontractor relationship has been a focus of interest in the literature (Kale & Arditi, 2001), yet its impact remains a virtually unexplored area in the construction management literature.

## **2.70 CONTRACTUAL AND OPERATIONAL CHALLENGES**

Sub-contracting becomes particularly uneconomic and inefficient when the sub-contractors themselves sub-let the work, sometimes through several tiers of sub-sub-contractors each with their own separate markups. In such cases, labour becomes so divorced from management that progress and quality suffer to the detriment of both the employer and main contractor. This is a serious problem in most subcontracting systems. Sub-contractors' performance in relation to progress, quality and timely completion is due to lack of management on the part of sub-contractors and inadequate planning, coordination by main contractors and poor contract administration (Kale & Arditi, 2001). As a result:

- sub-contractors attempt to follow programmes which do not work.
- sub-contractors prevent one another from working efficiently on site because the sequencing and timing of their various work activities have not been properly coordinated.
- sub-contractors' interim payments are under-valued.
- variations are not paid for until long after additional work is carried out.
- extensions of time are not granted and as a result liquidated damages are improperly set off against payment certificates.

Subcontractors have to face a number of challenges in order to benefit fully from subcontracting activities and remain competitive in the market. These challenges, most of them interlinked, can be summarised as follows (OECD, 2007):

*Subcontractor's weak bargaining power* - Subcontractors often have unequal negotiating power with prime contractors due to the sheer size of the top parties and the presence of a "next job syndrome". Some of the problems faced by subcontractors include the "hawking" of prices by prime contractors in order to obtain lower prices from others (i.e. the practice of "Dutch Auctioning"); the risk of non-payment; and the use by prime contractors of subcontractors' monies as an interest free overdraft facility and the lack of representation or participation by subcontractors in trade associations or at forums. In a case study, Packham et al. (2000) describes how a subcontractor was "bullied" and "treated with little respect" by the main contractor. Hancke (2000) also describes the bargaining power of large French firms over their smaller suppliers and the consequent asymmetric relationship between them. Both studies attribute the situation to the subcontractors' lack of bargaining power over their main contractors. In Japan, Reeves (2001) concludes that "the relationship remains unilateral with contractors exercising authoritative control over smaller subcontractors and often enjoying huge profits at the expense of subcontractors". When jobs are plenty, subcontractors are willing to cooperate due to the prospect of repeat business.

*Contractors' pressures-related challenges* - Subcontractors are at times pressed by main contractors to carry out increasingly complex tasks under very competitive conditions (Wyman, 2007). The most important one relates to the subcontractors' ability to continue in business when contractors squeeze profit margins. Low profitability levels of many subcontractors may result in insufficient future investments in technology and product development.

*Challenges of subcontractors also acting as contractors* - Contracting is becoming increasingly attractive for the subcontractors themselves as this option allows them to gain in competitiveness (Gubik, 2005). However, this trend is also posing an additional challenge for subcontractors for successfully managing and coordinating their own sub-subcontractors, network of suppliers.

*Economic cycle and business environment-related challenges* - Subcontractors are affected by external business and the regulatory and macroeconomic environment, e.g. taxation, political

stability, inflation, infrastructures, red-tape procedures and regulations (OECD, 2005a, Berry, 1997).

*Finance-related challenges* - It is a well-known fact that limited access to finance is one of the main business constraints. Difficulties in having access to funding hampers many subcontractors to introduce the necessary innovations that would allow them to ensure, strengthen or upgrade their position in the production chains. Late payment practices influence subcontractors' financial position and this may adversely affect their performance on a project. Also, the typical unclear contractual agreements between contractors and subcontractors have aggravated the problem. Late payments are a major issue in subcontractor relations. Many firms do not have large financial reserves. If they act as subcontractors in a project, they have to pay their workers, the materials, the interest on their equipment, taxes, etc. If the contractual payments by the main contractor are delayed, they may run into problems. Standard contracts e.g KABCCEC through subcontracting documents have been implemented to include payment clauses. However, when problems arise, subcontractors are disinclined to take legal actions against the main contractor, as they do not like to destroy previously good relations or jeopardise future business. In some contracts, nominated subcontractors are directly paid by the client. This is considered as one of the ways to fight late payments. Governments at all levels are important clients of the construction industry. As a consequence, public procurement is an important issue for construction enterprises. Many contracts are too large to be handled by micro and small enterprises. Only medium-sized and large enterprises have the capacity, experience, and management tools to handle large projects. Smaller enterprises may then participate in these projects as subcontractors.

*Managerial-related challenges* - The lack of managerial capacities required for dealing with complex tasks can become a major constraint for subcontractors against their successful response to the challenges of subcontracting.

*Site safety, or the lack of it* - Though sometimes some subcontractors initiate technological change, the vast majority of them are small and do not have the incentive, let alone resources, to

# CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

## 3.10 INTRODUCTION

This chapter describes the procedure that has been followed in conducting this research study. The study aims at identifying the problems associated with subcontracting in the building sector of the construction industry and how those problems affect the performance of projects. The research study therefore sought to obtain data in relation to:

- Specific reasons for subcontracting in the Kenyan construction industry.
- i. The scope of subcontracted works in Kenya.
- ii. The various ways of subcontractor procurement.
- iii. Contract arrangements between main contractor and subcontractors.
- iv. Contractual and operational challenges both main contractors and subcontractors in a construction project face because of the fact of the existence of the subcontracting.

Finally, from the data collected, the study recommends ways to improve the main contractor-subcontractor relationships for effective performance in projects. This chapter is organized as follows;

- a. Overall research strategy – describes how the researcher intends to implement own research study i.e the strategy to be adopted in completing own empirical study.
- b. The population
- c. Determining the size of population
- d. The sample size
- e. Sampling procedures
- f. Data collection
- g. Data recording.

### 3.20 OVERALL RESEARCH STRATEGY

A variety of approaches could have been chosen to achieve the objectives of this study, but a survey method was chosen as the research strategy. According to Leedy & Ormrod (2005),

“Survey research involves acquiring information about one or more groups of people perhaps about their characteristics, opinions, attitudes, or previous experiences . . .” A survey is a non-experimental, descriptive research method. It is an attempt to collect data from members of a population in order to determine the current status of that population with respect to one or more variables (Mugenda & Mugenda, 2003).

A common goal of survey research is to collect data representative of a population. The study uses information gathered from survey to generalize findings from a drawn sample back to a population, within the limits of random error. The survey research was effective in this study since the researcher was able to obtain data from a representative population in which they gave their experiences with regard to the aspects of contractor-subcontractor relationship. The survey method enabled the researcher seek representative views from contractors, specialist contractors and architects about main contractor-subcontractor relationships. That way, the study objectives were appropriately accomplished.

This study also adopted case study as a research strategy in that the researcher only studied the Kenyan construction industry and particularly in Nairobi. A case study is a study of one example of a particular type. Cohen & Manion (1995) describe a case study thus; “The case study researcher typically observes the characteristics of an individual unit – a region, a class, a school, a community.” The purpose of such observation was to probe deeply and analyse intensely the multifarious phenomena that contribute the life cycle of the unit. The case study approach was appropriate for this research study since it created the opportunity to probe deeply and analyse intensely the main contractor – subcontractor practices in the Kenyan construction industry.

This study combined both quantitative and qualitative research. Quantitative research because it was concerned with quantities and measurements (such as identifying how contractors procure subcontractors, the scope of works subcontracted). The study also had a qualitative aspect. Qualitative research is a type of research linked to in-depth exploratory studies, where the opportunity for quality responses exists. Denzin & Lincoln (1994) hold that qualitative research involves studying things in their natural settings attempting to make sense of or interpret,

invest in technology. By and large, building operations have remained craft-based over the years because of labour-intensive operations. Due to the heavy reliance on construction labour, there have been alarming instances of site accidents. Subcontractors and their workers, being the front-line operators on site, are the ones with the highest liability for site safety. However, they are also poor in safety management.

*Corruption* - The construction industry is notorious for its rampant corruption. A research done in Hong Kong (Yan Chyuan et al., 1998) revealed that having secured contracts through unrealistically low bids, some contractors and subcontractors would choose to cut corners and offer bribes to recover losses. Whilst the long-term relationship between contractors and subcontractors supports the cultivation and maintenance of trust and the development of tacit knowledge, it could also lead to a network of relationships that is “nepotistic and corrupt”.

## **2.80 COPING MECHANISMS**

The primary objectives of every main contractor and subcontractor is to successfully deliver to the owner the construction project safely, on time, within budget, at the desired quality and achieve a reasonable profit in return for performance of its work. No general contractor can deliver a project successfully without cooperation of competent subcontractors. Similarly no subcontractor regardless of skill and experience in its specialty can perform its work successfully without the corresponding measure of cooperation and leadership of the general contractor. Both seek business relationship on which they can depend. Skill, integrity, fairness, trust, respect and responsibility make the contractual relationship now and in future, possible, profitable and pleasant (Thomas et al. 2009).

A contract establishes the framework for the relationship between contractor and subcontractor. To foster cooperation, the contract should be fair to both parties and non-adversarial. Key to successful construction relationship is mutual trust which must be nurtured to develop a positive project culture. Working together harmoniously, without unduly delaying or damaging others is a highly complex task requiring utmost coordination, cooperation, communication and sometimes

compromise. This makes a project profitable and the construction industry rewarding (Guidelines for successful for contractors, 2008).

In order for a construction project to be deemed successful, both the contractors and subcontractors must work together as a team to:

- a) Emphasize cooperation and clearly define common objectives and goals
- b) Recognize respect roles of other team members
- c) Develop synergistic systems for rapid issue resolution

One way to achieve the goal of cooperation is through a strategy and process called partnering. Partnering is a strategy for building relationships based on trust, honesty and respect. The key elements of partnering are commitment, communication and conflict resolution (Kumaraswamy & Mathews 2000). Development of common goals and objectives is a coping mechanism for both contractors and subcontractors. Successful construction do not simply happen, they are made to happen.

To improve the relationships between main contractor and subcontractors, Palaneeswaran et al., (2002) have proposed the adoption of relational subcontracting as a means of optimizing project outcomes. Under such an arrangement, it is necessary for the main contractor to work with the subcontractors as a 'team' with emphasis on 'best value' rather than 'lowest price.'. These 'good practices' have chance of leading to project success if the subcontractors involved are capable of completing their tasks satisfactorily.

## **2.90 THE FUTURE IN MAIN CONTRACTOR-SUBCONTRACTOR RELATIONSHIP**

Partnering and other close organisational relationships have yielded considerable benefit to the client-principal contractor relationship. These benefits will be mirrored in contractor-subcontractor transactions within the construction procurement process as contractors explore options for achieving further productivity improvements. The viability of the main contractors has become inextricably tied to the efficient performance of their subcontractors (mainly their smaller counterparts). It is imperative that these two categories involved in the supply chain of

the construction process should seek greater alignment of their organisations. Such a development takes on added urgency given the rate of growth in the number of small enterprises within the construction industry.

The role and relationship of the various players of the industry's value-creating chain will have to be reexamined to define new inter-linkages that facilitate the interest of all the participants in the industry. A co-contracting agenda where close association between major construction companies and smaller companies will provide one option for achieving the flexibility and capacities required for attaining the required present and future competitiveness. For the construction industry, this can best be achieved through a co-contracting agenda between the principal contractor and the subcontractors it relates to within the supply chain. The only way the large companies can continue to succeed in an increasingly competitive world after considerable productivity gains in operational processes is to focus on such organisational relationships and interfaces. Within the UK, the ethos of such a co-contracting agenda is reflected in the various industry reports that focus on options for improving productivity within the construction industry (Latham, 1994).

Partnering is a way to create effective collaboration between the project's actors. Effective collaboration is claimed to lead to fewer disputes, lower construction costs and a better quality product. Positive experiences of partnering in the USA, UK, Norway and Denmark have led to the partnering concept being adopted in Sweden.

One of the goals of partnering is better utilization of the overall qualifications of the project actors. The concept of trust is tightly connected to partnering. Trustful relationships between project actors result in a more effective risk allocation process, decrease of contingency funds and, finally, to project cost reduction (Zaghloul & Hartman 2003).

## **2.100 SUMMARY OF THE LITERATURE REVIEW**

This chapter has defined subcontracting and provided a background study on the aspects of subcontracting; its history, the four different types of subcontracting – Nominated, domestic,



approved and labour-only subcontracting. The type of subcontracting can be differentiated through two ways; whether the main contractor had complete choice over the subcontractor to appoint and whether the main contractor was asked to submit a list of subcontractors to engage. The concept of construction project performance is highlighted with the three pillars of performance clearly explained that is, time, cost and quality. The procurement of subcontractors and the selection methods and criteria for subcontractors is also discussed. The problems encountered in subcontractor selection are discussed.

The literature on the reasons for subcontracting, contract arrangements made between main contractors and subcontractors including the critical provisions in subcontract agreement are highlighted. Further, the relationship between main contractors and subcontractors is studied as well as the challenges and the coping mechanisms. The next chapter investigates the practice of subcontracting and the factors influencing the main contractor-subcontractor relationship in the construction industry, with a sample population.

## **CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY**

### **3.10 INTRODUCTION**

This chapter describes the procedure that has been followed in conducting this research study. The study aims at identifying the problems associated with subcontracting in the building sector of the construction industry and how those problems affect the performance of projects. The research study therefore sought to obtain data in relation to:

- i. Specific reasons for subcontracting in the Kenyan construction industry.
- ii. The scope of subcontracted works in Kenya.
- iii. The various ways of subcontractor procurement.
- iv. Contract arrangements between main contractor and subcontractors.
- v. Contractual and operational challenges both main contractors and subcontractors in a construction project face because of the fact of the existence of the subcontracting.

Finally, from the data collected, the study recommends ways to improve the main contractor-subcontractor relationships for effective performance in projects. This chapter is organized as follows;

- a. Overall research strategy – describes how the researcher intends to implement own research study i.e the strategy to be adopted in completing own empirical study.
- b. The population
- c. Determining the size of population
- d. The sample size
- e. Sampling procedures
- f. Data collection
- g. Data recording.

### **3.20 OVERALL RESEARCH STRATEGY**

A variety of approaches could have been chosen to achieve the objectives of this study, but a survey method was chosen as the research strategy. According to Leedy & Ormrod (2005),

“Survey research involves acquiring information about one or more groups of people perhaps about their characteristics, opinions, attitudes, or previous experiences . . .” A survey is a non-experimental, descriptive research method. It is an attempt to collect data from members of a population in order to determine the current status of that population with respect to one or more variables (Mugenda & Mugenda, 2003).

A common goal of survey research is to collect data representative of a population. The study uses information gathered from survey to generalize findings from a drawn sample back to a population, within the limits of random error. The survey research was effective in this study since the researcher was able to obtain data from a representative population in which they gave their experiences with regard to the aspects of contractor-subcontractor relationship. The survey method enabled the researcher seek representative views from contractors, specialist contractors and architects about main contractor-subcontractor relationships. That way, the study objectives were appropriately accomplished.

This study also adopted case study as a research strategy in that the researcher only studied the Kenyan construction industry and particularly in Nairobi. A case study is a study of one example of a particular type. Cohen & Manion (1995) describe a case study thus; “The case study researcher typically observes the characteristics of an individual unit – a region, a class, a school, a community.” The purpose of such observation was to probe deeply and analyse intensely the multifarious phenomena that contribute the life cycle of the unit. The case study approach was appropriate for this research study since it created the opportunity to probe deeply and analyse intensely the main contractor – subcontractor practices in the Kenyan construction industry.

This study combined both quantitative and qualitative research. Quantitative research because it was concerned with quantities and measurements (such as identifying how contractors procure subcontractors, the scope of works subcontracted). The study also had a qualitative aspect. Qualitative research is a type of research linked to in-depth exploratory studies, where the opportunity for quality responses exists. Denzin & Lincoln (1994) hold that qualitative research involves studying things in their natural settings attempting to make sense of or interpret,

phenomena in terms of the meanings people bring to them. In this study, the researcher was interested in determining why contractors prefer certain ways of procurement for subcontractors or why they opt for certain method of contract arrangement with subcontractors.

### 3.30 THE POPULATION

Leedy et al, (2005) state that '*a population is any set of persons or objects that possesses at least one common characteristic*'. The population in this study comprised of:

- a. All registered building contractors with the MoPW in category A-D since these are contractors who handle building projects with a magnitude of Ksh.50million and above. Contractors in Class A-D are involved in big projects and therefore provide a more formal subcontracting approach which more readily renders itself to a study of this nature. The MoPW is not the sole body that registers contractors however, the Ministry registers most building contractors in the country hence this was convenient for the researcher in obtaining a sample for the study.
- b. All registered specialist contractors with the MoPW under all categories of registration Class (A-H). Most specialist contractors are registered with the Ministry of Public works than any other bodies. Therefore, the researcher found it suitable to obtain the names of specialist contractors from the register by MoPW.
- c. All architectural firms with offices based in Nairobi. Architects are usually given the responsibility of leading the project and advising clients on issues to deal with engagement of other parties in the project. They participate in nomination or approval of subcontractors. In most cases, the Architect is the lead consultant on site therefore familiar with the procurement of parties and their dealings on site. The Board of Registration of Architects and Quantity Surveyors (BORAQS) require all practicing architectural and quantity surveying firms to register not only with the Registrar of companies but also with the Board. The Board therefore, was the best source of the most comprehensive list of architectural firms in the country since it also indicated both the physical and postal addresses of the various firms. A list from the Board of Registration of Architects and Quantity Surveyors (BORAQS) indicated that there were 361 registered Architectural firms as of January, 2011.

### 3.40 DETERMINING THE SIZE OF POPULATION

Evidence shows that construction industry activities in developing countries are concentrated in capital cities, and most construction firms involved in the construction activities locate in the capital cities (Talukhaba, 1999; Habitat, 1982).

The population of construction firms was within the geographical boundaries of the city of Nairobi, and as per the total population of firms registered by the Ministry of Public Works under various registration categories. According to a pilot survey carried out in January 2011, there were 3268 building contractors and 241 specialist contractors as shown in table 3.1 and 3.2:

**Table 3.1: Registered Building Contractors as at January, 2011**

Category of Registration	A	B	C	D	E	F	G	H	Total
Number in the Category	198	176	127	263	513	620	681	690	3268

Source: Ministry of Works Register of Contractors, January 2011

**Table 3.2: Registered Specialist Contractors as at January, 2011**

Category of Registration	A	B	C	D	E	F	G	H	Total
Number in the Category	57	27	43	19	32	22	24	17	241

Source: Ministry of Works Register of Contractors, January 2011

Further these companies were broken down as per table 3.3, with respect to the value of work they can undertake at any one given project.

**Table 3.3: Category of main contractors and the value of work undertaken**

<b>Category</b>	<b>Number Registered</b>	<b>Value of Work Undertaken (Kshs.)</b>
A	198	Unlimited
B	176	Upto to 100,000,000.00
C	127	Upto to 75,000,000.00
D	263	Upto to 50,000,000.00
E	513	Upto to 25,000,000.00
F	620	Upto to 10,000,000.00
G	681	Upto to 5,000,000.00
H	690	Upto to 2,000,000.00
<b>TOTAL</b>	<b>3268</b>	

Source: Ministry of Works Register of Contractors, January 2011

From the above sampling frame of Building contractors, there were 764 construction firms registered under categories A, B, C and D by the Ministry of Works as at January 2011.

Out of the 764 construction firms, 488 had offices registered in Nairobi and 276 outside Nairobi. That is Mombasa, Kisii, Nyeri, Nakuru, Machakos, Kitale, Kakamega, Malindi, Kabarnet, Oyugis, Ruiru, Kiambu, Maragoli, Kericho, Marsabit, Kimilili, Iten, Kamiti, Mandera, Bungoma, Karatina, Kerugoya, Makuyu, Homabay, Kajiado and Nyahururu (Ministry of Public Works Register of Contractors, 2011).

The specialist contractors were in different categories of specialization that is specialists in air conditioning, electrical installation, mechanical installations, lift installations, plumbing and drainage installations, structural steelworks, roofing fabrications and fire fighting installations.

The total number of registered specialist contractors was 241 with 182 having postal addresses for Nairobi while 59 had for outside Nairobi. The MoPW register together with the Kenyan directories (Yellow pages) were used to establish the address and location of the specialist subcontractors.

A list of the registered Architectural firms was obtained from the Board of Registration of Architects and Quantity Surveyors of Kenya. It indicated a total of 361 architectural firms. Those with postal addresses in Nairobi were 162 while the rest were outside Nairobi.

**Table 3.4: Registered main contractors (Class A-D) and their location**

<b>Construction Firms</b>	<b>With offices registered in Nairobi</b>	<b>With offices registered out of Nairobi (Other Towns)</b>	<b>Total</b>
Class A contractors	120	78	198
Class B contractors	118	58	176
Class C contractors	93	34	127
Class D contractors	177	86	263
Total	508	256	764
Percentages	66%	34%	100%

Source: Own Pilot Survey Ministry of Works, January, 2011

**Table 3.5: Registered specialist contractors and their location**

<b>Specialist Construction Firms</b>	<b>With offices registered in Nairobi</b>	<b>With offices registered out of Nairobi (Other Towns)</b>	<b>Total</b>
Specialist contractors	182	59	241
Percentages	76%	24%	100%

Source: Own Pilot Survey Ministry of Works, January, 2011

**Table 3.6: Architectural firms and their location**

<b>Architectural Firms</b>	<b>With offices registered in Nairobi</b>	<b>With offices registered out of Nairobi (Other Towns)</b>	<b>Total</b>
Architectural Firms	162	99	261
Percentages	62%	38%	100%

Source: Own Pilot Survey BORAQS, January, 2011

As indicated on tables 3.4, 3.5 and 3.6 above, the results show that 66% of the Contractors, 76% of the specialist contractors and 62% of the architectural firms are located in the city of Nairobi and this make up a significant number for the target population in the study. The number of firms located outside Nairobi indicated 34%, 24% and 38% for contractors, specialist contractors and architectural firms, respectively.

The geographical study area was Nairobi. Therefore, only registered firms with Nairobi addresses were considered for this study.



### 3.50 THE SAMPLE SIZE

Leedy (1985) and Mugenda et al. (2003) argue that the rule of thumb should be to obtain as big a sample as possible. However, time and resources tend to be the major constraints in deciding on the sample size to use. In social science research the following formula can be used to determine the sample size (Chara, et al. (1996)

$$n = \frac{Z^2 \cdot pq \cdot N}{e^2(N-1) + Z^2 \cdot pq}$$

Where,

N = size of the population

n = sample size

p = sample proportion in the target population estimated to have characteristics being measured

q = 1-p

e = acceptable error

Z = value of the standard Variant at confidence level

A confidence level of 95% was used in this research study. This was satisfactorily interpreted to mean that the probability was within either plus or minus 5% of the true state of affairs in the construction industry. Previous researchers argue that it is necessary to sample more than 10% of the population to obtain adequate confidence, providing the resulting sample size is less than 1000units. Mutai (2000) argues that the sample size depends on the level of precision required in the estimates, the intrinsic level of variability of the variable to be estimated and the sample design to be used. Thus the more precise the estimates are required to be the smaller the standard error, and the larger the sample size must be.

Leedy (1985) argues that the researcher should consider three factors in making any decision as to the sample size. The degree of precision required between the sample population and the general population, what the variability of the population is (standard deviation) and what method of sampling should be deployed. Rudestam et al. (2001) argues that a sample size is a function of the following:

- i) Variability in the population

- ii) The precision or accuracy needed
- iii) The confidence level desired
- iv) Type of sampling plan used (random or stratified and the size of the population used)
- v) Cost and time restraints

Fowler (1993) and de Vaus (2003) argue that, there is rarely any particular sample size in any research study. However, the size of a sample is a compromise between the funds available for conducting the research, time for the study, access to the potential participants, the research design techniques used, the degree of precision, accuracy required and finally the nature of the research study itself (Masu, 2006).

The aforementioned are various ways of obtaining the sample size in a study, however, in determining the sample size for this study, the researcher considered variability of the population in that the research required three different sets of population who have varied characteristics in their areas of specialization. The time and cost constraint met also influenced the size of sample population obtained. The method of sampling adopted was another factor considered in determining the sample size. Therefore, the sample sizes determined in this study are justifiable.

**Table 3.7: Main contractor firms with postal addresses in Nairobi**

<b>Construction Firm</b>	<b>Total Population</b>	<b>Not Traceable in Directories</b>	<b>Traceable in Directories</b>
Main Contractors (Class A-D)	508	236	272
<b>Total</b>	<b>508</b>	<b>236</b>	<b>272</b>

Source: Field Study, January, 2011

**Table 3.8: Specialist contractor firms with postal addresses in Nairobi**

<b>Specialist Contractors Firm</b>	<b>Total No.</b>	<b>Not Traceable in Directories</b>	<b>Traceable in Directories</b>
Specialist contractors	182	146	36
<b>Total</b>	<b>182</b>	<b>146</b>	<b>36</b>

Source: Field Study, January, 2011

**Table 3.9: Registered architectural firms with postal addresses in Nairobi**

<b>Architectural Firm</b>	<b>Total No.</b>	<b>Not Traceable in BORAQS or A.A.K Listing</b>	<b>Traceable in Listings</b>
Architectural Firms	162	123	39
<b>Total</b>	<b>162</b>	<b>123</b>	<b>39</b>

Source: Field study, January, 2011

Tables 3.7, 3.8 and 3.9 show the number of firms that could be traced from either directories or the BORAQS and AAK listings since this was important in determining how many firms were accessible for the study and therefore could be considered in obtaining the sample size. To obtain the sample size, various factors were considered as noted in the previous section on determination of sample size. Therefore, the sample size was taken as main contractors 103, specialist subcontractors 26 and architectural firms 29. The sampling procedure is detailed below.

### 3.60 SAMPLING PROCEDURES

A sample is a finite part of a statistical population whose properties are studied to gain information about the whole (Webster, 1985). When dealing with people, it can be defined as a set of respondents (people) selected from a larger population for the purpose of a survey. Sampling is the act, process, or technique of selecting a suitable sample, or a representative part of a population for the purpose of determining parameters or characteristics of the whole population (Webster, 1985).

Leedy et al. (2001) define a sample as a group of people, objects, or items that are taken from a larger population for measurement. The sample should be representative of the population to ensure that one can generalize the findings from the research sample to the population as a whole. There would be difficulties measuring whole population because of the large size of population, inaccessibility of some of the population. Some populations are so difficult to get access to that only a sample can be used. The accuracy and sampling, a sample may be more accurate than the total study population. A badly identified population can provide less reliable information than a carefully obtained sample (Leedy et al., 2001).

A sample design is a definite plan determined before any data are actually collected for obtaining a sample from a given population. There can be probability and non-probability samples. Probability samples are those based on simple random sampling, systematic sampling, stratified sampling, cluster/area sampling whereas, non-probability are those based on convenience sampling, judgement and quota sampling techniques. This study adopted the following sampling techniques.

Within a quantitative survey design, determining sample size and dealing with non response bias is essential. "One of the real advantage of quantitative methods is their ability to use smaller groups of people to make inferences about larger groups that would be prohibitively expensive to study," (Holton & Burnett, 1997).

### 3.6.1 STRATIFIED SAMPLING

This was the first stage in obtaining sample for the Main Contractor firms. Stratified sampling design is applicable where the population from which a sample is drawn does not constitute a homogeneous group. In this technique, the population is stratified into a number of non-overlapping sub populations or strata and sample items are then selected from each stratum. Stratified sampling is a commonly used probability method which reduces sampling error.

A stratum is a subset of the population that share at least one common characteristic. In this research, the strata used to group the population for ease of further handling was the categories of registration for the contractors by the Ministry of Public Works which are class A, B, C and D. The researcher first identified the strata and their actual representation in the population. A list was prepared for the firms under each category (A-D). This stage of sampling did not apply for the subcontractor firms since all categories of registration for the subcontractors could be represented in the sample but not specific categories.

### 3.6.2 RANDOM SAMPLING

This was the second stage of sampling for the Main contractor firms and the sampling procedure for the subcontractor firms. Random sampling is also referred to as chance sampling or probability sampling where each and every item in the population has an equal chance of inclusion in the sample and each one of the possible samples has the same probability of being selected. It consists of having a population whose texture or character is homogeneous. The derivation of the sample is by means of simple randomization process. Random sampling was used to select a *sufficient* number of subjects from each stratum. "*Sufficiency*" in a sample size adds to validity of the study (Leedy, 2001). In getting the required sample through random sampling, with the list of Main contractor firms, in Stage 1, the researcher wrote the name of each firm in a paper and folded the papers to hide the names. All the papers were mixed up. The researcher then randomly picked up papers equivalent to the required number of the sample (103 contractors). This meant that each firm was given equal chance of being included in the sample. Therefore, only the randomly picked papers (firms) were included in the sample. The same method was used in picking the firms to include in the sample for 26 subcontractors.

### 3.6.3 SYSTEMATIC SAMPLING

This was the sampling procedure for the Architectural firms. Systematic sampling occurs when a sample of the target group is taken at equal or regular intervals. This method was used to pick the sample for the Architectural firms with addresses for Nairobi. A list was prepared for all the firms and every fourth firm was picked from the list until the sample size of 29 architectural firms was reached.

### 3.70 DATA COLLECTION

The data collection method used in the study was questionnaires.

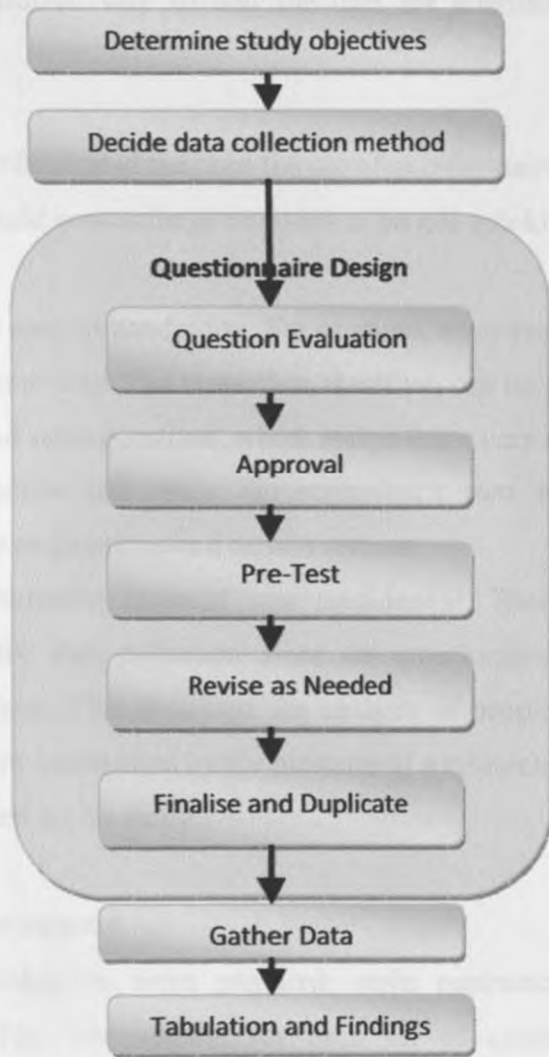


Figure 3.1: The Questionnaire Development Process

Source: Leedy et al, 2005)

### 3.7.1 DETERMINING METHOD OF DATA COLLECTION

In determining the data collection method to be used, the study objectives were considered. The study aimed at obtaining information on the need for subcontracting, the extent of its practice in the construction industry and challenges faced in the practice which could have effect on the performance of construction projects. Considering the nature and type of information required from the population in order to achieve the study objectives, questionnaires were found to be the most appropriate tool of data collection compared to interviews or experiments. A questionnaire is the main means of collecting quantitative data. A questionnaire enables quantitative data to be collected in a standardized way so that the data are internally consistent and coherent for analysis.

The following factors facilitated the need for use of questionnaires as opposed to interviews:

- a) The researcher would contact large numbers of people quickly, easily and efficiently through hand delivery.
- b) A questionnaire is easy to standardise. For example, every respondent is asked the same questions in the same way. The researcher, therefore, can be sure that everyone in the sample answers exactly the same questions, which makes this a very reliable method of research.
- c) Questionnaires reduce bias since the researcher's own opinions do not influence the respondent to answer questions in a certain manner.
- d) The kind of information required was confidential. Therefore questionnaires were the appropriate tool for data collection since the questionnaires were both anonymous and completed in privacy. This increased the chances of people answering questions honestly because they are not intimidated by the presence of a researcher.
- e) Time limits imposed on the study.

### 3.7.2 QUESTIONNAIRE DESIGN

Three sets of questionnaires were prepared; main contractors, specialist contractors and architectural firms. The first section for each set of questionnaire covered background information. This part investigated the personal profile of the respondent and further, the profile

of the company and their practises. In the subsequent sections of the questionnaire, questions formulated to address specific objectives of the study were grouped together in the questionnaire. The main contractors and subcontractors were the key population in the study since the study revolved around their relationship. Their questionnaires were designed to capture data with regard to information on the scope of subcontracted works, ways of communication between main contractors and subcontractors, the importance of subcontracting, selection of subcontractors, procedure of selection, considerations during selection, preference of various methods of subcontractor selection, contract arrangements, problems associated with the same and how these affected performance of projects.

The architectural firm's questionnaire was designed to mainly obtain information relating to the architects preferences in selection of subcontractors, subcontracting arrangements and their views on what measures should be taken to ensure that subcontractors improve their performance. The questionnaires comprised mainly of closed questions which made it easy for the researcher to analyse the data collected. For instance, all questions under the section for background information of the respondents were closed. Some questions were open in order to give the respondents a chance to expand on their responses or even express their views or opinions on certain aspects of the study. This enabled the researcher gather more information that would otherwise be on closed questions.

### 3.7.3 PILOT-TESTING OF THE QUESTIONNAIRE

The aim of testing questionnaires is to minimize measurement error. Pilot testing of the questionnaires was done before sending the questionnaires to the field. The questionnaires were pretested on small target group, that is, five respondents for each set of questionnaires. The pilot group was given the same information or instructions that were intended to be given to the target group and a deadline to complete the questionnaires. The main focus was to ascertain the respondent's ability to answer questions without error.

Generally, pilot testing of the questionnaire enabled the researcher identify:

- o that each question measured what it was supposed to measure



- o that the questions as worded would achieve the desired results.
- o that all respondents interpret the question in the same way.
- o that all response choices were appropriate.
- o that the range of response choices was actually used.
- o that the respondents correctly followed directions.
- o that the questions had been placed in the best order
- o how long it took to complete the questionnaire.
- o that it collected the information required.

The exercise was done to improve on the quality of data collected. The final form of questions and questionnaire incorporating all amendments from the pilot study was prepared and circulated to the target group.

#### **3.7.4 ADMINISTRATION AND MANAGEMENT OF THE QUESTIONNAIRE**

Research assistants were employed to assist in administration and management of the questionnaires. The researcher trained all the research assistants with regard to the aim of the study and administration of questionnaires. For ease of circulation of the questionnaires, a list of the sample group was prepared with their physical addresses. The geographical area of study (Nairobi) was divided into zones according to the physical locations of the target firms and each research assistant was allocated a zone.

The three set of questionnaires were each given an identification number, with Main contractors as *MC01*, *MC02*, etc, subcontractors as *SC01*, *SC02*, etc while for the architectural firms were coded as *A01*, *A02*, etc. The questionnaires were hand delivered to the respondents and each was expected to complete filling the questionnaires within a week, although some respondents returned their questionnaires earlier after completing. The research assistants picked back the filled questionnaires. After collection all the returned questionnaires were separated into the three different sets and coded and the response rates recorded.

The response rate from the field study was as shown in the tables below:

**Table 3.10: Main Contractor's response rate**

<b>Contractors</b>	<b>Sample size</b>	<b>Responsive Firms</b>	<b>Response Rate</b>
Class A	30	30	100%
Class B	20	12	60%
Class C	17	12	70.5%
Class D	36	35	97.2%
<b>Total</b>	<b>103</b>	<b>89</b>	<b>86.4%</b>

Source; Field Survey October, 2011

**Table 3.11: Specialist Contractor's response rate**

<b>Contractors</b>	<b>Sample size</b>	<b>Responsive Firms</b>	<b>Response Rate</b>
Specialist contractors	26	20	<b>76.9%</b>

Source; Field Survey October, 2011

**Table 3.12: Architectural Firms response rate**

<b>Architects</b>	<b>Sample Size</b>	<b>Responsive Firms</b>	<b>Response Rate</b>
Architects	29	21	<b>72.4%</b>

Source; Field Survey October, 2011

There is no agreed upon standard for a minimum acceptable response rate, however, Fowler (1993) argues that academic survey organizations are able to achieve 75% and above response rates which are considered accurate. Mugenda & Mugenda (2003) argues that response rates that are at 70% are considered a strong basis and also adequate. Babbie (2007) suggested that any return rate of over 50% can be reported, that over 60% is good, and that over 70% is excellent as indicated by the survey's response rate.

The response rate realized by this study in the three categories of respondents were; main contractors 86.4%, specialist contractors 76.9% and architectural firms 72.4%. The researcher therefore considers that the general response rate is very good and sufficient for data analysis, reporting and drawing conclusions.

### 3.7.5 DATA RECORDING

From the data received from each set of questionnaires, the scores were summarised for all the questions.

## **CHAPTER FOUR: DATA PRESENTATION AND ANALYSIS**

### **4.10 INTRODUCTION**

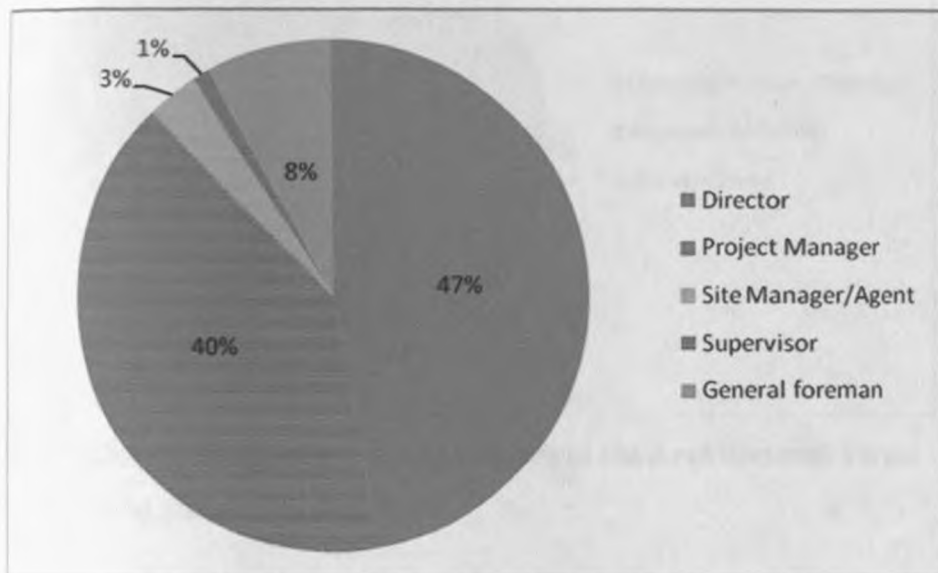
This chapter focuses on the presentation and the analysis of data obtained from the field. The field survey was set out to investigate the effect of main contractor-subcontractor relationships on the performance of a construction project. The aim was to establish the reasons why contractors subcontract works, determine the scope of subcontracted works as well as establish the ways of procurement of subcontractors and the contract arrangements made between the main contractors and subcontractors. The contractual and operational challenges that face both main contractors and subcontractors were also identified. All these are factors of relationship that may influence the performance of a construction project.

The responses were statistically evaluated as shown in the preceding paragraph. The first method was the frequency technique in which the percentage values are calculated for the frequency of each answer. The second is the 5-point Likert scale method. In the Likert scale (David & Ronald, 1987) 5,4,3,2 and 1 respectively represent 'most important', 'important', 'somewhat important', 'least important' and 'not important', in other cases it meant 'most influential', 'influential', 'somewhat influential', 'least influential' and 'not influential'. For analysis of this type of questions, the total number of rating per factor (TR) was divided by the total number of responses to obtain the mean rate (MR). The MR was then used to rank the factors. To present the data, Statistical Package for Social Sciences (SPSS 13.0) was used. The data is also presented in form of tables, charts, graphs depending on suitability of the tool and data being handled at any one time.

### **4.20 GENERAL CHARACTERISTICS OF THE POPULATION**

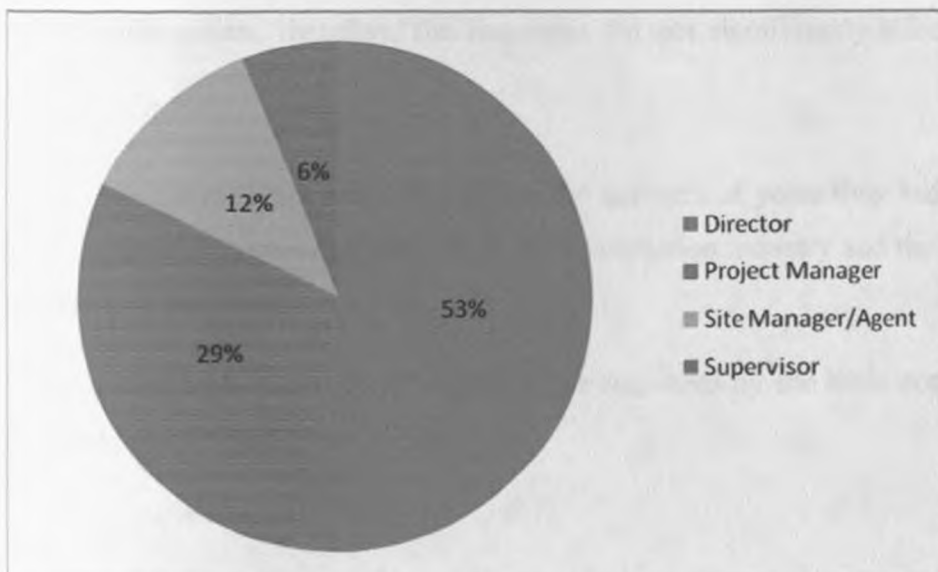
The first section in each of the three set of questionnaires was intended to determine the respondent's competence in answering the questionnaire and their professional expertise in the construction industry. The background information determined the respondent's job designation in the firm, the number of years he/she served in the company, and their years of working

experience in the construction industry. The characteristics of the surveyed firms including the respondent's characteristics and the structures of the construction companies were revealed by the survey results in figures 4.1, 4.2 and 4.3 below.



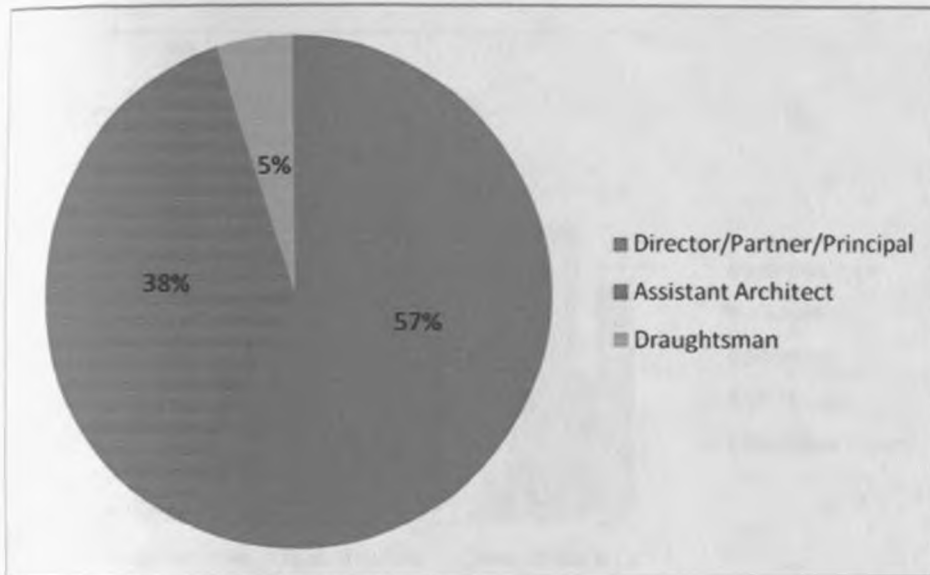
**Figure 4.1: Job designation of respondents in the Main contractors Firms**

Source; Field Survey October, 2011



**Figure 4.2: Job designation of respondents in the Specialist Contractors Firms**

Source; Field Survey October, 2011



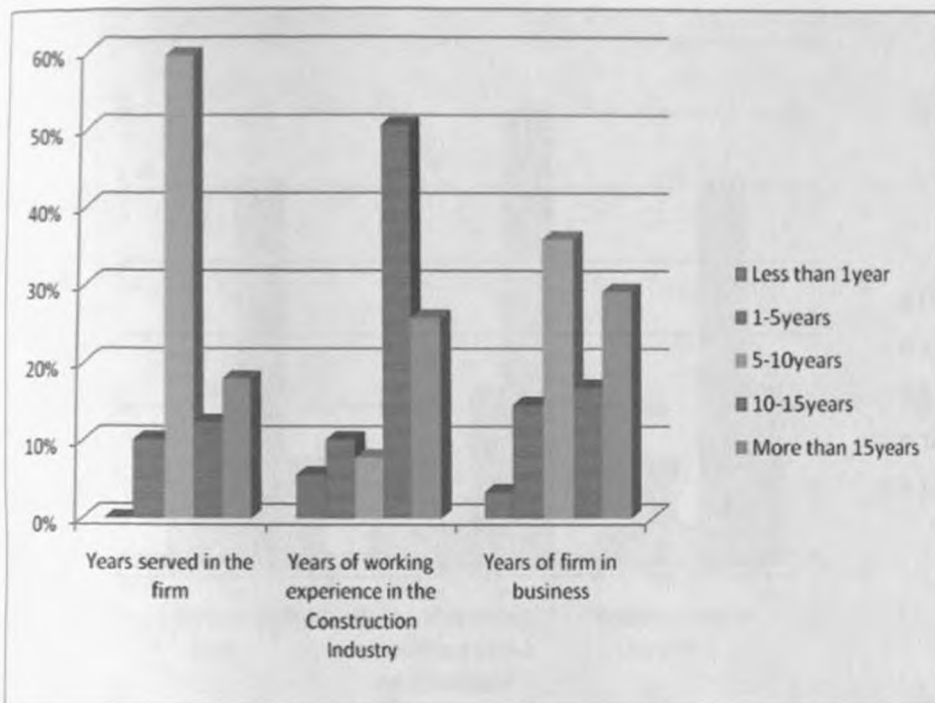
**Figure 4.3: Job designation of respondents in the Architectural Firms**

Source; Field Survey October, 2011

Given that the respondents were in different job designations, they had different exposure to technical and managerial operations in the firm. However, the information sought in the questionnaires is fairly of standard management skills and the respondents had access to the required information, therefore, the responses did not significantly affect the outcome in the study.

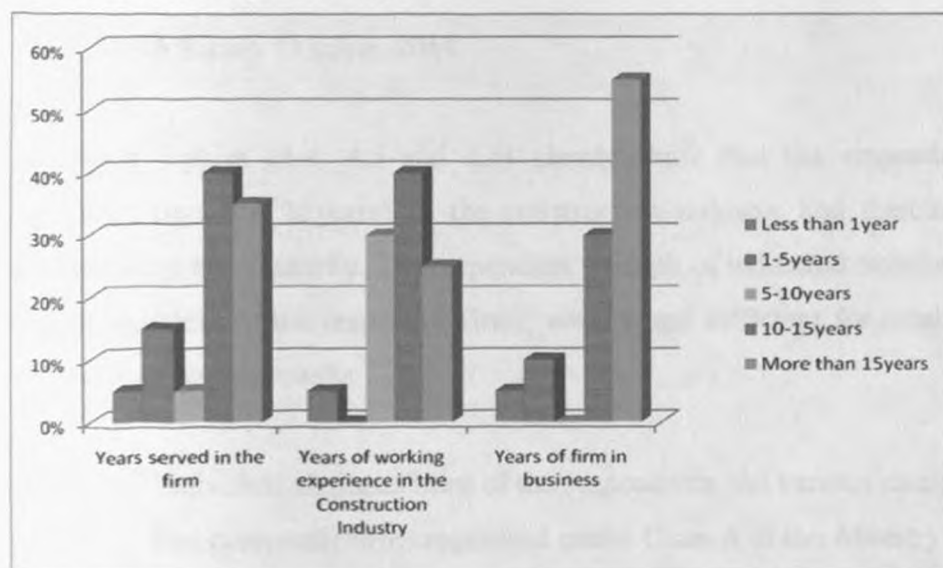
All the respondents were asked to indicate the numbers of years they had served in the current firm, the years of working experience in the construction industry and the number of years their firms were in business.

The following table 4.1, 4.2 and 4.3 show the responses by the main contractor, subcontractor and architectural firms respectively.



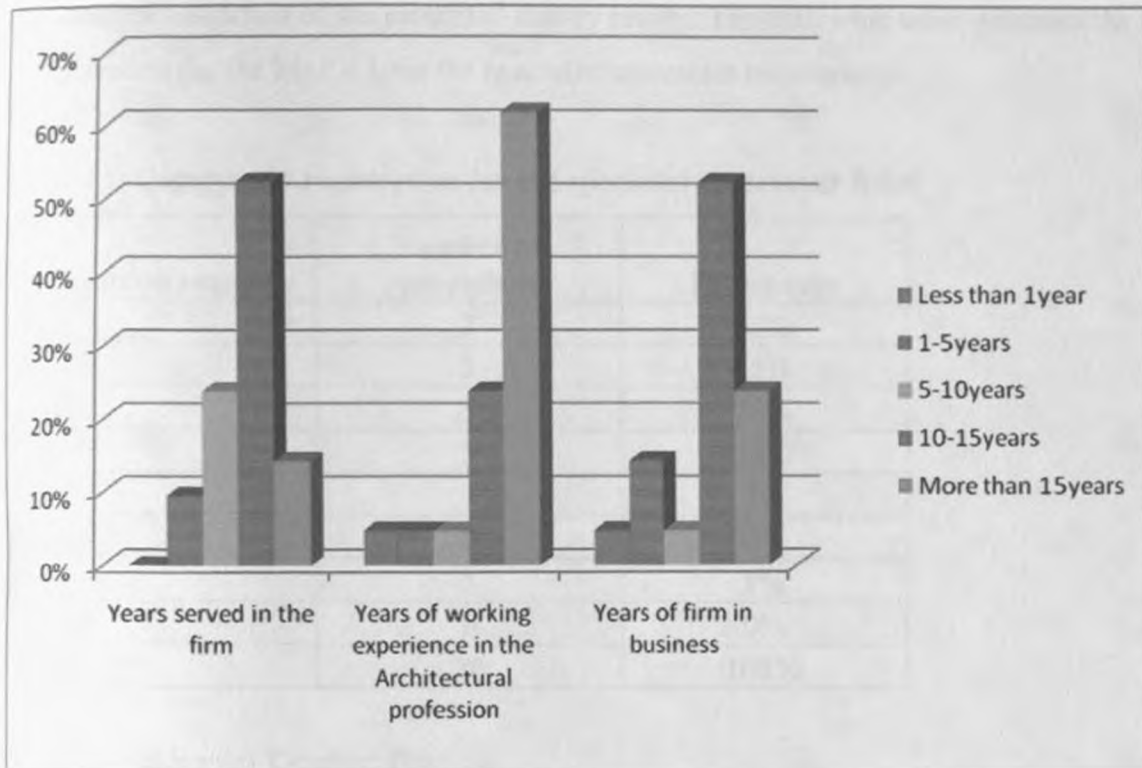
**Figure 4.4: Respondents working experience in the Main Contractor firms**

Source; Field Survey October, 2011



**Figure 4.5: Respondents working experience in the Specialist Contractor firms**

Source; Field Survey October, 2011



**Figure 4.6: Respondents working experience in the Architectural firms**

Source; Field Survey October, 2011

The above figures (4.4, 4.5 and 4.6) clearly show that the respondents had considerable experience (average 15 years) in the construction industry and therefore would answer the questionnaires satisfactorily. The respondent's length of industrial experience coupled with their level of positions in the respective firms, were found sufficient for reliability and validation of the presented survey results.

Besides the individual characteristics of the respondents, the various categories of the firms were also given. The contractor firms registered under Class A in the Ministry of Public Works were (34%), 13% under class B, 13% under class C while 39% under class D. Large scale firms (Class A-D) are likely to embrace subcontracting in their operations. The trend of subcontracting is the same in the construction industry irrespective of the contractor's size. Therefore responses in the study did not vary with the class of contractors. Thus the data captured were found to be



sufficient for validation of the presented survey results. The following table indicates the classes of registration (by the MoPW), for the specialist contractor respondents:

**Table 4.1: Category of registration for the specialist contractor firms**

Registration category	Number of respondents	Percentage
Class A	7	35%
Class B	3	15%
Class C	5	25%
Class D	3	15%
Class E	1	5%
Class F	0	0%
Class G	1	5%
Class H	0	0%
<b>Total</b>	<b>20</b>	<b>100%</b>

Source; Field Survey October, 2011

As seen from table 4.1 above, the specialist contractor's respondents are registered in Class D and above. A small proportion of respondents (5%) are registered under Class E and Class G equally. It is worth noting that contractors operate within the same market, whereas, the size of contractors or class of registration may differ, the principles applied in contracting apply across the board. Therefore, the responses in the study are similar and reliable for validation of the results.

**Table 4.2: Area of specialization for the Specialist contractor firms**

<b>Area of specialisation</b>	<b>Number of respondents</b>	<b>Percentage</b>
Electrical installations	4	20%
Plumbing and Drainage works	5	25%
Joinery works	1	5%
Aluminium works	1	5%
Interior fittings	1	5%
Earthworks	1	5%
Steel works	1	5%
Roofing works	1	5%
Masonry works	1	5%
Structure cabling	1	5%
Air conditioning works	1	5%
Other - Painting works, landscaping works	2	10%
<b>Total</b>	<b>20</b>	<b>100%</b>

Source; Field Survey October, 2011

The above table indicates that the surveyed firms were in different specializations hence this provided a basis for collection of data from different subcontractors handling different type of works.

70% of the surveyed main contractor firms undertake building works only while 30% do both building and civil engineering works. From the responses, the challenges of subcontracting affect both contractors who specialize in building works and those in both building and civil engineering works.

According to responses in the survey, 95% of the surveyed main contractor firms in the building industry indicated that they mainly undertake multi-storey projects whereas only 5% are mostly involved with renovation works. In a construction project, two aspects of complexity can be identified; physical complexity and managerial complexity. Physical complexity refer to the complication arising from design parameters (plans shapes, storey heights etc) while managerial complexity refer to difficulties of coordination and efficiency within the project (Bennet, 1985).

Thus according to this definition, multi-storey buildings are said to be complex and major construction projects involve a complex sequence of interdependent tasks that require different types of specialist workers. With such complexity, the contractor finds himself in a situation where he is not capable of executing some of the works to the best of the client's requirements due to the different categories of skills, size, nature and complexity of the project required for such works hence he sublets those portions of the works to the subcontractors (Kigo, 2009). This makes subcontracting most necessary by the main contractors.

Considering the subcontractors average annual revenues, all have handled projects of between 50-100million Kenyan shillings at one time. The most cited key strengths to handle big projects were: ownership of specialized equipment, technical and managerial skills, industrial experience, good financial standing capital base and the ability to meet deadlines.

97% of the architectural firms frequently undertook projects of more than 20Million in value. Only 3% frequently undertook projects of less than 20Million. Construction projects of high value are in most cases complex in terms of design and the managerial aspect and considering the modern day requirements for comfort, specialization is inevitable in such projects. The architectural firms are therefore familiar with issues of subcontractor management. 95% of the surveyed architectural firms advise Employers to nominate specialist contractors while 5% leave it to the Employer to decide.

#### **4.30 SCOPE OF SUBCONTRACTED WORKS**

Construction projects involve various trades. A great number of different operations are required in construction projects and hundreds of activities can easily be subcontracted. The researcher used a close ended question to investigate the works/trades normally subcontracted by main contractors to the different types of subcontractors.

The survey results were as shown in table 4.3.

**Table 4.3: Trades normally subcontracted by main contractors**

<b>Trade normally subcontracted</b>	<b>Domestic</b>	<b>Nominated</b>	<b>Both</b>
Electrical installations	0%	0%	100%
Plumbing and Drainage installations	0%	0%	100%
Joinery works	12%	74%	13%
Aluminium works	29%	54%	17%
Interior fittings	0%	100%	0%
Lift installations	0%	100%	0%
Earthworks	100%	0%	0%
Steel works	0%	100%	0%
Roofing works	64%	36%	0%
Masonry works	100%	0%	0%
Structured cabling	0%	100%	0%
Art works (murals)	0%	100%	0%
Air conditioning works	0%	100%	0%
Other -Painting, landscaping	56%	44%	0%

Source: Field Survey October, 2011

It emerged that among the trades commonly subcontracted to domestic subcontractors include earthworks, roofing works, masonry works and others such as painting and landscaping. The trades let out to nominated subcontractors are joinery works, aluminium works, interior fittings, lifts installations, steel works, structured cabling, art works (murals) and air conditioning works. The electrical and plumbing works are mainly let out to either domestic or nominated subcontractors.

The results show that subcontractor coordination can have a large influence over the project success in particular and firms increasing the number of subcontractors can have trouble in controlling the coordination process.

The survey indicated that it is a common practice for main contractors to use subcontractors in execution of specific operations in a construction project. 90% of the respondents indicated that they ordinarily subcontract 70-90% of their work to subcontractors while 10% of the respondents indicated that they subcontracted the whole of the works (100%) to be performed by subcontractors.

The results are affirmed by similar research results in USA, UK, Hong Kong, and Brazil where the contribution of subcontractors to the total construction process can account for 80-90% of the total value of the project. This large involvement of subcontractors was attributed to the greater reliance on increasingly complex projects making a contractor not able to execute some of the components.

The main contractors were further asked whether they at one time subcontracted all the trades and undertook management only. 15% of the respondents affirmed while majority of them (85%) have not subcontracted the whole of the works at any given time. Subcontracting the whole of the works is equivalent to subletting. This implied a malpractice by the contractors. Subletting is not allowed unless with the consent of the Employer or the lead consultant.

#### **4.40 REASONS FOR SUBCONTRACTING**

The survey attributed the increased use of subcontractors to the increased complexity of both the construction of buildings and the organizational relationship. The Contractors were asked to rate eight factors which are reasons for subcontracting.

Most factors were highly rated as shown in Table 4.4 below:

**Table 4.4: Reasons for subcontracting, ranking by Main Contractors**

Levels of importance: Very Important =VI(5), Important =I(4), Somewhat Important=SI(3), Less Important =LI(2), Not Important =N(1), TR = Total Response, MR=Mean Rate

Reasons for subcontracting	Levels of Importance to the main contractor					TR	MR	Rank
	VI	I	SI	LI	NI			
	5	4	3	2	1			
Risk management – Most risks in the project are shared. Contractors may attain high profit margin by reducing performance costs. Financial risks are controlled.	87.6%	9.0%	3.4%	0.0%	0.0%	89	4.84	1
Seasonal fluctuating workloads	67.4%	28.1%	4.5%	0.0%	0.0%	89	4.63	2
To access external expertise/technology which contractor may not possess	39.3%	51.7%	3.4%	1.1%	4.5%	89	4.20	3
Financial reasons - Cost cutting strategy, reduced overheads since specialised trades are not required full time hence contractor does not employ workers directly	34.8%	46.1%	7.9%	3.4%	7.9%	89	3.97	4
Increase technical capacity - for specialised services	43.8%	14.6%	36.0%	1.1%	4.5%	89	3.92	5
Access to larger markets including international markets	3.4%	6.7%	62.9%	7.9%	19.1%	89	2.67	6
Increase business opportunities due to increased capacity	12.4%	11.2%	11.2%	0.0%	65.2%	89	2.06	7

Source; Field Survey October, 2011

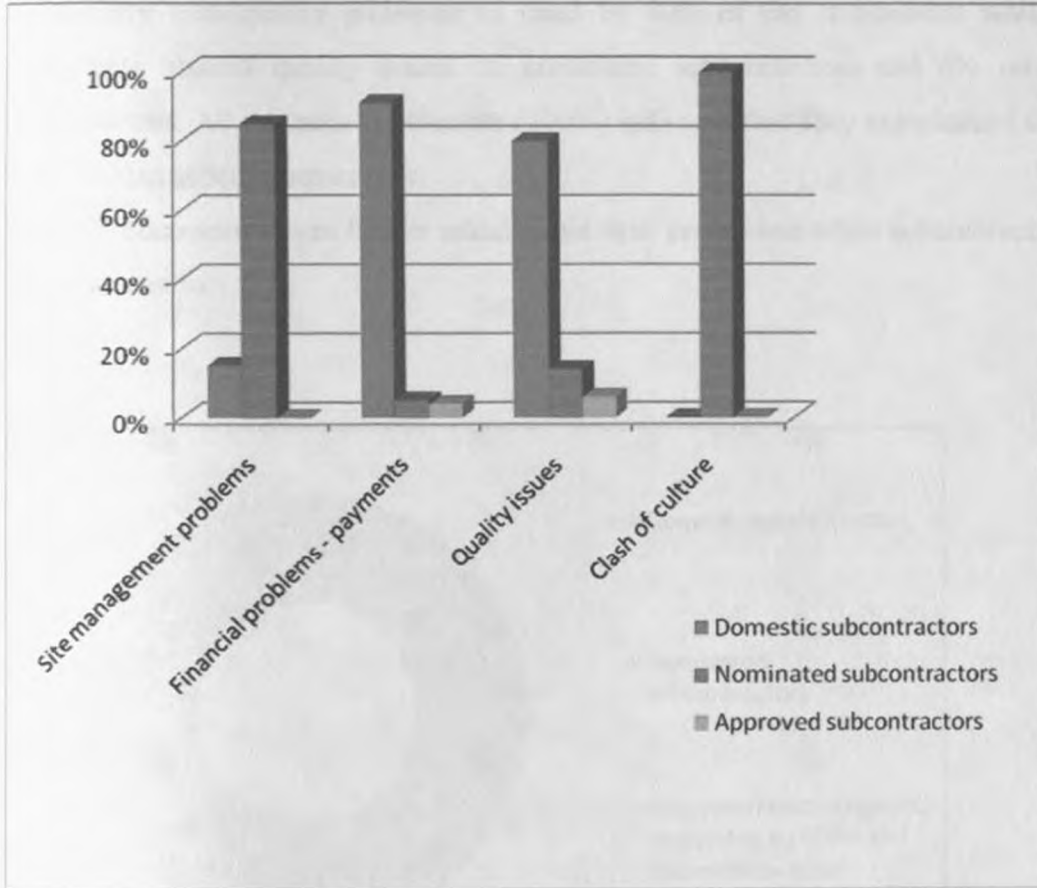
According to table 4.4 above, the main reason contractors subcontract is for risk management. The results give a positive finding of the survey. Druker & White (1995) mentioned that main contractors use subcontractors for two main reasons; down-loading financial risks and off-loading direct employment responsibility. Moreover, subcontractors play a very important role in a construction project as they make up for the lack of manpower, technical know-how, etc. of the main contractor (Pietroforte & Costantino, 2002). From the risk management point of view, subcontracting allows the main contractor to transfer some of the risks and financial burdens of a large project onto other numerous subcontractors' organizations (Pietroforte and Costantino, 2003; Yau 1993). On the other hand, the main contractor relinquishes some degree of control over the work by subcontracting.

In addition, Puttick (1978) and Brooks (1993) have argued that subletting part of work to specialist contractors is not only a useful arrangement for main contractors but also, some of the technical and financial risks are shared between the parties. Subcontractors benefit by obtaining work to sustain their businesses.

## 4.50 PROCUREMENT OF SUBCONTRACTORS

### 4.5.1 TYPES OF SUBCONTRACTORS

The researcher used a closed-end question to determine the experience main contractors' encounter with the different types of subcontractors. The results of the survey were as shown in the figure 4.7 below.



**Figure 4.7: Main Contractor experiences with subcontractors**

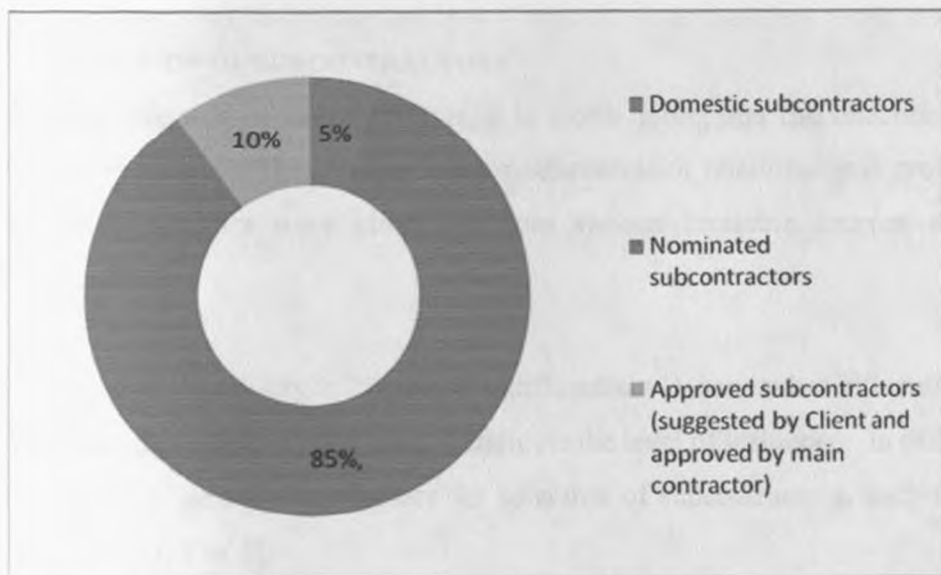
Source; Field Survey October, 2011

85% of the main contractors experienced site management problems with nominated subcontractors and only 15% with the domestic subcontractors. Hsieh (2001) argues that there is difficulty in coordination of construction activity and weak communication between main contractor and nominated subcontractors. This could explain the survey results why contractors

found nominated subcontractors to have problems with site management that includes organization and, coordination of activities on site.

Majority (91%) of the respondents indicated that domestic subcontractors normally have major financial problems and that subsequently affect their performance. Domestic subcontractors are the majority with quality problems as cited by 80% of the respondents while 14% of the respondents blamed quality issues on nominated subcontractors and 6% on the approved subcontractors. All the main contractors (100%) indicated that they experienced clash of culture by nominated subcontractors only.

The main contractors were further asked about their preference while subcontracting. Figure 4.8 shows the results:



**Figure 4.8: Preferred type of subcontractors by Main Contractors**

Source; Field Survey October, 2011

The main reasons for preference of a certain type of subcontractors are as highlighted in table 4.5 below.



**Table 4.5: Reasons for preference of certain type of subcontractors**

Reasons for preference	Domestic subcontractors		Nominated subcontractors		Approved subcontractors	
	Frequency	%	Frequency	%	Frequency	%
Financial capacity	9	10%	76	85%	4	4%
Quality consciousness	3	3%	86	97%	0	0%
Commitment to work	62	70%	7	8%	20	22%
Low bid price	81	91%	2	2%	6	7%
Familiarity with local environment	65	73%	2	2%	22	25%
Safety consciousness	5	6%	6	7%	78	88%
Good site management practices	71	80%	3	3%	15	17%

Source; Field Survey October, 2011

#### 4.5.2 SELECTION OF SUBCONTRACTORS

Regarding selection of subcontractors, it is worth noting that the selection process is important because the nature of the main contractor-subcontractor relationship is project-based. A total of ten selection factors were identified from various literature sources and presented to the respondents.

A five-level scale of very influential (5), influential (4), somewhat influential (3), less influential (2) and not influential (1) was used to indicate the level of influence. In order to rank the relative importance of the selection factors for selection of subcontractors, each response was given a weight (5, 4, 3, 2 or 1).

**Table 4.6: Selection criteria for subcontractors, Architects rating**

Levels of influence: Very Influential =VI(5), Influential =I(4), Somewhat Influential=SI(3), Less Influential =LI(2), Not Influential =N(1),  
TR = Total Response, MR=Mean Rate

Selection criteria for subcontractors	Levels of Importance to the main contractor					TR	MR	Rank
	VI	I	SI	LI	NI			
	5	4	3	2	1			
Past working relationship	57.1%	23.8%	19.0%	0.0%	0.0%	21	4.38	1
Reputation of the subcontractor's firm	23.8%	52.4%	19.0%	4.8%	0.0%	21	3.95	2
Technical capacity	42.9%	14.3%	23.8%	0.0%	19.0%	21	3.62	3
Specialised nature of project works	28.6%	42.9%	9.5%	0.0%	19.0%	21	3.62	4
Bid price	42.9%	4.8%	33.3%	0.0%	19.0%	21	3.52	5
Financial capability	19.0%	23.8%	42.9%	4.8%	9.5%	21	3.38	6
Quality consciousness	19.0%	19.0%	14.3%	23.8%	23.8%	21	2.86	7
Equipment and plant owned	0.0%	42.9%	14.3%	23.8%	19.0%	21	2.81	8
Safety and Health consciousness	0.0%	0.0%	61.9%	19.0%	19.0%	21	2.43	9
Compliance with statutory requirements	9.5%	4.8%	23.8%	28.6%	33.3%	21	2.29	10

Source; Field Survey October, 2011

The ranks and scores of the selection factors by architects are presented in table 4.5. As seen from the table, past working relationship was rated whereas the least considered factor was identified as the subcontractors compliance with statutory requirements..

**Table 4.7: Selection criteria for Domestic subcontractors, Main contractors rating**

Selection Criteria for Domestic subcontractors	Levels of Importance to the main contractor					TR	MR	Rank
	VI	I	SI	LI	NI			
	5	4	3	2	1			
Bid price	87.6%	7.9%	0.0%	0.0%	4.5%	89	4.74	1
Past working relationship	79.8%	6.7%	6.7%	5.6%	0.0%	88	4.63	2
Technical capacity	68.5%	14.6%	5.6%	6.7%	4.5%	89	4.36	3
Reputation of the subcontractor's firm	32.6%	62.9%	3.4%	1.1%	0.0%	89	4.27	4
Specialised nature of project works	38.2%	29.2%	25.8%	2.2%	4.5%	89	3.94	5
Quality consciousness	29.2%	29.2%	13.5%	22.5%	5.6%	89	3.54	6
Financial capability	10.1%	34.8%	46.1%	4.5%	2.2%	87	3.47	7
Equipment and plant owned	12.4%	28.1%	48.3%	6.7%	4.5%	89	3.37	8
Compliance with statutory requirements	3.4%	43.8%	19.1%	25.8%	7.9%	89	3.09	10
Safety and Health consciousness	16.9%	14.6%	28.1%	36.0%	4.5%	89	3.03	9

Source; Field Survey October, 2011

Table 4.7 shows that the top three factors considered important for selection of domestic subcontractors are: bid price, past working relationship and technical capacity with a close range of scores. This can be traced to the trend of the major contractors in the construction industry in selecting the lowest bid regardless of the safety and quality of work.

**Table 4.8: Selection criteria for Approved subcontractors, Main contractors rating**

Selection Criteria for Approved subcontractors	Levels of Importance to the main contractor					TR	MR	Rank
	VI	I	SI	LI	NI			
	5	4	3	2	1			
Past working relationship	40.4%	30.3%	20.2%	9.0%	0.0%	89	4.02	1
Reputation of the subcontractor's firm	21.3%	41.6%	20.2%	16.9%	0.0%	89	3.67	2
Technical capacity	39.3%	19.1%	21.3%	0.0%	20.2%	89	3.57	3
Specialised nature of project works	22.5%	39.3%	18.0%	0.0%	20.2%	89	3.44	4
Bid price	34.8%	16.9%	24.7%	0.0%	23.6%	89	3.39	5
Financial capability	20.2%	21.3%	25.8%	16.9%	15.7%	89	3.13	6
Quality consciousness	20.2%	20.2%	19.1%	21.3%	19.1%	89	3.01	7
Equipment and plant owned	0.0%	25.8%	19.1%	31.5%	23.6%	89	2.47	8
Safety and Health consciousness	0.0%	0.0%	36.0%	40.4%	23.6%	89	2.12	9
Compliance with statutory requirements	6.7%	6.7%	4.5%	50.6%	31.5%	89	2.07	10

Source; Field Survey October, 2011

The above results reveal that in selection of approved subcontractors, the three key factors considered are: past working relationship, reputation of the subcontractors firm and the technical capacity of the subcontractor. This means that contractors are keen on engagement of a subcontractor whom they are conversant with, having good past working records since they could mostly determine their current performance in a project.

Overall, selection criteria are important in the procurement of subcontractors. Massyn (2003) and Haksever, et. al. (1995) have reinforced the view that the selection process of subcontractors is important because the nature of the contractor-subcontractor relationship is project-based and therefore a proper selection and management of the subcontractors should be one of the key issues for contractors who want to maintain good performance and reputation.

Of the 21 surveyed subcontractor firms, 60% preferred to be nominated subcontractors while 35% preferred being domestic subcontractors and 5% preferred to be approved subcontractors. The need for prompt payment was cited by most (86%) of the subcontractors as a reason for their choice of the type of subcontracting. Other identified factors were organisation of the main contractor (6%), form of subcontract agreement used (4%), financial assistance (2%), past working relationship with the contractor (1%) and determination of the subcontract price (1%).

Majority of the subcontractors (76%) indicated that their primary motivation as domestic subcontractors was to build lasting relationship with the main contractors with the hope of getting more work from them in future. 8% stated that getting known in the market was the key consideration while 3% noted making profit and 1% indicated that financial assistance by the main contractor was their prime motivation. Similarly, the subcontractors indicated their primary motivation to work as a nominated subcontractor. Making profit was cited by 95% of the respondents, while 3% and 2% stated getting known in the market and being in business, respectively.

The majority of respondents (75%) stated that they select domestic subcontractors through serial contracting, where they maintain one subcontractor for most of their projects, 16% through single sourcing and 9% through competitive bidding. This explains the earlier result findings where main contractors cited past working relationships as a major factor of consideration in selection of the subcontractors. The main reasons cited by the respondents for use of the various selection methods are: previous working relationships (the main contractor is familiar with the subcontractor), reasonable discounts, lack of time, offers an opportunity to get the most qualified subcontractor at a lesser cost, the process is cheap, there is high quality output and the method saves time.

From the results, it is evident that most contractors prefer serial contracting for subcontractors and single sourcing hence their preference for domestic subcontractors. 75% of the subcontractors indicated that they get work mostly through main contractors, 10% through consultants and 45 directly from the clients. Development of mutual trust between main

contractors and subcontractors creates a continuous and collaborative relationship that enhances better performance in projects.

Previous researches indicated that some of the causes of poor performance emanate from the method of procurement of subcontractors. Inadequate consideration of the procurement process may lead to deployment of incompetent subcontractors who may cause delays, perform poor work and may attract adversarial relationships (Miller, et. al, 2002). Haksever et al, (1995) and Kerfoot (1994) emphasize that the selection process that is based on lower price could lead to the selection of incompetent subcontractors. Consequently, the contractual relationships may begin on a wrong footing, with problems such as unreliability, poor performance, poor working conditions, payments and scheduling (Alman, 1989)

#### **4.60 SUBCONTRACT ARRANGEMENTS BETWEEN MAIN CONTRACTORS AND SUBCONTRACTORS**

Subcontractors are normally key to a successful project delivery, therefore, it is critical that appropriate subcontracts are made, administered, and the main contractor subcontractor relationship well managed. Regarding the contract type between main contractors and domestic subcontractors, the results of the study revealed that most main contractors (87%) mainly used custom-made subcontracts while 13% used the JBC/KABCEC contract. The use of custom-made contract is to ensure that the conditions of the contract are tailor-made to suit the parties to the contract. This ensures no restrictions are imposed on the contract that may pose challenges in execution of the contract. All the respondents (main contractors) indicated that they were once engaged as nominated subcontractors and a standard contract was applied.

Majority of the of the architect's respondents (80%) indicated that they mostly specified the use of JBC/KABCEC contract since it is a standardized document which is easy to read and understand. 5% specified FIDIC due to the reasons that they are universal and can be applied across the world while 15% suggested the use of custom-made subcontracts noting that these were tailor-made to suit the nature of relationship depending on the works under execution. It made it easy for the parties to the subcontract to deliberate and customize certain aspects to suit

their working relationship. No architectural firm cited that they suggested verbal subcontract s between main contractors and nominated subcontractors.

The main contractors indicated that the most preferred information given to domestic subcontractors was provision of both the bills of quantities and drawings. This shows that the subcontractors are normally provided with the appropriate information for tendering or are aware of details of a project before getting into a contractual relationship with the main contractor.

Standard contracts allow contractors to sublet portions of the work to firms of their own choice provided that contractual conditions are met (Smith, 1995). This is the opportunity for contractors and subcontractors to negotiate risks in the project.

Smith (1995) observed that contract agreements between main contractors and domestic subcontractors in many cases, are a matter of total privacy. There are no well developed procedures for selecting domestic subcontracts (Talukhaba & Mapata, 2007).

Most contractors (76%) cited that domestic subcontracts are not in writing. In such cases important aspects of the contract such as workmanship standards, co-ordination and payment would be undermined if not based on strong contractual foundations and may inevitably breed conflicts (Puttick, 1978).

#### 4.70 CONTRACTUAL AND OPERATIONAL CHALLENGES

The Architectural firms rated the performance of subcontractors with regard to the main contractor-subcontractor relationships as follows;

	subcontractors	subcontractors
	50%	43%
	25%	17%
	13%	33%
	7%	10%
	5%	7%
	5%	15%
	100%	100%

**Table 4.9: Performance of subcontractors, rating by Architectural firms**

Factors on performance of subcontractors	Domestic subcontractors			Nominated subcontractors		
	Low	Medium	High	Low	Medium	High
Firms organization structure	76%	24%	0%	5%	24%	71%
Communication with main contractor	0%	43%	57%	43%	0%	57%
Inter-organizational conflicts between main contractor and sub-contractors	90%	10%	0%	0%	0%	100%
Financial capacity of subcontractors	62%	33%	5%	5%	48%	48%
Cooperation between main contractors and subcontractors	10%	24%	67%	48%	43%	10%
Coordination between main contractors and subcontractors	14%	76%	10%	5%	10%	86%
Work performance on site	0%	10%	90%	24%	48%	29%
Working relationship with main contractor	0%	5%	95%	62%	24%	14%
Site management	29%	67%	5%	29%	62%	10%
Attitude to claims	52%	24%	24%	19%	10%	71%
Adherence to cost estimate	14%	43%	43%	14%	43%	43%
Industry awareness	76%	14%	10%	14%	24%	62%
Commitment to work	0%	5%	95%	5%	81%	14%

Source; Field Survey October, 2011

The research further investigated the kind of complaints the Architectural firms received from sub-contractors regarding the main contractor. Table 4.10 illustrates the responses:

**Table 4.10: Complaints by subcontractors about Main contractors**

Complaints	Nominated subcontractors	Domestic subcontractors	Approved subcontractors
Non-payment	4%	68%	49%
Attendance issues	59%	2%	19%
Extension of time	21%	13%	5%
Provision of insurance	9%	5%	10%
Work programmes	3%	9%	7%
Others	4%	3%	10%
Total	100%	100%	100%

Source; Field Survey October, 2011

The findings in table 4.10 indicate that 68% of the respondents found non-payment complaints to be frequent with domestic subcontractors; only 49% associated the problem with approved subcontractors and 4% with nominated subcontractors. The complaint on attendance issues by main contractors was common with nominated subcontractors as cited by 59% of the respondents, 19% felt it was with approved subcontractors and only 2% felt it was a problem among the domestic subcontractors. From the results, it can be found that non-payment is common with contractors and this imposes financial challenges to the subcontractors. The subcontractors delay in completion of their sections of work ultimately delays the whole project.

**Table 4.11: Complaints by Main contractors about Subcontractors**

<b>Complaints</b>	<b>Nominated subcontractors</b>	<b>Domestic subcontractors</b>	<b>Approved subcontractors</b>
Non adherence to work programme - delays in work progress	48%	22%	49%
Non provision of Insurance and indemnity	35%	56%	20%
Lack of coordination in execution of works	11%	6%	10%
Competence of the subcontractor	2%	13%	13%
Others	4%	3%	8%
Total	100%	100%	100%

Source; Field Survey October, 2011

As seen in table 4.11, 48% of the respondents complained that non-adherence to work programmes was common with nominated subcontractors, 22% noted it was with domestic subcontractors while 49% cited approved subcontractors. Other complaints touching on subcontractors included; entitlement of time extension by subcontractors, delays by subcontractors, rights and remedies and liquidated damages. All these factors impact negatively on performance of the construction project.

The research further sought to identify ways in which architects solved problems faced by both the subcontractors and the main contractors. The following were the responses given by the architectural firms:



- i) On non-payment issues – The Architects advise clients to pay subcontractors directly and also make timely payments. They encourage that subcontract agreements include and clearly stipulate the payment terms for the subcontractors especially where they are to be paid through the main contractors.
- ii) On attendance issues –The Architects encourage both parties (main contractor and subcontractor) to agree before hand on what attendance should be provided and the charges for it. They require that the subcontract agreement clearly indicate the parties responsibility on provision of attendance on site.
- iii) Extension of time – The Architects demand adherence to the work programme and submission of regular updates on progress. Regular coordination meetings between main contractors and the subcontractor’s would also help a great way in ensuring timely delivery of the project.
- iv) Submission and implementation of work programmes – The Architects impress on the involvement of subcontractors when the main contractor is drawing up work programs. This would assist in giving realist dates and more so enhance proper coordination of the activities on site.
- v) Competences of subcontractor – The Architects advise clients and main contractors to embrace suitable methods of procurement of subcontractors depending on the type of the project. If a specialized project, then nominated subcontractors would be suitably nominated through competitive bidding. This way the client is likely to obtain a competent subcontractor who has both technological and financial capacity to handle the works in addition to getting competitive price for the works.

The architectural firms were further asked to state reasons as to why they preferred using the following types of subcontractors in a project and the responses were stated as:

- i) Nominated subcontractors –Competitiveness in tendering was indicated by 87% of the respondents, quality conscious (80%), speed in delivery of projects (45%), possessions of specialized skills (76%).
- ii) Domestic subcontractors - Ease of coordination and cooperation was indicated by 45% of the respondents, enhances speedy work since their engagement lies solely with the main

contractor (81%), cooperativeness and loyalty to the main contractor hence reducing management problems (90%).

- i) Approved subcontractors - Complexity of projects was cited by 61% of the respondents, provision of specialized skills (30%), coordination and cooperation (26%) and quality consciousness (31%).

The following were stated as the problems/challenges faced by each of the following type of subcontractors:

- i) Nominated subcontractors - Financial challenges (61%), inadequate technical capacity (61%) may be due to lack of due diligence by the appointing authority (Employer or lead consultant), delayed completion of works (4%).
- ii) Domestic subcontractors - Financial challenges (73%), lack of commitment to work (60%), no specialization (41%), delays in work progress (37%), lack of technical capacity/competence resulting to poor performance (21%), non consciousness on quality work (8%), site management problems (8%).
- iii) Approved subcontractors - Delays in work completion (43%).

The architectural firms were required to give their opinion on the best subcontract type for use in a building project and state reasons for the preference. 57% stated nominated subcontractors as the best for use in projects because; there's independence in the organizational set up. 42% noted that work specialization is enhanced hence better quality work and usually their commitment to work is higher than for the rest. 3% of the respondents indicated that the most preferred was domestic subcontractors since they are appointed by the main contractor hence past working relationships enhance cooperation and coordination on site 2% of the respondents indicated approved subcontractors as the most preferred since they would be preferred by both client and the main contractor.

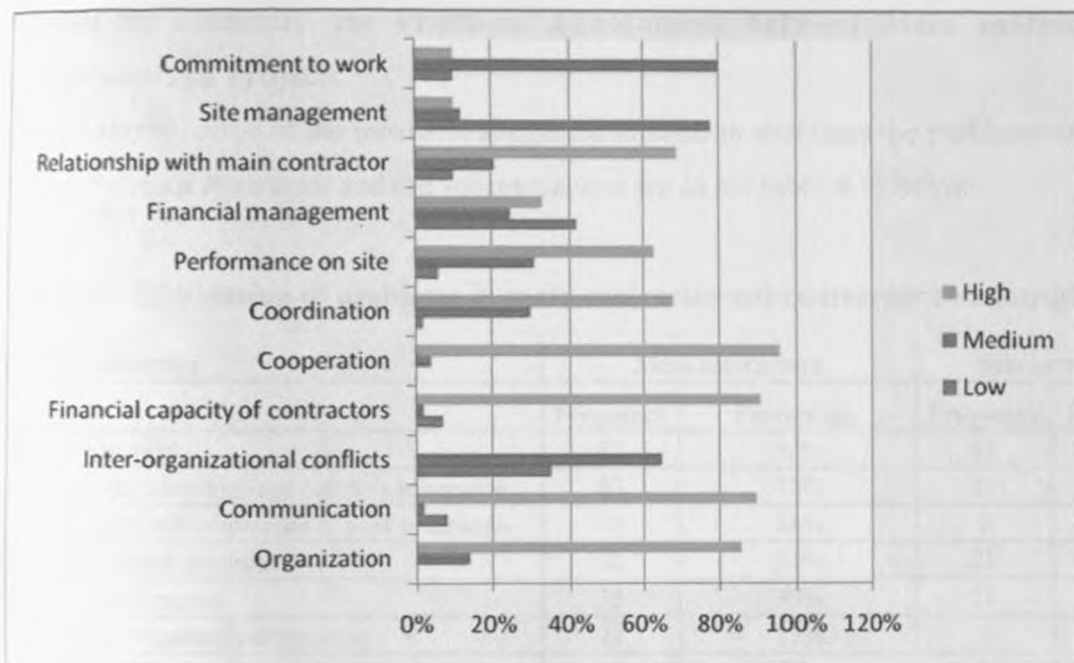
The surveyed subcontractor firms stated that they solved problems with the main contractors through consultative meetings as this allows them to deliberate on pertinent issues that may otherwise cause conflict in their operations. This involves dialogue between the parties.

Reference to the contract, mediation by the architect, arbitration and the court of law were cited as other ways they solved their problems.

The research further examined the involvement of subcontractors in drawing up work programme. 93% of the surveyed subcontractor firms stated that they are not involved while 7% are involved. This is an aspect that would create conflicts during implementation of the programme of works in the course of implementation of the project thus affecting performance of both parties. The subcontractor firms were further asked to state whether they subcontracted any works. All the respondents indicated that they do subcontract. This clearly shows the multi-tier of subcontracts and the need/importance of getting the relationships in the supply chain for improved performance in projects.

#### **4.80 ENHANCING EFFECTIVE RELATIONSHIPS BETWEEN MAIN CONTRACTOR AND SUBCONTRACTORS**

The architectural firms respondents were asked to give recommendations that can be used in subcontracting to improve the relationship between main contractors and subcontractors. 46% indicated that partnering of main contractors and subcontractors would improve their relationship as well as the performance, 41% cited that regular consultative meetings between the parties are necessary, direct payments to subcontractors (8%) while 5% indicated that attendance to subcontractor should be duly provided.



**Figure 4.9: Factors affecting main contractor-subcontractor relationships**

Source; Field Survey October, 2011

The figure above shows that organization of a firm is a factor affecting main-contractor subcontractor relationship and has high effect on performance of construction projects as indicated by 83% of the respondents while 17% indicated that it has medium effect.

Communication was cited by 90% of the respondents as having high effect on performance while 8% felt it had low effect and 2% felt it had medium effect. Regarding the communication process between main contractors and subcontractors, 50% of respondents indicated that informal, face to face communication was the main means of communication. The results indicated that 33% of respondents communicate with subcontractors by telephone. Only 6% of the respondents have mentioned that they have formal communication (using letters) with subcontractors. This result reflects the informal characteristics relationship between general contractors and subcontractors. This type of relationship (little documentation) can be a source of problems which may affect the progress and the quality of the work.

## Measures to Eliminate the Problems Encountered between Main contractors and Subcontractors on Projects

From the survey, some of the measures suggested in order to eliminate the problems encountered between the main contractor and the subcontractors are as per table 4.13 below:

**Table 4.12: Elimination of problems in main contractor-subcontractor relationships**

Suggested measures	Main contractors		Subcontractors	
	Frequency	Percentage	Frequency	Percentage
Prompt payments	82	92%	16	76%
Clear tender documentation and complete information	65	73%	11	52%
Involving all parties in preparation of work programme	75	84%	9	43%
Holding consultative meetings	81	91%	21	100%
Commitment to contract	35	39%	11	52%
Using competitive methods of tendering	12	13%	3	14%
Allow adequate time for preparation of tenders	6	7%	5	24%
Effective communication	69	78%	17	81%
Financial stability of a firm	9	10%	9	43%

Source; Field Survey October, 2011

### 4.90 SUMMARY OF THE DATA PRESENTATION AND ANALYSIS

The foregoing chapter has presented and analysed all data collected from the field in which questionnaires were filled by the various respondents. In analysis of the data, the researcher was able to accomplish the study objectives. The general characteristics of the population in terms of the respondents background information was gathered, the years of service in the firm as well as the working experience in the construction industry. The firms area of specialisation was also noted. The scope of subcontracted works, the common trades in a construction project and the level of subcontracting by the main contractors was established.

The main contractors identified their reasons for subcontracting and their preferred choice of subcontractors. The procurement of subcontractors and subcontract management were also addressed in the questionnaires so information on the same was gathered from the respondents.

Finally, the contractual and operational challenges faced by both the main contractors and subcontractors were analysed. The respondents suggested ways of enhancing effective contractor-subcontractor relationship for improved project performance. In the next chapter, a summary of findings gathered from the data analysis is presented.

#### SUMMARY OF RESEARCH FINDINGS

This chapter discusses the working and contractual relationship between Main Contractors and Subcontractors. The main contractors, sub-contractors and activities perspective and how it affects performance. The contracting is a primary feature of the Egyptian economy and it is a major source for companies to expand subcontractors. The main of the study is to identify the main reasons for contract failure. This study is a general relationship between contractors and main contractors. In this chapter the researcher presents a summary of the contractual and operational challenges faced by both the main and subcontractors of the study.

#### Contractual Issues

It is generally believed that 75-80 percent of the work is performed by subcontractors. This study revealed that most of the main contractors' subcontractors are involved in various activities including: paving, masonry work, and other work of general nature. The main contractors' subcontractors are mainly small companies. Among the subcontractors, small firms, unlicensed building, and water supply and sewerage, the electrical and plumbing work are common. It is also a clear domestic subcontractors. Some of the main contractors' subcontractors are small and unlicensed firms.

#### Operational Challenges

Contracted the main contractors, it is a common practice to use subcontractors in a construction project. There are many reasons for the failure of the subcontractors. It is common to have delays, quality of finished work, and reduced work progress on the part of subcontractors. Monitoring and controlling, quality control, cost and time management, problems in contractual aspects because of the main contractors. Other reasons revealed by the study of reasons for the failure of subcontractors are: lack of technical capacity, lack of necessary resources

# CHAPTER FIVE: FINDINGS, CONCLUSION AND RECOMMENDATIONS

## 5.10: SUMMARY OF RESEARCH FINDINGS

This study has explored the working and contractual relationship between Main contractors and subcontractors from the main contractors, subcontractors and architects perspective and how it affects project performance. Subcontracting is a prevalent feature of the Kenyan construction industry where it is quite common for contractors to engage subcontractors for most of the trades, especially those which require special skills. There exists a mutual relationship between the subcontractors and the main contractors. In this chapter the researcher provides a summary of the findings, the conclusions made from the study and finally recommendations of the study.

### *Scope of subcontracted works*

The results of the study indicated that 70- 90 percent of the work is performed by subcontractors. The study further revealed that most of the trades commonly subcontracted to domestic subcontractors include earthworks, roofing works, masonry works and others such as painting and landscaping. The trades let out to nominated subcontractors are joinery works, aluminium works, interior fittings, lifts installations, steel works, structured cabling, art works (murals) and air conditioning works. The electrical and plumbing works are mainly let out to either domestic or nominated subcontractors. Some of the main contractors (10%) usually subcontract all work and undertake management only.

### *Specific reasons for subcontracting*

The study established that for main contractors, it is a common practice to use subcontractors to execute specific operations in a construction project. There are many benefits to be gained from working with subcontractors. It provides skilled labour, reduced overhead costs, and reduced work and financial pressure on the main contractors. Monitoring and controlling, quality control, safety management and labor management problems on construction projects become less complicated for main contractors. Other reasons revealed in the study as reasons why main contractors engage subcontractors are: lack of in-house capacity, need for accessing external

expertise/technology, financial reasons (e.g. cost-cutting strategies) or, other reasons (e.g. access to geographical areas with growth prospects).

Subcontractors play a very important role in a construction project as they make up for the inadequacy of specific skills.

### ***Procurement of subcontractors***

Since most of the work in a construction project is handled by subcontractors, subcontractor selection is very important for project success. The selection of subcontractors can be made by the main contractor (domestic contract), by the client (nominated contract) (Shoosmith, 1996) or jointly by both parties (approved) in collaboration (Eriksson, 2007). Main contractors indicated that they select subcontractors according to the complexity of the work and previous experience with subcontractors. The commonly used method of procurement by the main contractors is through serial contracting.

Most main contractors (85%) experienced site management problems with nominated subcontractors. Domestic subcontractors were cited by majority of the main contractors (91%) as having financial problems. In terms of preference of the type of subcontractors, 85% of the main contractors indicated that nominated subcontractors were highly preferred due to their financial capacity and 97% cited their quality consciousness. 70% and 90% indicated their preference for domestic subcontractors as due to their commitment to work and low bid price respectively. Approved subcontractors were preferred for their quality consciousness as indicated by 88% of the main contractors. The three key factors considered important during selection of domestic subcontractors are bid price, past working relationship and technological capacity with the mean rate of 4.74, 4.63 and 4.36 respectively.

The three main factors in selection of subcontractors, as cited by the Architectural firms were; past working relationships (4.38), reputation of the subcontractor firm (3.95) and technological capacity (3.62). 76% of the subcontractors stated that their prime motivation to work as domestic subcontractors was to build lasting relationships with the main contractor with hope of getting future jobs with them. 95% stated their motivation to work as nominated subcontractors was to



make profit. The objective of subcontractors in a construction project would highly determine their way of operation or performance as well as their relation with the main contractor.

#### ***Subcontract Arrangements between main contractors and subcontractors***

Majority (87%) of main contractors use custom-made subcontracts with domestic subcontractors and standard contracts (like JBC) while working with nominated subcontractors. Most Architects (80%) mainly specified the use of JBC/KABCEC contract between main contractors and subcontractors since it is standardized document which is comprehensive and easy to read and understand. All the main contractors indicated that they provided the domestic subcontractors with drawings and bills of quantities for provision of quotations.

#### ***Contractual and operational challenges both main contractors and subcontractors***

Based on the findings from the study the following major problems and challenges were identified with the subcontractors:

- a) Non-adherence to work programmes – Approved subcontractors (49%), nominated subcontractors (48%) and domestic subcontractors (22%)
- b) Non-provision of insurance and indemnity - domestic subcontractors (76%), Approved subcontractors (49%), nominated subcontractors (4%) and
- c) Lack of coordination in work execution
- d) Delays by subcontractors
- e) Lack of subcontractor competence

The following were the main complaints by subcontractors about the main contractors:

- a) Non-payment
- b) Non-provision of attendance
- c) Unrealistic work programmes

## 5.20 CONCLUSIONS

In this chapter, the researcher provides a summary of the findings of the study as was analysed from the data collected. From the findings of the study, conclusions are drawn relating to main contractor-subcontractor relationships and their effect on performance of construction projects.

The study focused on the following objectives: reasons for subcontracting, the scope of subcontracting by main contractors, procurement of subcontractors and the contract arrangements between main contractors and subcontractors. The study further examined the contractual and operational challenges faced by both main contractors and subcontractors in a project. Finally, recommendations were made on suitable ways of enhancing effective relationships between main contractors and subcontractors for improved project performance.

Based on findings of the study, the researcher concludes that subcontracting is a much embraced practice by main contractors due to the following reasons, in order of importance (from most important to the least important)

- i) Risk management – Contractors mainly control financial risks through engagement of subcontractors who also assist in financing of the project.
- ii) Construction projects are seasonal. Once the project is completed, a contractor may stay for a while without having another project therefore due to the uncertainty or unpredictability of when another project comes up, main contractors prefer to subcontract the works to those who may have the capacity to handle it instead of having employees.
- iii) The need to access external expertise or technology which a contractor may not possess.
- iv) For financial reasons – Subcontracting serve as a cost cutting strategy, it is seen to reduce overheads since specialized trades are not required full time hence contractor does not employ workers directly.
- v) Increase technical capacity due to provision of specialized services
- vi) Access to larger markets including international markets
- vii) Increase business opportunities due to increased capacity.

The study revealed that most contractors subcontract 70-90% of their works to subcontractors in a project. The large involvement of subcontractors was attributed to the increase of complex

buildings which have specialized requirements. The main contractors are left to undertake management only. Most contractors prefer nominated subcontractors for specialized works. Most Architects advise the Employers to nominate specialist subcontractors. Most clients may not be informed on the engagement of subcontractors or the vetting process therefore the architect in most cases being the lead consultant, is charged with the responsibility to having one on site. In conclusion, all the study objectives were achieved.

### 5.30 THE STUDY OF HYPOTHESES

The research question posed in this study was designed to understand the experiences related to subcontracting in the Kenyan construction industry and how that relates to performance of the players. The null hypotheses ( $H_0$ ) and alternate hypotheses ( $H_A$ ) that guided the study were presented as:

$H_0$  Contractor-subcontractor relationship has no effect on the performance in construction projects

$H_A$  Contractor-subcontractor relationship affects the performance in construction projects

The research established a relationship between contractors and subcontractors. It was revealed by the survey results that 100% of the contractors subcontracted out works at one time. This evidently shows that subcontracting is an inevitable tool of contracting by main contractors and that a large portion of the works (70-90%) is subcontracted. The study further established that as some of the main contractors undertake management role, the actual implementation of the works is mainly performed by the subcontractors.

The engagement of the subcontractor is key in ensuring that the best are selected for the works. Poor relationships between the main contractor and subcontractor can lead to frustration of the contract leading to non performance. In this regard therefore, it is proven that relationships between the main contractor and subcontractors greatly affect the performance of construction projects. Poor working and/or contractual relationship result to poor performance of projects in way of delay in completion, non-adherence of the project budget and poor quality product. Therefore, the hypothesis of the study was disapproved and rejected hence accepting the  $H_A$

(Alternative hypothesis) that Contractor-subcontractor relationship affects the performance in construction projects.

## 5.50 RECOMMENDATIONS

Cooperative relationships between client and main contractor do not automatically spread to subcontractors, which are often traditionally procured by main contractors. Hence, clients who wish to integrate subcontractors in teamwork and joint problem-solving have to get involved in the procurement of subcontractors. Careful joint subcontractor selection by both client and main contractor in collaboration is therefore important in order to increase subcontractors' involvement and cooperation which in turn may have many positive effects on project performance. Earlier research found that increased subcontractor involvement may facilitate improved economical performance, time performance and quality (Erasti, 2007). Hsieh (1998) found the main missing element in the construction process is the disregard of the crucial role played by subcontractors who are hired to perform specific tasks on a project. This results in main contractors concentrating their efforts on managing site operation rather than employing direct labor to undertake construction work.

For the improvement of the contractors-subcontractors relationship, the following recommendations are suggested to the contractors and subcontractors to improve their relationships:

- i. Main contractors should embrace selection criteria that facilitate a competitive contracting process, which requires projects to be awarded to the subcontractor offering the best combination of price and other qualifications. Subcontractor should give considerations in selection of main contractor based on the reputation as well as business competency of the contractor company.
- ii. The most significant recommendation is for integrating subcontractors into partnering approach. Partnering aims to reduce the adversarial relationships which is said to be typical in the industry and which has confounded previous attempts to encourage better integration and cooperation between contractual partners. Construction partnering would mean a

commitment between the parties (contractor and subcontractor) to improve communications and avoid disputes by working together towards shared and common goals and objectives on a project specific basis. This established need for main contractor-subcontractor partnering must therefore be incorporated in the subcontractor selection criteria and reflected in the selection process itself. It is also consistent with the general philosophy of partnering, in integrating all key participants and inculcating a common sense of project purpose, commitment, teamwork, and problem-solving.

iii. It is imperative to improve and develop the subcontractors position towards the general contractor, by upgrading the understanding of all contract terms such as; wording and potential for negotiations of conditions including indemnity, payment and retention terms, warranties and call backs, schedule of work, delays and liquidated damages and of course the scope of work.

Other recommendations include:

- a) Providing subcontractors with complete and effective information and drawings from contractor and getting prompt payment from contractor. Problem solving or compromising attitude towards negotiation bring its efficiency. However, forcing attitude of contractor generate adversarial relationship as well as develop conflict between the parties.
- b) All subcontractors should be selected using some criteria which should emphasize equality, expertise, and commitment to perform. This would enable risks to be shared objectively with the consequence of better project performance. When the contractor is rating subcontractors, account should be made for the ability of the subcontractor to meet the following criteria: produce project schedules, produce quality work, employ skilled trades people, cultivate goodwill between parties and the ability to allocate resources. The method of selection of subcontractor's would be well thought in order to obtain a subcontractor who can perform.
- c) Main contractors should always embrace the best practice for selection of subcontractors.
- d) Coordination and consultative meetings between main contractors and subcontractors is of utmost importance in ensuring effective relationships for better performance of the project.
- e) Communication is of paramount importance to an effective relationship between main contractors and subcontractors and this should be maintained in all contracts.

- f) Formal and recognizable contract bodies should be used where they are available.
- g) There should be commitment to teamwork from both the main contractors and subcontractors.

**5.60 RECOMMENDATIONS FOR FUTURE RESEARCH**

1. There exist many criteria evaluation methods for subcontractor selection systems. However, the focus of the application was on selection of subcontractors from the perspective of the Architects and the main contractors. The study of Employers criteria of selection of subcontractors is recommended.
2. This study only focused on the relationship between main contractors and subcontractors but other relationships also exist in the construction projects; the relationships between Consultants and Contractors, Employer and Contractors. Therefore, this study recommends further research on the other relationships.

## REFERENCES AND BIBLIOGRAPHY

- Arditi, D & Chotibhongs, R 2005, 'Issues in subcontracting practice', *Journal of Construction Engineering and Management*, ASCE, Vol. 131, No. 8.
- Babbie, E 2007, 'The practice of social research', 11th edn, Belmont: Wadsworth Publishing.
- Beardsworth, A 1988, 'Management, Transience and Subcontracting the Cases of the Construction Site', *Journal of Management Studies*, Vol. 25, No. 6, pp. 603-263.
- Bennett, J 1991, *International construction project management: general theory and practice*, Butterworth-Heinemann, Oxford.
- Bennet, J 1985, *Construction project management*, Butterworths, London.
- Bennett, J & Ferry, D 1990 'Specialists contractors', *A Review of Issues Raised by their New Role in Building Construction Management and Economics*, Vol. 8, 259-263.
- Bennett, J & Grice, T 1990 'Procurement systems for building', *Quantity Surveying Techniques*, Blackwell Scientific Publications, London.
- Berry, A 1997 'SME Competitiveness', *The Power of Networking and Subcontracting*, Inter-American Development Bank, Washington, D.C.
- Bresnen, M & Marshall, N 2000a, 'Partnering in Construction: A Critical Review of Issues, Problems and Dilemmas'. *Construction Management and Economics*, 18 (2).
- Brook, M 1993 '*Estimating and tendering for construction work*', Oxford, Butterworth Heinemann.
- Chung, SY & Ng, ST 2006, *The practice of subcontractor appraisal in the construction industry of Hong Kong*, CIB W107 Construction in Developing Countries, Santiago, Chile.
- Clough A, Richard H & Sears A 1994, *Construction contracting*, 6<sup>th</sup> edn, John Wiley & Sons, Inc. Newyork, USA.
- Coase, R 1937 '*The nature of the firm in economics 4*', pp. 386-405.

- Crosthwaite, D 2000 'The global construction market: a cross sectional analysis', *Construction Management and Economics*, Vol 18, 619-627.
- Dainty, A, Briscoe, GH & Millett, SJ 2001 'Subcontractor perspectives on supply chain alliances', *Construction Management and Economics* 19, pp. 841-848.
- David, V 2003, *Research Design in Social Research*, Sage Publications London, Thousands Oaks; New Delhi India.
- Deardorff, A.V, & Djankov S 2000, Knowledge Transfer under Subcontracting: *Evidence from Czech Firms in World Development*
- Edum-Fotwe, F.T, McCaffer R, Thorpe A, & Abd Majid Z.M 1999, Proceedings of the 2nd International Conference on Construction Industry Development, CIB: *sub-contracting or Co-contracting: Construction Procurement in Perspective*, TG 29, National University of Singapore, October 1999.
- Eccles, R G 1981, 'The quasi-firm in the construction industry', *Journal of Economic Behaviour and Organization*, EUA North Holland.
- Errasti, A 2007, A process for developing partnerships with subcontractors in the construction industry: An empirical study, *International Journal of Project Management*, Volume 25, Issue 3.
- Floyd J 1993, *Survey research methods (rev.)*, Sage Publications Beverley Hill London.
- Franks, J 1998, *Building subcontract management*, 1<sup>st</sup> edn, Macmillan U.S.A Ltd.
- Gichuhi, F 2010, 'Collapsed building at Kiambu', *Daily Nation*, 21 October.
- Gidado, K 1996, 'Project complexity: the focal point of construction production planning', *Journal of Construction Management and Economics*. 14, pp. 213-225.
- Gubik A 2005, 'New Opportunities for SMEs founded by Co-operation in: *European Integration Studies*, Vol. 4. No. 1, viewed 21 March 2012, <http://www.uni-miskolc.hu/uni/res/kozlemenyek/2005/pdf/gubik.doc>.



Guidelines for a successful construction project, 2008, the Associated General Contractors of America/American subcontractors Association Inc./Associated specialty contractors.

Gray C & Flaganan, R 1989, *The changing role of specialist and trade subcontractor*, Chartered Institute of Building, Ascot, UK.

Haksever, A, Kim, HS & Pickering, G. 1995, *Collaborative long term relationships in UK construction industry; A lost opportunity*, 11<sup>th</sup> ARCOM conference, University of Newyork and York, UK.

Hillebrandt, P 1985, *Economic theory and the construction industry*, 2nd Edn. Macmillan, London.

Hinze, J & Tracy, A 1994, 'The contractor-subcontractor relationships: relationships: the subcontractor's view', *Journal of Construction Engineering and Management*, ASCE, Vol. 120.

Holton, E. H. & Burnett, M. B 1997, 'Qualitative research methods in R.A Swanson & E.F

Hsieh, TY 1998, 'Impact of subcontracting on site productivity, lessons learned in Taiwan', *Journal of construction Engineering and Management*, ASCE 124 (2).

Joint Building Council 1999, Agreement and schedule of contract for building works, Nairobi, Kenya.

Kale, S & Arditi, D 2001, 'General contractors relationships with subcontractors: A strategic asset', *Construction management and Economics*, Vol. 19 No.5 P.541-50.

Kerfoot, A 1994,'Problems affecting subcontractor performance in the South African building industry', Unpublished dissertation, University of the Witswaterand.

Kigo, PW 2007, 'A study into the effects of selection and management of the nominated subcontractors on construction projects performance', unpublished undergraduate research project, Department of Real Estate and Construction Management, University of Nairobi.

Kumaraswamy, M & Mathews JD 2000, 'Improved subcontractor selection employing partnering principles' *Journal of Management in Engineering*, Vol. 16, No. 3, pp.47-56.

Kwakye, A 1997, *Construction project administration in practice*. Longman, London.

Latham, M 1994, *Constructing the Team*, Final report of the government/industry review of procurement and contractual arrangements in the UK construction industry, HMSO, London.

Leedy, D 1985, *Practical Research Planning and Design*. Macmillan Publishing Co. Newyork.

Leedy, P, Ormrod D & Jeane E 2001, 'Practical research planning and design (7<sup>th</sup> ed.) Merill Prentice-Hall, Ohio (U.S.A)

Lehtonen WT (ed) 1998, 'Improving subcontracting of the construction industry by participatory cooperation, *Human Factors in Organizational Design and Management – VI*, Elsevier Science, Netherlands.

Likert A 1932, 'A technique for measurement of Altitudes as cited by Floyd J.F (1993).

Love, P, Skitmore, M & Earl, G 1998, 'Selecting a Suitable Procurement Method for a Building Project'. *Construction Management and Economics*, 16 (2).

Mansfield B 1988, Proceedings of the 1988 Subcontractor's conference: Subcontractors at a threshold: Lifting your game and your bottom line, Sydney.

Massyn, M.W 2003, Refereed proceedings of the 2003 1<sup>st</sup> postgraduate conference of the CIDB on Construction Industry Development: *The role of subcontracting organization on the business process of contractors, South African perspective*, Port Elizabeth, pp.237-240

Masterman, J 1992, *An Introduction to building procurement systems*, E. & F.N Spon, London.

Masu, SM 2006, 'An investigation into the causes and impact of resource mix practice in the performance of construction firms in Kenya: A case study of building construction firms in Nairobi', unpublished PhD Thesis, University of Nairobi.

Mbatha, CM 1986, 'Building contracts performance: A case study of government projects in Kenya', unpublished M.A Project, University of Nairobi.

Miller, C & Thomas, B 2002, 'Harmonization between main contractors and subcontractors: prerequisite for lean construction', *Journal of Construction Research*, Vol.3, No.1, pp67-82.

- Ministry of Public Works 2011, *Register of contractors*, January 2011.
- Mugenda O & Mugenda A 2003, 'Research Methods: Qualitative and quantitative approaches, Acts Press.
- Mulvey M 1998, *10th Symposium Construction Innovation and Global Competitiveness*, Ben Obinero Uwakweh and Issam A. Minkarah CRC Press 2002, PP. 771–787.
- Murdoch J & Hughes W 2000, *Construction Contracts Law and Management*, 3<sup>rd</sup> ed., Spon Press, London
- Mutai, BK 2000, *How to write quality Research Proposal: A complete and simplified recipe*, Thelley Publications. 1<sup>st</sup> edn., Newyork.
- Ng Chu Yin 2006, 'Problems associated with nominated subcontractors in Malaysia construction industry', unpublished Thesis Master of science construction contract management, University of Malaysia.
- Ngari HK 1990, 'Roles of subcontractors in modern contracting, unpublished undergraduate research project, Department of Real Estate and Construction Management, University of Nairobi.
- Nobbs, H 1993, 'Future role of construction specialists', Business Round Table, London.
- Nooteboom, B 2003, ' An integrated survey of the theory on sourcing, inter-firm Collaboration and Networks', Rotterdam School of Management, Rotterdam.
- Organisation for Economic Co-operation and Development 2005, *Encouraging linkages between small and medium-sized companies and multinational enterprises: An Overview of Good Policy Practice*, Paris, viewed 25 September 2011  
<<http://www.oecd.org/dataoecd/62/30/35795105.pdf>>
- Organisation for Economic Co-operation and Development 2007, *enhancing the role of smes in global value chains: Background report*, Paris, viewed 25 September 2011  
<<http://www.oecd.org/dataoecd/27/43/38900592.pdf>>

- Peacocke, D 1978, 'Sub-contracts,' paper presented at the 429 project management conference:, London, UK, 5-7 March.
- Puttick, RJ 1978, 'The implications of employing subcontractors, unpublished dissertation, University of Witwatersrand
- Reeves, K 2002, Construction business systems in Japan: *general contractors and subcontractors*, Building Research and Information, Vol. 30, No. 6, 413-424.
- Republic of Kenya 2012, *Statistical abstract*, Government printers, Nairobi.
- Richard, H, Clough, A & Glenn, A 1994, 'Construction contracting, 6th edn, John Wiley & sons inc., New York.
- Richter, I & Mitchell, R.S 1982, 'Handbook of Construction Law and Claims', Reston, Virginia
- Rudestam, KE & Newton R 2001, 'Surviving your dissertaion. A comprehensive Guide to content and process, 2<sup>nd</sup> edn, Sage Publications, California, USA.
- Russell, A & McGowan N 1984, *Proceedings of the 1984 CIB W-65 Symposium on Organization and Management of Construction on the Subcontractor control for high-rise construction*, Organizing and Managing Construction, CIB W65, Vol. 1, UK. U.S. National Academy of Sciences, Washington, D.C., U.S.A,
- Seeley, IH 1997, *Quantity surveying practice*, 2<sup>nd</sup> edn., Macmillan Press Ltd. U.K.
- Smith, AJ 1995, *Estimating, tendering and bidding for construction: theory and practice*, Basingstoke, Macmillan, p.256.
- Talukhaba, AA 1999, 'An investigation into the Factors Causing Construction Delays in Kenya: A case study of high rise building projects in Nairobi, unpublished PhD Thesis, University of Nairobi.
- Talukhaba, AA 1988, 'Time and Cost Performance of Construction Projects', unpublished M.A Thesis, University of Nairobi.

Talukhaba, AA & Mapatha, M 2007, 'Selection framework for domestic subcontractors by contractors in the construction industry, paper presented at the CIB World Building Congress, 2007, pp.768-778.

Thomas S, Skitmore M, Chung W 2003, *CIB TG 23 International conference*, October 2003, Hong kong

Thomas EU & Philip D 2009, *Fundamentals of building contract management*, 2<sup>nd</sup> edn., University of New South Wales Press Ltd, Australia.

Thompson, PJ & Sanders, SR 1998, 'Partnering Continuum', *Journal of Management in Engineering*, ASCE Vol. 14, No. 5, pp. 73-78.

Tse and Ganesan. (1997). Causal relationship between construction flows and GDP: evidence from Hong Kong. *Construction Management and Economics*, Vol.15, pp.371-376.

United Nations Industrial Development Organisation (UNIDO) 2003, *International Subcontracting Versus Delocalisation? a survey of the literature and case studies from the spx network*, Vienna, Austria, viewed 25 September 2011  
<[http://www.unido.org/fileadmin/import/18187\\_SPXversusDELOCinonedoc.pdf](http://www.unido.org/fileadmin/import/18187_SPXversusDELOCinonedoc.pdf)>

UNRWA 2006, *Projects completion reports*, UNRWA, Gaza.

Woon, H.L & Ofori, G 2000, 'Effect of registration on performance of construction subcontractors in Singapore', *Journal of Engineering, Construction and Architectural Management*, Vol. 7, No. 1, 29-40.

Yan-Chyuan S, Tsung-Pin T & Wen-Chian W 1998, 'Use of questionnaire and AHP techniques to developer subcontractor selection system, *Journal of Construction Engineering and Management*, ASCE, Vol.118, No.4, 1-6.

Wells, J. (2007) *Informality in the construction sector in developing countries*, *Construction Management and Economics*, 25: 87-93.

MAIN CONTRACTOR APPENDIX A QUESTIONNAIRE

**INTRODUCTION LETTER**

This questionnaire attempts to study the effect of relationships between main contractors and their subcontractors on the performance of a construction project.

**DECLARATION**

Responses contained in this questionnaire shall be treated with utmost confidentiality and used only for this research.

**TOPIC**

**A study on the Impact of Main Contractor - Subcontractor Relationships on the Performance of Construction Projects**

**(A Case Study of the Kenyan Construction Industry)**

**Addressed to:**

The most informed person in the construction firm.

Questionnaire Number:.....

Date:.....

## APPENDIX B

### MAIN CONTRACTORS SURVEY QUESTIONNAIRE

Please fill in the blank spaces. Where options are provided, tick in the box alongside the appropriate choice.

#### Background Information

1) In what capacity do you serve in this firm?

- Director
- Project Manager
- Site Manager/Agent
- Supervisor
- General foreman

2) How many years have you served in this firm?

- Less than 1 year
- 1-5 years
- 5-10 years
- 10-15 years
- More than 15 years

3) How many years of working experience do you have in the construction industry?

- Less than 1 year
- 1-5 years
- 5-10 years
- 10-15 years
- More than 15 years

4) How many years has your firm been in business?

- Less than 1 year
- 1-5 years
- 5-10 years
- 10-15 years
- More than 15 years

5) Under what category of contractors registration by the Ministry of Public Works is your firm registered?

Class A

Class B

Class C

Class D

Class E

Class F

Class G

Class H

6) What type of works does your firm specialize in?

Electrical installations

Plumbing and Drainage works

Joinery works

Aluminium works

Interior fittings

Lift installations

Earthworks

Steel works

Roofing works

Masonry works

Structure cabling

Art works (murals)

Air conditioning works

Other (specify).....

7) What is the biggest project you handled as a subcontractor?

0 - 20M

20 - 50M

50 - 100M

100- 150M

150 - 300M

Above 300M



8) What are your key strengths as a firm to handle a big project?

- i).....
- ii) .....
- iii).....
- iv).....

**Procurement of subcontractors**

9) How do you mostly get engaged in a project to work as a subcontractor?

- Through consultants
- Through clients
- Through contractors
- Through advertisements – Newspapers, internet
- Other method (specify).....

10) What is your preference when subcontracting?

- Domestic subcontractors
- Nominated subcontractors
- Approved subcontractors (suggested by Client and approved by contractor)

11) What reasons make you prefer the system named in 10 above?

- i).....
- ii) .....
- iii).....
- iv).....

- 12) The following are influential factors during the selection of the main contractor to work with. Please indicate their level of influence  
 Levels of Influence: Very Influence=VI (5), Influence=4 (I), Somewhat Influence=3, (SI), Less Influence=LI (2) and Not Influence=NI (1)

Level of influence					
Levels of influence: Very Influential =VI(5), Influential =I(4), Somewhat Influential=SI(3), Less Influential =LI(2), Not Influential =N(1)					
Selection criteria for main contractor	Levels of Importance to the subcontractor				
	VI	I	SI	LI	NI
	5	4	3	2	1
Past relationship with main contractor					
Specific activity according to nature of project					
Reputation of the main contractor's firm					
Bid price					
Financial capability					
Technical capacity					
Safety consciousness					
Quality consciousness					
Time consciousness					
Equipment and plant owned					
Compliance with statutory requirements					

**As a Domestic Subcontractor**

- 13) Which is your best selection method to be a Domestic Subcontractor?

- Open competitive bidding  
 Selective bidding  
 Single sourcing  
 Serial contracting (using one subcontractor always)

- 14) Why has the method cited above been most favourable?

- i).....  
 ii) .....  
 iii).....  
 iv).....  
 v).....

- 15) Suggest any improvements that can be made in selection of domestic subcontractors.

- i).....  
 ii) .....  
 iii).....  
 iv).....

16) As a domestic subcontractor, what form of subcontract agreement do you commonly enter into with main contractors?

JBC/KABCEC

FIDIC

Same as for MC/Client

Custom-made

Verbal

17) What challenges/issues do you face as a Domestic subcontractor?

i).....

ii).....

iii).....

iv).....

18) Are you involved in drawing up programme of works for a project?

Yes

No

19) What is your primary motivation as a domestic subcontractor?

Get known in the market

Make profit

Build a relationship with main contractor

Be in business ( whether making profit or loss or breaking even)

Other (specify).....

**As a Nominated Subcontractor**

20) Which is your best selection method to be a Nominated Subcontractor?

Open competitive bidding

Selective bidding

Single sourcing

Serial contracting (using one subcontractor always)



26) What is your primary motivation as a nominated subcontractor?

- Get known in the market
- Make profit
- Build a relationship with main contractor
- Be in business ( whether making profit or loss or breaking even)
- Other (specify).....

**General**

27) How do you solve your problems with the main contractor, when you are:

a) Domestic Subcontractor

- i).....
- ii) .....
- iii).....
- iv).....

b) Nominated Subcontractor

- i).....
- ii) .....
- iii).....
- iv).....

28) The following issues affect main contractor-subcontractor relationship. How do you rate their effect on performance of a project?

Aspect	Low	Medium	High
Organization			
Communication			
Inter-organizational conflicts			
Financial capacity of contractors			
Cooperation			
Coordination			
Performance on site			
Financial management			
Relationship with main contractor			
Site management			
Commitment to work			

29) Do you engage any subcontractors?

Yes

No

30) What measures/steps do you suggest would eliminate or minimize the problems encountered between main contractors and subcontractors on projects?

- i).....
- ii) .....
- iii).....
- iv).....

**Thank you for taking time to respond to this Questionnaire.**

## APPENDIX C

### SPECIALIST CONTRACTORS SURVEY QUESTIONNAIRE

Please fill in the blank spaces. Where options are provided, tick in the box alongside the appropriate choice.

#### Background Information

1) In what capacity do you serve in this firm?

- Director
- Project Manager
- Site Manager/Agent
- Supervisor

2) How many years have you served in this firm?

- Less than 1 year
- 1-5 years
- 5-10 years
- 10-15 years
- More than 15 years

3) How many years of working experience do you have in the construction industry?

- Less than 1 year
- 1-5 years
- 5-10 years
- 10-15 years
- More than 15 years

4) How many years has your firm been in business?

- Less than 1 year
- 1-5 years
- 5-10 years
- 10-15 years
- More than 15 years

5) Under what category of contractors registration by the Ministry of Public Works is your firm registered?

Class A

Class B

Class C

Class D

Class E

Class F

Class G

Class H

6) What type of works does your firm specialize in?

Electrical installations

Plumbing and Drainage works

Joinery works

Aluminium works

Interior fittings

Lift installations

Earthworks

Steel works

Roofing works

Masonry works

Structure cabling

Art works (murals)

Air conditioning works

Other (specify).....

7) What is the biggest project you handled as a subcontractor?

0 - 20M

20 - 50M

50 - 100M

100- 150M

150 - 300M

Above 300M



8) What are your key strengths as a firm to handle a big project?

i).....

ii).....

iii).....

iv).....

**Procurement of subcontractors**

9) How do you mostly get engaged in a project to work as a subcontractor?

Through consultants

Through clients

Through contractors

Through advertisements – Newspapers, internet

Other method (specify).....

10) What is your preference when subcontracting?

Domestic subcontractors

Nominated subcontractors

Approved subcontractors (suggested by Client and approved by contractor)

11) What reasons make you prefer the system named in 10 above?

i).....

ii).....

iii).....

iv).....

12) The following are influential factors during the selection of the main contractor to work with. Please indicate their level of influence

Levels of Influence: Very Influence=VI (5), Influence=4 (I), Somewhat Influence=3, (SI), Less Influence=LI (2) and Not Influence=NI (1)

Level of influence					
Levels of influence: Very Influential =VI(5), Influential =I(4), Somewhat Influential=SI(3), Less Influential =LI(2), Not Influential =N(1)					
Selection criteria for main contractor	Levels of Importance to the subcontractor				
	VI	I	SI	LI	NI
	5	4	3	2	1
Past relationship with main contractor					
Specific activity according to nature of project					
Reputation of the main contractor's firm					
Bid price					
Financial capability					
Technical capacity					
Safety consciousness					
Quality consciousness					
Time consciousness					
Equipment and plant owned					
Compliance with statutory requirements					

**As a Domestic Subcontractor**

13) Which is your best selection method to be a Domestic Subcontractor?

- Open competitive bidding
- Selective bidding
- Single sourcing
- Serial contracting (using one subcontractor always)

14) Why has the method cited above been most favourable?

- i).....
- ii) .....
- iii).....
- iv).....
- v).....

15) Suggest any improvements that can be made in selection of domestic subcontractors.

- i).....
- ii) .....
- iii).....
- iv).....

16) As a domestic subcontractor, what form of subcontract agreement do you commonly enter into with main contractors?

JBC/KABCEC

FIDIC

Same as for MC/Client

Custom-made

Verbal

17) What challenges/issues do you face as a Domestic subcontractor?

i).....

ii) .....

iii).....

iv).....

18) Are you involved in drawing up programme of works for a project?

Yes

No

19) What is your primary motivation as a domestic subcontractor?

Get known in the market

Make profit

Build a relationship with main contractor

Be in business ( whether making profit or loss or breaking even)

Other (specify).....

**As a Nominated Subcontractor**

20) Which is your best selection method to be a Nominated Subcontractor?

Open competitive bidding

Selective bidding

Single sourcing

Serial contracting (using one subcontractor always)



26) What is your primary motivation as a nominated subcontractor?

- Get known in the market
- Make profit
- Build a relationship with main contractor
- Be in business ( whether making profit or loss or breaking even)
- Other (specify).....

**General**

27) How do you solve your problems with the main contractor, when you are:

a) Domestic Subcontractor

- i).....
- ii) .....
- iii).....
- iv).....

b) Nominated Subcontractor

- i).....
- ii) .....
- iii).....
- iv).....

28) The following issues affect main contractor-subcontractor relationship. How do you rate their effect on performance of a project?

Aspect	Low	Medium	High
Organization			
Communication			
Inter-organizational conflicts			
Financial capacity of contractors			
Cooperation			
Coordination			
Performance on site			
Financial management			
Relationship with main contractor			
Site management			
Commitment to work			

29) Do you engage any subcontractors? QUESTION 29

Yes

No

30) What measures/steps do you suggest would eliminate or minimize the problems encountered between main contractors and subcontractors on projects?

i).....

ii).....

iii).....

iv).....

**Thank you for taking time to respond to this Questionnaire.**

## APPENDIX D

### ARCHITECTURAL FIRMS SURVEY QUESTIONNAIRE

Please fill in the blank spaces. Where options are provided, tick in the box alongside the appropriate choice.

#### Background Information

1) In what capacity do you serve in this firm?

Director/Partner/Principal

Assistant Architect

Draughtsman

2) How many years have you served in this firm?

Less than 1 year

1-5 years

5-10 years

10-15 years

More than 15 years

3) How many years of working experience do you have in the Architectural professional practice?

Less than 1 year

1-5 years

5-10 years

10-15 years

More than 15 years

4) How many years has your firm been in business?

Less than 1 year

1-5 years

5-10 years

10-15 years

More than 15 years

5) What is the biggest project you handled as a subcontractor?

- 0 - 20M
- 20 - 50M
- 50 - 100M
- 100- 150M
- 150 - 300M
- Above 300M

6) How do you deal with specialists works?

- Leave to client to decide
- Leave to main contractor to decide
- Advise the Employer to Nominate specialist subcontractors

**Procurement of subcontractors**

7) The following are criteria for selection of a subcontractor. Please indicate their level of influence when selecting a subcontractor

Levels of Influence: Very Influential=VI (5), Influential=I(4), Somewhat Influential=3, (SI), Less Influential=LI (2) and Not Influential=NI (1)

**Level of influence**

Levels of influence: Very Influential =VI(5), Influential =I(4), Somewhat Influential=SI(3), Less Influential =LI(2), Not Influential =N(1)

Selection criteria for subcontractors	Levels of Influence to the main contractor				
	VI	I	SI	LI	NI
	5	4	3	2	1
Bid price					
Past working relationship					
Reputation of the subcontractor's firm					
Technical capacity					
Equipment and plant owned					
Specialised nature of project works					
Financial capability					
Quality consciousness					
Safety and Health consciousness					
Compliance with statutory requirements					



**Subcontracting arrangements**

- 8) Please tick against the contract documents that you specify/suggest for use between main contractors and Nominated subcontractors and indicate the reason?

Document	Specified/ Suggested	Reason
JBC/KABCEC		
FIDIC		
Custom-made		
Verbal		

- 9) From your experience, with regard to main contractor-subcontractor relationships, how do you rate the performance of the subcontractors in the following areas?

Aspect	Domestic Subcontractors			Nominated Subcontractors		
	Low	Medium	High	Low	Medium	High
Firms organization structure						
Communication with main contractor						
Inter-organizational conflicts between main contractor and subcontractors						
Financial capacity of subcontractors						
Cooperation between main contractor and subcontractors						
Coordination between main contractor and subcontractors						
Work Performance on site						
Working relationship with main contractor						
Site management						
Attitude to claims						
Adherence to cost estimate						
Industry awareness						
Commitment to work						

10) What complaints do you receive from sub-contractors about the main contractor?

*Please rate them in percentage*

Complaint	Nominated subcontractors (%)	Domestic subcontractors (%)	Approved subcontractors (%)
Non payment			
Attendance issues			
Extension of time			
Provision of insurance for the works, C.A.R			
Submission and implementation of work programmes			
Other (specify and rate) ..... .....			
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

11) What complaints do you receive from main contractor about sub-contractors?

*Please rate them in percentage*

Complaint	Nominated subcontractors (%)	Domestic subcontractors (%)	Approved subcontractors (%)
Non adherence to work programme – delays in work progress			
Non provision of insurance and indemnity			
Lack of coordination in execution of works			
Competence of the subcontractor			
Other (specify) ..... .....			
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

12) How do you solve the problems faced by :

a) Main contractors about the sub-contractors

i).....

ii) .....

iii).....

b) Sub-contractors about the main contractors

i).....

ii) .....

iii).....

13) What are the reasons for using of the following type of sub-contractors in a project?

a. Nominated Subcontractors

- i).....
- ii) .....
- iii).....
- iv).....

b. Domestic Subcontractors

- i).....
- ii) .....
- iii).....
- iv).....

c. Approved Subcontractors

- i).....
- ii) .....
- iii).....
- iv).....

14) What problems/challenges are associated with each of the following type of sub-contractors?

a. Nominated Subcontractors

- i).....
- ii) .....
- iii).....
- iv).....

b. Domestic Subcontractors

- i).....
- ii) .....
- iii).....
- iv).....

c. Approved Subcontractors

i).....

ii).....

iii).....

iv).....

15) From your experience, which type of sub-contract is the best to use in a building project?

Nominated

Domestic

Approved

16) Please give the main reasons for your preference of the choice above.

i).....

ii).....

iii).....

17) Kindly give some recommendations that can be used in sub-contracting that can improve the relationship between parties.

i).....

ii).....

iii).....

iv).....

**Thank you for taking time to respond to this Questionnaire.**



**UNIVERSITY OF NAIROBI**

**DEPARTMENT OF REAL ESTATE AND CONSTRUCTION MANAGEMENT**

**P.O. Box 30197, 00100 Nairobi, KENYA, Tel: No. +254-2-2724529**

**E-mail: dept-recm@uonbi.ac.ke**

February 7<sup>th</sup> 2012

**TO WHOM IT MAY CONCERN**

**RE: EDITH MUENI MWINDE – B50/72194/2008**

The above named is a student of this Department pursuing a Master of Arts Degree in Construction Management. She is currently in her final year of the course and is writing a research project titled **“A study on the impact of contractor-subcontractor relationships on the performance of construction projects: A Case Study of Kenya Construction Industry”**

The purpose of this letter therefore is to request you kindly to allow her access into any kind of material she might require from your organization to enable her complete the project successfully. The information given will be used for research purposes only.

Any assistance accorded to her will be highly appreciated.

**Mary Kimani, PhD, MBS**  
Chair & Senior Lecturer  
Department of Real Estate & Construction Management