University of Nairobi

INFLUENCE OF INFORMAL SUBCONTRACTING ON HEALTH AND SAFETY PERFORMANCE ON CONSTRUCTION PROJECTS THE CASE OF NAIROBI CITY COUNTY

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DECLARATION OF THE CANDIDATE

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

Signature.....

Date. 15TH/AUGUST/2021.

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DEDICATION

First and foremost, the almighty God takes the glory for giving me the strength and focus to do this research. My dear mother, Dorothy Kamende for standing with me in my formative years and my dear wife Charity Wangari for her encouragement and support. To my lovely daughters, Prudence Mwende, Patience Wanjiku and Precious Mutheu- I salute you for your patience and love.

ABSTRACT

Informality in the construction industry sub-sector is part of the growing informal economy of Kenya today. The main purpose of the study was to investigate the influence of informal subcontracting and its effects on health and safety performance on construction projects. The objectives focused on identification of health and safety (H&S) provisions, compliance of the two Acts, Occupational Safety and Health Act, (OSHA 2007), National Construction Authority Act (NCA 2011) and examination of possible relationship between organisation challenges of informal subcontractors and H&S performance on construction projects.

The study objectives were dually achieved by use descriptive and qualitative survey research methods. Data was collected using questionnaires and structured interviews. The findings indicated that the building subsector preferred labour only subcontracts because of their informality and flexibility while specialist contractors preferred nominated subcontractors due to the greater need for skilled labour. OSHA Act compliance indicated that 27.4%. of the contractors had site safety policies but implementation of the same was a partly 2%. This was further exemplified by the prevalent nature of accidents at the construction sites particularly minor injury category, an indication of weak enforcement by the regulatory agencies.

Clients influence on the H&S organisational challenges of informal subcontractors was most significant. Clients should therefore take a leading role in H&S by employing only contractors with good H&S track record and investing in health and safety provisions in tender documents. The regulatory regimes should ensure effective registration and regulation of construction workplaces; enhanced capacity required to enforce, restrict and control errant contractors so as to mitigate the effects of informal subcontracting on health and safety performance on construction projects.

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AAK	Architectural Association of Kenya.
ANOVA	Analysis of Variance
BC	Building Contractor
BQ	Bill of Quantities
CDM	Construction Design and Management Regulations 2007
CSAO	Construction Safety Association of Ontario (CSAO) 1993
DOSHS	Directorate of Occupational Safety and Health Services
EMR	Experience Modification Rating
HSE	Housing & Safety Executive.
H&S	Health and Safety
KNBS	Kenya National Bureau of Statistics.
LSD	Least Significant Difference.
MC	Main Contractor
NEMA	National Environment Management Act.
NCA	National Construction Authority
OSHA	Occupational Safety and Health Act, 2007.
PPE	Personal Protective Equipment
PSU	Primary Sampling Units
SC	Specialist Contractor
SPSS	Statistical Package for the Social Science
UK	United Kingdom
UNIDO	United Nations Industrial Development Organization

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Subcontracting is a relationship between firms mostly depending upon whole or partial production of goods and services. Lee and Baldwin (2008) describe subcontracting as a business strategy that is used by main contractors to deal with uncertainties in the construction industry and to transfer financial risks, completion risks and responsibility to subcontractors. According to Gonzalez, Arrunada, and Fernandez (2000) subcontracting reduces direct costs and overheads, and allows main contractors to use better knowledge of the local market conditions and facilitates the production of quality work through the use of specialist subcontractors with the necessary knowledge and skills in specialized trades (Lee and Baldwin 2008). According to Muinde (2012) subcontracting allows the main contractor to reduce operating costs and thereby enhance competitiveness.

The use of subcontracting as a business strategy has global outreach, not only in the construction sector but also in other sectors, with the aim of reducing the payroll and elevating flexibility. However, subcontracting arrangements, depend on country's characteristics as argued by Brandli (1998) below: -

i)Japan:- there are two types of subcontractors , large contractors that get involved from the project stage to maintenance and smaller firms which supply services and materials to specialized companies.

ii) United States of America: - contractors with specialised global knowledge about their activities. They compete for projects and take responsibilities for their performance.

iii) United Kingdom (UK): -Contracting parties usually subcontract all activities using specialized subcontractors appointed by consultants and other contracting parties(Manu et al., 2013).

iv) Brazil: - According to Cardoso (1996) construction companies usually subcontract parts of their works to third parties. These subcontracts have technical and financial aspects such as formulation of projects, procurement and supply of plant and construction at the building site.

v) Kenya: - labour and works subcontracting is widely practiced in Kenya were Fundis or craftsmen are sublet work by main contractors. This practice has gained traction and the growth of specialized small enterprises offering labour for common tasks such as concreting or painting as evidenced by Ngare (1998) and Wachira (2001) has produced a big pool of construction works in the informal sector.

Kenya's construction industry is well developed and vibrant. According to the Economic survey (2019) done by Kenya National Bureau of Statistics (KNBS 2019), the building and construction sector registered a slowed growth of 6. 3% in 2018 in comparison to an increased growth of 8.5% in 2017. The private building works accomplished in Nairobi City County had a reported index growth of 5.3% from 443.1 to 466.8 points in 2017 and 2018 respectively. At the same duration, the reported index of completed works in the public buildings sector reduced by 2.5% from 59.4 points to 57.9 points (KNBS, 2019). Commercial banks' advances and loans to the build-up sector rose by 1.8% from Kes.112.0 billion in 2017 to Kes.114.0 billion in 2018 (KNBS, 2019). Consumption of cement rose slightly by 1.6% to 5948.7 thousand tonnes in 2018 as summarized in Table 1.1 below: -

Table 1.1: Selection of Key Economic Indicators: Building Sector, 2014 -2018
1982=100

Indicator	2014	2015	2016	2017	2018*
Index of reported private building works completed in Nairobi City County	341.4	369.4	409.3	443.1	466.8
Index of completed public buildings completed in major towns	106.1	112.6	69.2	59.4	57.9
Index of government expenditure on roads	263.4	350.3	462.8	388.0	460.9
Index of Employment	220	245	269.9	277.1	284.1
Cement consumption ('000 tonnes)	5,196.7	5,708.8	6,310.1	5,857.9	5,948.7
Private Employment ('000 persons)	125.3	140.2	155	159.4	163.0
Public Employment ('000 persons)	7.6	7.9	8	8.5	8.6
Loans and Advances from Commercial Banks to the sector (Kes Mn)	80,406.00	107,842.60	104,825.80	111,985.2	114,014.9

* Provisional.

Source: Kenya National Bureau of Statistics, 2019.

In the buildings sector, employment rose by 2.2% from 167.9 to 171.6 thousand persons in 2017 and 2018 respectively(KNBS, 2019). For the unskilled, monthly average basic wage, increased by 5.1%, while for semi-skilled and skilled workers, the wages increased by 5.3% and 5.6% respectively in 2018, as recommended by the collective bargaining agreements (KNBS, 2019). The bipartisan negotiation of wages between employer associations in the construction sector and their respective employees' unions was as summarized in Table 1.2 below: -

Table 1.2: Monthly Average Basic Wages: Building Sector,2014-2018

	Kes				
Category of Workers in the Building Sector	2014	2015	2016	2017	2018
Unskilled…….	16,994	18,771	20,174	21,497	22,586
Semi -Skilled……	23,500	25,868	27,902	29,757	31,348
Skilled…….	33,832	37,127	40,187	42,794	45,171

Source: Ministry of Labour and Social Protection, 2019.

In Nairobi City County, the total value of completed private buildings increased

by 4.6% from Kes.86.1 to Kes 90.1 billion in 2017 and 2018 respectively while the value of completed public buildings rose from Kes.1.5 billion to Kes.2.3 billion in 2017and 2018 respectively, as summarized in Table 1.3 below: -

Table 1.3 Reported Units of Private and Public Buildings Completed, 2014-2018

Year	Private			Public Residential		Number
	Residential	Non-Residential	Total	National Housing Corporation	State Department for Housing	Total
2014……	6,538	9,85	7,523	243	0	243
2015……	7,834	1,220	9,054	45	0	45
2106……	8,806	1,462	10,268	240	822	1,062
2017……	9,864	2,038	11,902	0	1,164	1,164
2018*……	10,364	1,940	12,304	180	250	430

Source: Nairobi City County, National Housing Corporation &The State Department of Housing 2019. * Provisional

The development of an efficient construction industry is a noble policy in most countries. However, the focus of research and technical assistance to date has largely been upon the enterprises that are in the formal sector – the contractors, subcontractors and consultants (Wells 2007). According to Mitullah and Wachira (2003), there has been neglect in the informal subcontracting where unsecure contracts draw in large labour force with little regard to site health and safety.

1.2 STATEMENT OF THE PROBLEM

Most main contractors provide site management personnel to manage the operations of the subcontractors and let them execute the entire works. Depending on the scope of a

project, the site management personnel could include project director, site manager, construction manager and H&S manager (Muinde,2012). All these contractual arrangements are formal, however informal subcontracting is widely practiced in Kenya by main contractors who bring on board subcontractors as in-house employees thereby opening the window of informality in construction projects. Informality brings on board site operatives of unknown qualifications, untested working site culture and undocumented persons without adequate insurance risk covers (Wells, 2007).

According to Manu et al. (2013), subcontracting issues are identified as being responsible for adverse influence on H&S. In an environment of informality, competence issues especially in multi-layer subcontracting,bring to the fore adverse H&S performance in construction projects (Wells, 2007). Multi-layer subcontracting occurs when there are several tiers down the supply chain in the contract.These multi-layers bring on board communication problems, interest of subcontractors in making their profit with less commitment to H&S, and unfamiliarity of subcontractors with the H&S practices of main contractors. In the Kenyan context multi-layer subcontracting usually gravitate to informal subcontracting, where subcontracts have little or no legal backing (Wells, 2007).

Fluctuation of labour requirements in Kenya and the flexibility in the construction sector due to contraction of labour has resulted in subcontracting of works either partly or whole projects (Wells and Wall, 2003).This emerging trend in employment to very small enterprises suggests that the larger contractors operating in Kenya and other countries in Africa have scaled down directly employed workers and resorted to subcontractors and other intermediaries for their labour supply which are very informal in nature (Wells 2007). This apparent shift by general contractors to transfer the risks of labour management to subcontractors has created an informality, which has a negative bearing on good H&S performance in the projects handled by these subcontractors and their respective intermediaries (Wachira and Wells, 2001).

The local situation in Kenya of occupational H&S, confirm challenges faced by client organizations, such as inadequate safety management systems, improper training and poor inductions in construction sites due to these informal subcontracting practices (Omwenga et al ,2011). Moreover, the increased informal subcontracting in Kenya sites coupled with concurrent deteriorating H&S standards suggests that the two are related and confirms the genesis of the many collapsing buildings in Nairobi. Absence of formal agreements between the contracting parties has facilitated informality to find its way into subcontracting of works and services in the construction sites (Kirombo 2011).

Despite the above possibilities, this research was undertaken to further explore the possible link between the deteriorating H&S standards and informal subcontracting. It is for this reason that the study investigated the influence of informal subcontracting and its effects on H&S performance on construction sites.

1.3 RESEARCH OBJECTIVES

The main purpose of the study was to investigate the influence of informal subcontracting and its effects on health and safety performance on construction projects. The specific research objectives were: -

i) To identify the level of H&S provision in informal subcontracting
ii) To establish the level of compliance of OSH Act 2007 by informal subcontractors.
iii) To establish the extent of compliance of NCA Act 2011 by informal subcontractors.
iv) To examine whether or not there is a relationship between organization challenges of informal subcontractors and H&S performance on construction projects.

1.4 RESEARCH HYPOTHESIS

The main research objective was designed to investigate the influence of informal subcontracting and its effects on health and safety performance on construction projects. The null hypotheses (H_0) and alternate the null hypotheses (H_a) for the research was: -

(H_0) Influence of informal subcontracting does not affect health and safety performance on construction projects.

(H_a) Influence of informal subcontracting affects health and safety performance on construction projects.

1.5 SCOPE AND LIMITATIONS OF STUDY

Nairobi City County has a vibrant construction economy compared to other counties in Kenya. It was the area of the study because of the many H&S occurrences found here. The scope of the study was on the influence of informal *subcontracting* and its effects on H&S performance on construction projects. In this research, main contractors, subcontractors and the regulatory framework agencies which enforce compliance of H&S practices formed part of the study. H&S policies from client organizations were used to complement regulatory framework and main contractor's own in-house practices. The study was carried out during a downturn in the economy which greatly affected contractors and collection of data from projects sites took a longer time than earlier anticipated.

1.6 JUSTIFICATION OF THE STUDY

Ankrah (2007) found that when the layers of subcontracting increased there was a downward trend in H&S performance, confirming that the influence of subcontracting had a role in safety performance on construction sites (Sawacha *et al*. ,1999). According to Muiruri (2012) many site operatives in Nairobi, endanger their lives by working without the appropriate gear, poor communication and disregard of safety guidelines. To reduce costs, some subcontractors overlook the provision of protective clothing such as helmets,

goggles, and proper footwear(Muiruri, 2012). Irresponsible attitudes are in the long run, costly to the main contractor because of extra health care expenses of injured workers, which slow the project. Most insurance claims arising from construction accidents overrun insurance cover for many other industry players and are bound to have extensive effects, to the project as a whole (Muiruri, 2012). Subsequently there could exist a relationship between organisation challenges of informal subcontracting and H&S performance on projects within the buid-up sector (Wells, 2007).

This study interrogated the prevailing causes of this relationship and how it could be minimized through inter-organizational partnering opportunities for all the actors in the construction industry. With H&S becoming an important objective on construction projects, the research was geared to explore extensively into the role of informal subcontracting practice on how it undermines health and safety performance on a building project. There is indeed a triangular participation in a construction project in matters to do with health and safety, i.e., the regulatory frameworks, the client and the main contractor. The role of subcontracting plays an important part of construction, and this research represented a significant contribution to the body of knowledge in the construction industry (Wells, 2007).

1.7 DEFINITION OF TERMS

Main Contractor: -The prime or the general contractor who subcontracts work to the subcontractors.

Subcontractor: - Specialist contractors in the building industry e.g., electrical, air conditioning etc. There are others who carry out labour or material supply subcontracting.
Informality: - The absence of regulation in the construction process (Wells, 2007).

Multi-layer subcontracting: -Occurs when there are several tiers down the supply chain in the building contract (Wong, 1999 and Lee, 1996).

Subcontracting Practice: - The mode of subcontracting which informs the type of practice the subcontractor will use e.g., formal or informal (Webster et al, 1997).

Informal Subcontracting: - subcontracting where legal documentation is usually absent and many details of contract touching on health and safety scanty. (Muinde, 2012).

Intermediary: - A labour broker or labour agent used by contractors/subcontractors to recruit construction workers. (Vaid, 1999).

Safety Performance: - The H&S status of construction in a work environment (Levitt and Samuelsson, 1987).

Regulatory framework: - A body of statutory guidelines that seek to regulate building By -laws in relevant legislations (Gelder, 2004).

Site Culture: - The working, social processes and norms, found in construction site environment (Lash 2000; Tulloch and Lupton, 2003).

1.8 STUDY METHODOLOGY

The methodology adopted in the research was guided by the study objectives. Data was collected from main contractors and subcontractors through questionnaires, while structured interviews were carried with the two regulatory agencies-Directorate of Occupational Safety and Health Services (DOSHS) and National Construction Authority (NCA).

The data was analyzed using statistical mathematical method of interrogating and looking for relationships between different sets of variables and the results of the analysis summarized as charts, graphs and tables for ease of understanding.

1.8.1 RESEARCH PROCESS

The research process used explains the strategy of the study. The subject area was studied to establish the objectives and hypotheses for the purpose of the research. The Literature review from previous researches was investigated to provide initial primary content upon which secondary data from the field survey would be used to draw analyses, findings and conclusions as articulated in the figure 1.1 below: -

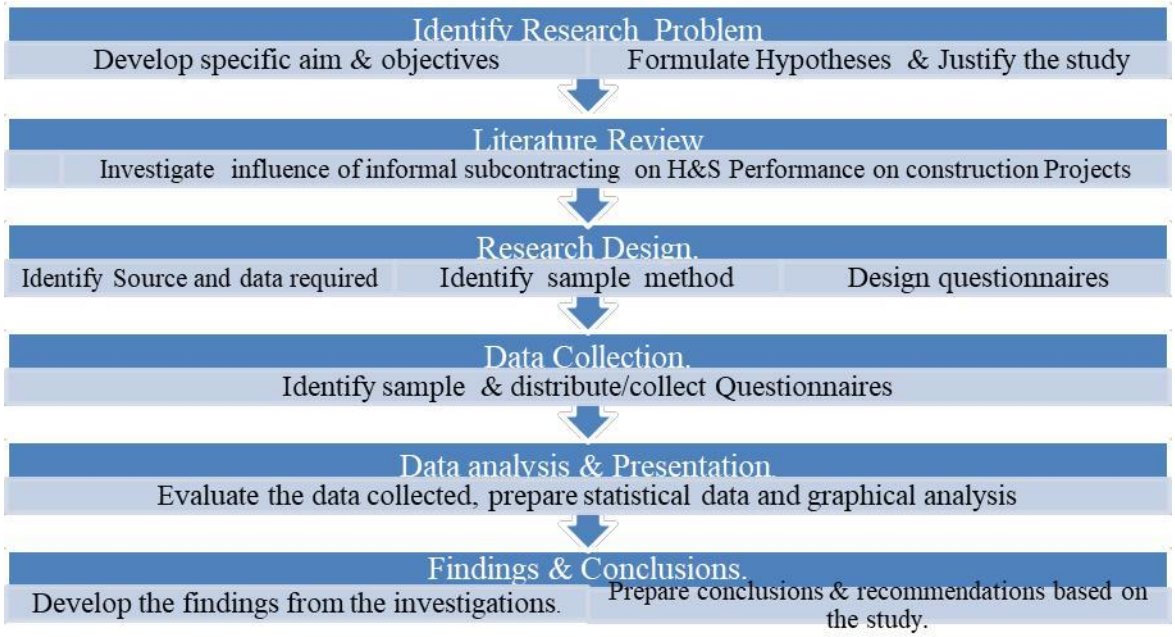

Figure 1.1: The research process of the study

Source: Author, 2019

1.9 ORGANIZATION OF THE STUDY

The study was organized in five parts.

The first chapter provided a general introduction and background information of the research area, problem statement, study objectives and research hypotheses. It also provided the scope of the research, justification for the study, definition of the significant terms, research methodology and study process (Creswell, 2014).

Theoretical framework of the study was covered in chapter two. Literature review related to methods and challenges of subcontracting in regard to occupational health and safety were studied in this section. The theoretical review gave the basis of evaluation of the secondary data to enable the researcher arrive at conclusions of the research.

The third chapter outlined the research methodology used in the study.Explanations done in the chapter were on the research design, type of sampling and data collection methods, sampling tools, data presentation and analysis techniques adopted for the study (Kothari, 2004).

Data collection from the field survey was covered in chapter four. The findings of the research were guided by study objectives of the research. The hypotheses of the study were tested at the end of this chapter.

Lastly chapter five provided the findings, conclusions, recommendations of the study and area of further research.

1.10 CONCLUSION

The first chapter outlined the influence of informal subcontracting and its effects on H&S performance in construction projects as main purpose of the research. The succeeding second chapter of literature review, provided theoretical framework which guided the study by giving relevant content on past studies locally and globally.

CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

Subcontracting has benefits when it is practiced in the construction industry. Economic benefit is usually the driving force because of the ability to outsource whole or parts of work thereby freeing the main contractor to attend to core business of project construction (Dainty *et al.*, 2001).

According to Mayhew and Quinlan (1997), the process of subdivision of contracts usually affects both the task performance and the employment status of workers.Consequently,the tasks performed in turn affect the structure, patterns of regulation and controls at the workplace(Wells, 2007). The returns due to main contractors are increased by subcontractors working many hours on tight deadlines, and avoiding safety measures during the course of their work which in turn may compromise H&S performance.

With increased specialization in the construction industry and consequent growth of subcontracting, non-observance of safety may worsen and adversely affect H&S concerns in construction sector (Musonda, 2012).

This chapter points out the flaws of informality found in informal subcontracting and how they affect H&S performance in construction projects. The literature reviews the organization of the Kenyan construction industry, informal provisions in sub contract arrangements, role of regulatory bodies and organization challenges of informal subcontractors and H&S performance on construction projects.

2.1 ORGANIZATION OF CONSTRUCTION INDUSTRY IN KENYA

The construction industry is largely differentiated on process and participation. There is a separation from design and production (Muinde, 2012). In construction the actual production unit is the site works, which operates as a temporary factory as compared to manufacturing concerns. The design team consists of the various consultants, namely Architects, Engineers, and Quantity Surveyors etc. The production side includes the main contractor (MC) and subcontractors (Shirazi *et al*,2010). The structure of organization at the project site starts with the client as the employer who contracts the various actors to realize the constructed product as summarized in figure 2.1 below: -

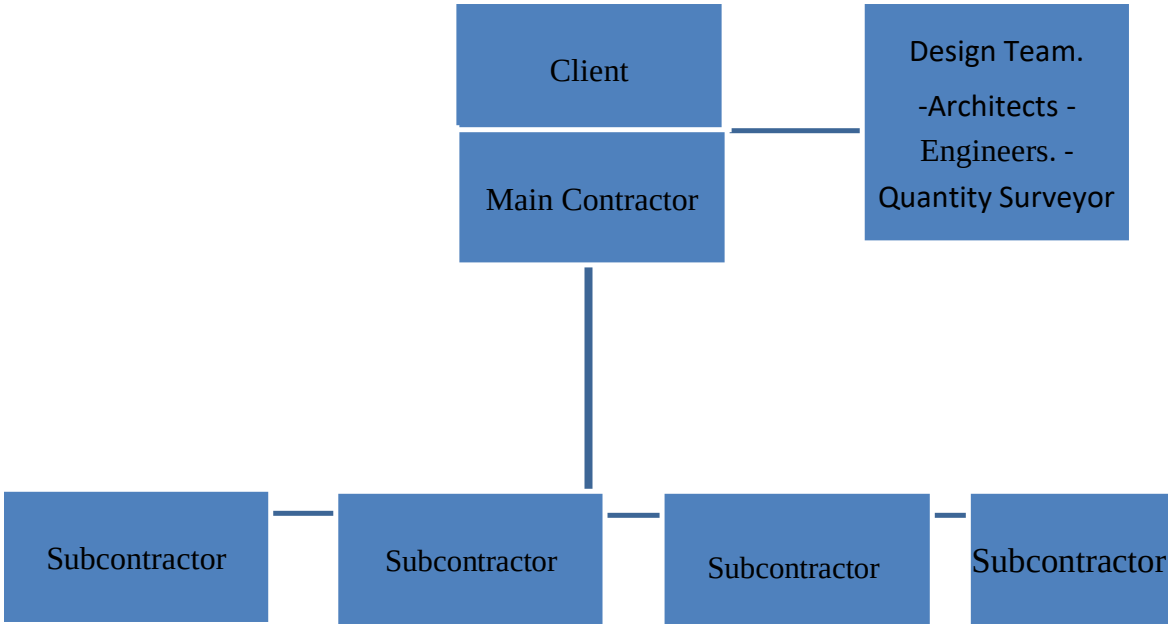

Figure 2.1: Typical project organization structure in Kenyan construction industry

Source: Shirazi *et al*, 2010

2.1.1 MANAGEMENT CONTRACTING

The onset of large – scale projects in Kenya mostly with input from multi funding arrangements has brought a shift to management contracting. Projects on tight contract

completion periods, requiring an early start on site, are procured even before the designs are finalized. According to Gehr (2013) this trend of work execution has brought in Management contractors avoid any construction work, but manage the projects on behalf of the client. The management contractor manages work/ specialist contractors and is paid management fees. This contracting arrangement is formal and H&S attributes are well incorporated in the contracts. Management contracting is a somewhat flatter process than the normal contractor matrices either under a design and build form or a traditional form of contracting (Bailey, 2013).Management contracting structure is summarized in Figure 2.2 below: -

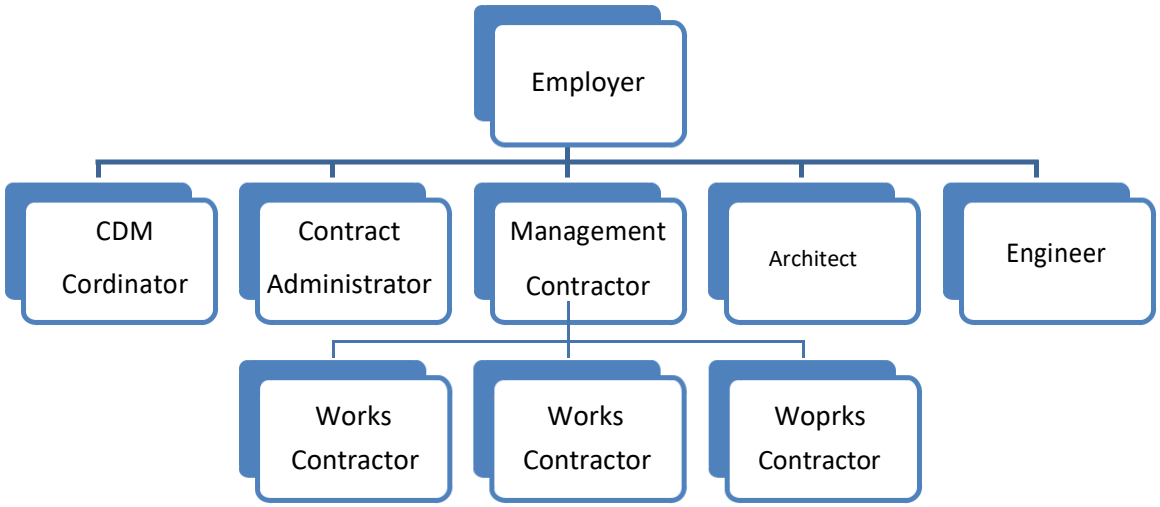

Figure 2.2: Organization of management contracting – the JCT

Source: Bailey, 2013

2.1.2 TYPES OF SUBCONTRACTORS

According to Muinde (2012), there are three types of subcontractors widely used in Kenya, namely:

i.) Domestic subcontractors

They are formal in-house contractors appointed and supervised by the main contractor. A direct contract is formed between the subcontractor and the main contractor and the consent of the employer is all that is required under the agreed contractual terms. The main contractor underwrites all the risks emanating from the domestic subcontractor and remains fully accountable to the employer.

ii.) Nominated subcontractors

They are formal subcontractors appointed and employed by the client or the Architect on behalf of the client to enter into contract with the main contractor to perform Specialist's works in the project. The use of a nominated subcontractor enables the employer to select competent subcontractors at a fair bid price.

iii.) Labour –only subcontractors

Labour-only subcontractors are selected and employed by the main contractor to provide labour for some particular sections of work such as masonry, painting, plastering, roofing etc.

Irrespective of the subcontractor's category, the MC the responsibility of good health and safety performance at the project site remains one of his duties and must absolve the employer from any accruing risks emanating from operatives at the site. However, during the subcontracting exercise there is a tendency for informal recruitment of labour by either the MC or the subcontractor to increase numbers of operatives at lower costs hence introducing informal sub-contractual relationships which have no bearing to good health and safety practices on construction sites.

2.1.3 SUBCONTRACTING-DEFINITION

The contracting system employed defines the type of subcontracting applied in each project. Broadly there is management contracting and institutionalized contracting. In Kenya institutionalized contracting is more prevalent and has been defined as a business relationship where one entity, the MC engages another independent entity, the subcontractor or supplier, to perform the production or carry out the processing of a material, component, part, sub-assembly or the provision of an industrial service in accordance with the main contractor's specifications (UNIDO, 2003). According to Webster et al (1997 the practice of subcontracting is an arrangement where a sub-contractor (i.e., an organization with unrelated business objectives from those of the MC) performs all or part of the process of the principal's product, as provided by the main contractor's customized requirements.

On the other hand, Gubik (2005) defines subcontracting as a business engagement between two unrelated parties and characterized by dual relationship, e.g., substitution (the subcontractor underwrites the responsibility risk of the MC) and subordination (the sub-contractor accepting the partner's instructions). A sub-contractor's business is different from others since his products are subset of the process contributing to the final product (Gubik ,2005).

2.2 PROVISIONS OF H&S IN INFORMAL SUBCONTRACTING

Formal subcontracting contracts are legal and relationships with main contractors are well outlined in contract documents. Not so with informal subcontracting where legal documentation is usually absent and many details of contract touching on health and safety scanty (Muinde,2012). Usually, main contractors deal with intermediaries who play the role of subcontractors in basic trades and labour contracting. Whereas in formal subcontracting the element of health and safety is observed due to its specialist in nature,

the same cannot hold true in the informal setups of construction. The relationships between the parties do not regard H&S as important because of low margins of income and lack of training on proper site safety. This low level of H&S provisions in informal subcontracting eventually impacts safety performance in the built-up sector in adverse manner. The type of contractual relationship in informal subcontracting, will depend with the roles carried out by the workers, intermediaries and contractors.

2.2.1 THE ROLE OF INTERMEDIARIES IN INFORMAL SUBCONTRACTING

The main function of an intermediary or labour subcontractor as evidenced by Vaid (1999) is that of recruiting labour when required and releasing it at project closure. In India, Nepal, and other developing countries, the intermediary is usually identified as a labour broker. The allocation of duties and the types of renumeration vary. There are cases where, the operatives are paid a daily rate, by the contractors with the broker drawing a commission for recruitment services only (Vaid ,1999). This arrangement as elaborated by Jha (2002), is popular in Nepal, as brokers can gain out of the commissions on the wages of the labourers irrespective of additional responsibility of supervising them. In other instances, the intermediary may take on extra responsibilities by managing the building works and advising on materials. The contractor or developer pays the workers directly, with separate compensation in form of fees to the intermediary (Jha 2002). Complete outsourcing happens where intermediaries receive deposits for doing tasks, which form part payment to the hired workers, while taking his commission as profit (Vaid ,1999). The actual description of this arrangement is a labour-only subcontracting. According to English (2002), there is a lot of informality in the arrangements of recruiting the brokers and the site workers in both cases, because budgets for safety gears and safe operations which leads to non-performance of H&S in project sites are usually not factored.

Like Nepal, many of the site operatives found in Nairobi City County are usually recent unskilled migrants from the countryside and the urban poor (Vaid, 1999). Construction gangs in these cities are sustained in the urban economy through communal linkages that play key roles in recruitment and accommodation of workers as they work in the construction projects as summarized in Figure 2.3.

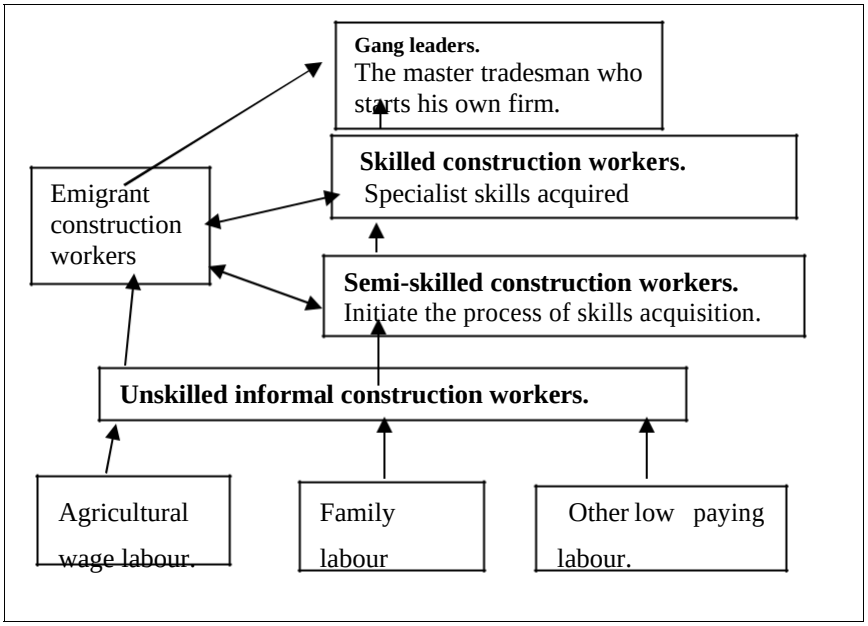

Figure 2.3: Status of Construction Workers in Nepal

Source: Adapted from Jha, 2002

Construction work groups are recruited through referrals in Nairobi, and workers often share same geographical area and a common language. They are daily/temporary workers recruited by leaders/supervisors and absorbed by main contractors/subcontractors as in-house employees. The leaders are former employees of formal construction firms and have supervisory role over the gangs, and operate informally as subcontractors, with no

contract documentation hence compromising H&S performance at construction sites (Mitullah and Wachira, 2003).

2.3 COMPLIANCE OF OSH ACT 2007 BY INFORMAL SUBCONTRACTORS

The Occupational Safety and Health Act, 2007 (OSHA 2007) was enacted by Parliament to provide for the welfare of workers in all matters of health and safety within Kenya. OSHA 2007, is domiciled in the Ministry of Labour and Social Protection, and operationalized by the Directorate of Occupational Safety and Health Services (DOSHS). The Directorate carries out registration of workplaces, regulates and enforces H&S in the workplaces including the construction industry (OSHA, 2007).

The OSHA 2007 has health and safety provisions which were investigated in this study and are usually contravened by informal subcontracting such as: -

1.Training and supervision of inexperienced workers

The OSH Act (2007) section 99, states that no person shall be employed at any machine or in any process, liable to cause ill health or bodily injury, unless he has been fully instructed as to the dangers likely to arise in connection therewith and the precautions to be observed. The Director ensures inexperienced workers have sufficient apprentice training in machine operations and are adequately supervised by knowledgeable persons with requisite experience of plant processes (OSHA, 2007).

2. Personal Protective Equipment (PPEs)

Part XI section 101 of the OSH Act (2007), regulates employers to provide and maintain adequate suitable protective clothes and appliances e.g. suitable gloves, footwear, goggles and head coverings for use in workplaces where employees are involved in any process of work, exposure to wet or to any injurious or offensive substance. Registration of safety consultants shall be done by the Director to assess the suitability and effectiveness of PPEs (OSHA, 2007).

3.Preservation of registers and records

The OSH Act (2007) Part XIV section 123 opines that all registers and records kept in pursuance of this Act shall be preserved and kept available for inspection by any DOSHS officer for at least three years, or such other period as may be prescribed after the date of the last entry in the register or record. The Director shall enforce regulations prescribing how records are kept and provision of employers and workers in making returns. (OSHA, 2007).

4.Approval of plans of workplace premises

The OSH Act (2007) Part XIV, section 125 prescribes those buildings shall not be erected or converted as workplaces neither structural alteration nor extension shall be allowed except in conformity with detailed drawings showing the proposed construction/ alteration as per the Director's approval (OSHA, 2007).

5.Safety and Health regulations

The OSH Act (2007) Part XIV, section 127 provides guidelines on prohibition, prevention and how to minimize exposure to hazard. The Director enforces H&S of persons at work , plant or machinery usage, and protection of third parties against risks arising from workplace activities of persons at work that may be adverse to health and safety (OSHA, 2007). The Director also oversees the works of the entire project cycle, maintenance and demolition of buildings. Other responsibilities of the Directorate include the restriction on storage and use of explosives or dangerous substances(OSHA, 2007).

Rawlinson (2004), points out the three approaches of formal management of H&S in the building subsector namely from: -

i. Legal standpoint , where abiding by rules and regulations of the workplace is required as contained in OSHA of 2007.
ii. The socio-humanitarian aspects which touch on human lives involved,
iii. The financial-economic aspects of high accidents insurance claims.

It is the absence of these three pillars of safety management which differentiates informal subcontractors from their formal peers (Levitt and Samuelsson, 1987). In an environment of informality as evidenced in Kenya, the use of informal subcontractors as in-house employees results in: -

2.3.1 NON- ADHERENCE TO AUTHORIZED SAFETY POLICY

While health and safety policy documents can be found in many construction firms, commitment to adhere to the regulations is applied selectively to the core workers and day/temporary workers left to bear the brunt of safety risks (Wells, 2007). Without enforcement of safety regulations, it's difficult to provide good working environments at the building sites (CSAO, 1993). Koehn et al. (1995) argue that absence of support for safety management programs, is a clear indication of informality and increases the number of site accidents, and becomes quite costly to the contractor and subcontractor respectively. In Kenya, registration and approval levies are charged for the building plan to be used at the workplace. These levies are part of the reasons why some contractors fail to register their workplaces and default in following regulations of H&S in construction sites (OSHA, 2007).

2.3.2 ORGANISATION OF SAFETY MANAGEMENT

One of the characteristics of informal subcontractors is lack of safety management programs in the areas of allocation of responsibilities and accountabilities to personnel involved in implementating construction safety programs (Rawlinson ,2004). Monitoring work is non-existent hence: -

(i) Policy implementation and demonstration of accountabilities is not done.

(ii) There are no functions of safety committees and safety representatives.

(iii)There are no individual job descriptions and how they reflect on health and safety responsibilities (Stranks, 2000).

There is usually no active commitment from both management and employees for site safety concerns (Holt, 2001). Sawacha et al. (1999), affirms that lack of a competent, full-time safety official on site compromises safety performance as there is no fault spotting and corrective action cannot be done on timely manner.

2.3.3 DEFICIENCIES IN PLANNING AND IMPLEMENTATION OF SAFETY

Enforcement of a safety program requires planning and proper controls in order to be effective (Goldsmith, 1987). Deficient planning as observed in informal subcontracting is incapable of resolving H&S concerns efficiently at workplace. (CSAO, 1993). Without proper planning, identifying attainable, relevant objectives and targets becomes difficult to all site personnel and other people who may be affected by the construction processes (Holt, 2001). Lack of approved safety procedures will hinder accident investigation, analysis of hazards at work, promotion of safety and use of protective clothing etc (Holt, 2001).

2.3.4 ABSENCE OF MEASUREMENT OF SAFETY PERFORMANCES

Informal subcontractors do not observe safety performance measures and are unable to pinpoint problem areas among themselves and between their supervisors (Levitt and Samuelsson, 1987). The control and improvement of any performance aspect on site has the ability to measure safety performances as a method in choosing a contractor, a criterion yet to be embraced by informal subcontractors. The various methods of measuring safety performances such as experience modification rating (EMR), accident costs, frequency rate, behaviour-based safety and OSHA-recordable incidence rates are usually absent in informal subcontracting set ups (Holt, 2001).

2.4 COMPLIANCE OF NCA ACT 2011 BY INFORMAL SUBCONTRACTORS

The NCA is a public corporation within the Ministry of Transport, Infrastructure, Housing and Urban Development and was formed by the National Construction Authority Act

2011(G.O.K,2012).The NCA was assented to on 2nd December, 2011 and operationalized on 8th June, 2012. It was formed with the main aim of consolidating and creating a well-regulated construction industry that would promote sustainable socio-economic development (G.O.K, 2012).

To establish the extent of compliance of NCA Act 2011 by informal subcontractors, the provisions of enforcement investigated in this study were: -

1.Investigation of a complaint or suspicion

a) NCA may upon receipt of complaints from aggrieved persons under the terms of the code of conduct by an action or an omission taken or where it has adequate grounds to determine that a person has violated or has omitted to act in terms of the code of conduct, NCA shall constitute a subcommittee to carry out an investigation into such complaint or suspicion (G.O.K, 2012).

b).The investigating subcommittee shall conduct the investigation within the time stipulated by the NCA and submit its report and recommendation for sanctions where appropriate.

c).A person subject to investigation under this regulation shall be entitled to appear before the subcommittee in person or through an advocate

d).Suspension of a registered contractor shall be affected after completion of investigations confirm that a misconduct was carried out (G.O.K, 2012).

e).An investigating committee may make recommendation with respect to the contractor including revocation of the registration caution or censure.

f).Any contractor whose licence is suspended shall not enter into any new contractor until the suspension has been lifted

2.Removal from the register

Removal of a contractor from the register shall be affected by NCA

if the contractor:-

i) Has been debarred from participating in a procurement process under any legislation.

ii) Has been found guilty of non-compliance with the Code of Conduct published under the Act.

iii) Fails to comply with the provisions of Regulation 27 with regard to settlement of fees.

iv) Is declared bankrupt or

v) Company ceases to exist as a legal entity.

2.4.1 THE CHALLENGES OF ENFORCING NCA ACT

The challenges of enforcement have weakened NCA in its role of regulating contractors in the construction industry. These challenges have not adequately solved the issue of informal subcontracting. According to Gacheru and Diang'a (2015) informal contracts abound because of high registration fees and construction levies pegged on projects. Other weaknesses on the part of NCA which have not prevented informality in the building sub sector include: -

i. Attitude of contractors towards NCA. Low levels of compliance can be attributed to contractors' failure to renew their licenses, and impunity.

ii. Inadequate human resource to ensure compliance of building regulations, results in NCA presence being thin on the ground. Adequate personnel are required to enforce building regulations to avert informalities which precede H&S occurrences.

iii. Corruption- creation of new methods of concealing non-compliance. Certification of projects without due diligence by the regulator

iv. Overlapping regulatory responsibility with other bodies, burdens the contractors because of duplication of roles. This duplication creates a lacuna

for contractors to avoid responsibility in case a mishap occurs on a construction site.

The intent of the NCA Act is noble if the weaknesses of enforcement are corrected and prosecutorial functions are extended to them. Without empowering NCA adequately with funding and legal framework to prosecute errant contractors it will be a challenge to eradicate informality in the building sector, which in turn has exacerbated H&S performance in construction projects (Gacheru & Diang'a,2015).

2.4.2 ROLE OF NCA IN THE CONSTRUCTION INDUSTRY

Statutory guidelines are building regulations put in place to check that the building by-laws domiciled in relevant legislations are upheld (Gelder, 2004). Globally, every country has building regulation authorities established to carry out the following functions: -

i. Streamline contradicting construction laws found in statutes.
ii. Restrict haphazard physical planning of built-up environment.
iii. Enforce the use of the Building Code in the building subsector,
iv. Restrict unqualified contractors from entering into the construction industry.
v. Reduce bureaucratic requirements and approval procedures.

Approval of workplaces as per OSH Act is normally pegged to prior approval by other agencies namely Town planning departments of county governments, NEMA, and National Construction Authority (NCA), each with their respective fees and inspection demands. NCA approval is usually the last regulatory requirement in the approval chain. These chains of approvals are usually avoided by many actors in the construction sector (Gacheru and Diang'a, 2015). Its avoidance of these approvals that contractors adopt informal sub-contracting arrangements hence compromising health and safety performance at construction sites.

2.4.3 SUBCONTRACTING PRACTICE IN HONG KONG CONSTRUCTION INDUSTRY

According to Wong (1999), multi-layer subcontracting system, has been linked to the high accident rate in Hong Kong construction industry (Lee ,1996).

Lai (1991) found that the number of subcontractors were as high as twenty in some construction sites. The main contractors' work force in projects were usually small, and this limited adequate supervision of subcontractors' site workers. Safety management was cited as a challenge in terms of project feedback and supervision. Lee (1999b) observed that multi-layer subcontracting was widely used in Hong Kong. Rowlinson (1999) found in his study that subcontractors' semi-skilled workers with less awareness of safe working practice accounted for 84% of site operatives injured from 1995 to 1998 as recorded in Hong Kong Housing Authority. The underlying difference between the Hong Kong subcontracting practice is on the quality of training. They have semi-skilled to very skilled labour while in Kenya unskilled labour is still found in many construction projects, brought on board informally to cut on overhead construction costs.

2.4.4 SUBCONTRACTING PRACTICE IN KENYA CONSTRUCTION INDUSTRY

The decline in the formal economy as pointed out by Wachira *et al.* (2007) has mainly affected the building subsector and as a result there is a trend in the casualization of operatives, whereby informality of the industry is now largely in the hands of informal subcontractors. It is argued by Wells (2007) that the absence of regulation begets informality. The absence of regulation affects four key areas namely: -

i) Regulation of informal sector of enterprises.

ii) The terms of engagement for employment of informal labour.

iii) Sequence of construction -informal construction system

iv) The end product-informal building/settlements.

Informal subcontracting in Kenya works on informal procurement of materials and labour. In informal procurement, the clients, in absence of the general contractor, takes on the general contractor's responsibility and risk of managing the construction process that is buying the Materials/components, recruiting the labour, integrating all the resources on site to ensure efficiency, etc. The client will thus purchase all the materials and components necessary and informally engage self-employed artisans directly to complete the builder's works (Wells,2001). Materials for the relevant stage of construction are purchased in varying amounts as dictated by the availability of funds.

For instance, construction of walls will be determined by availability of materials and so is the corresponding workforce. Construction will proceed in this manner until the project is accomplished. The consequence of this informal procurement system has enhanced the decline in institutional training of craftsmen in construction skills and site safety (Wells, 2001).

Multi-layer subcontracting occurs when there are several tiers down the supply chain in the contract as is the case in Hong Kong. In the Kenyan context multi-layer subcontracting usually gravitate to informal subcontracting, where subcontracts have little or no legal backing (Wells, 2007). The Kenyan construction industry needs to upscale training of the operatives and have well documented subcontracts.

2.5 ORGANISATION CHALLENGES OF INFORMAL SUBCONTRACTORS

The extent of compliance challenges as stipulated in OSH Act 2007, by informal subcontractors can be attributed to organisation challenges from other actors in the construction projects as summarized in the relationship chart below: -

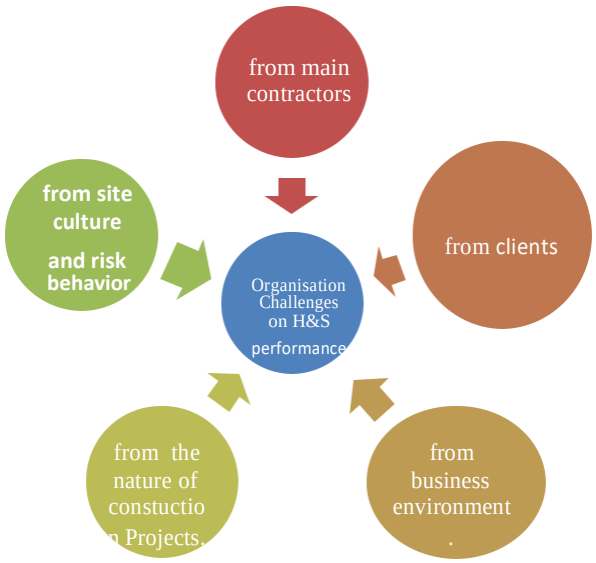

Figure 2.4: Organisation challenges of Informal Subcontractors

Source: Kheni *et al*, 2005

2.5.1 ORGANISATION CHALLENGES FROM CLIENTS

Clients have influence on construction projects because they can influence positive safety culture and vice versa by drawing contracts which rein in errant conduct from main contractors. However, the practice is that many clients do not factor for supervision services hence compromising quality and safety on construction sites, especially with subcontractors engaged informally. The latest requirement in the public sector that 30% government procurement opportunities be set aside for women, youth and persons with disability has increased small subcontractors who are ill equipped to handle H&S issues at construction sites (KNBS, 2015).

2.5.2 ORGANISATION CHALLENGES FROM MAIN CONTRACTORS

Main contractors and subcontractors usually have adversarial relationship and lacks trust between them. Disputes on safety responsibilities become apparent when contractors sign

informal contractual agreements which are silent on H& S provisions. Silence on H& S provisions demotivates subcontractors who in turn pass the 'frustration' to the workers and compromise the welfare of the site operatives thereby compromising H&S performance of the project (Hinze and Tracy, 1994).

2.5.3 ORGANISATION CHALLENGES FROM BUSINESS ENVIRONMENT

i. Administrative Compliance: - Many subcontractors contracted informally as underscored by (Muinde 2012) are under resourced with competent operatives and lack management skills of keeping records of their work besides being unable to handle complex site and safety tasks. Poor management impedes awareness of a successful business strategy, affecting key areas of marketing, pricing and financial control (De Valence, 1994).

ii. Financial constraints: - Poor cash flow and failure to get credit lines from financiers is a major hindrance to subcontractors because of inability to purchase PPEs and irregular remittance to the Occupational Safety and Health Fund to cover for training for their workers.

iii. Corruption: - Payments of bribes increases the cost of doing work and also makes enforcement of H&S audits by the requisite agency difficult.

2.5.4 ORGANISATION CHALLENGES FROM SITE CULTURE AND RISK BEHAVIOUR

Cultural constructs shape (Adams 2006) individuals' attitude towards risk. An environment of informality only worsens safety and health performance at the site through untested working culture (Wells, 2007). An unskilled site operative (Sarkar 2017) is one who does simplified duties, requiring little experience of or no independent judgment although occupational safety experience is necessary (Choudhry and Fang 2008). A semi-skilled worker generally does repetitive work, requiring little judgment and skill (Cipolla *et al.* 2006). Proper discharge of duties assigned to him are narrowed and decisions of

importance are cascaded down to him. His role is restricted to accomplishment of controlled scope for operatives paid on price or measure, on stringent time limits resulting to cutting corners, like dressing inappropriately at site (Spanswick,2007). Similarly, operatives often take risks simply to get the job done, for money or just to keep their employment secure (HSE 2003; Langford *et al.* 2000).

2.5.5 ORGANISATION CHALLENGES FROM NATURE OF CONSTRUCTION PROJECTS

Construction projects are temporary in nature and level of preparedness varies from one project to another. The OSH Act has guidelines on how chemical and other risky- related projects are to be handled. There are also other construction projects which require stringent safety measures, like high rise buildings and renewal projects. Unskilled workers brought on board through informal subcontracting endangers not only the safety of formal workers on site but also other third parties (Ofori, 2015).

2.6 CONCEPTUAL FRAMEWORK

Conceptual framework represents a research synthesis either graphical or in narrative form, showing the variables under research investigation according to the specific study objectives (McGaghie *et al*.,2001).The synthesis of the research outlines the link between independent variables and dependent variables as summarized in Figure 2.5

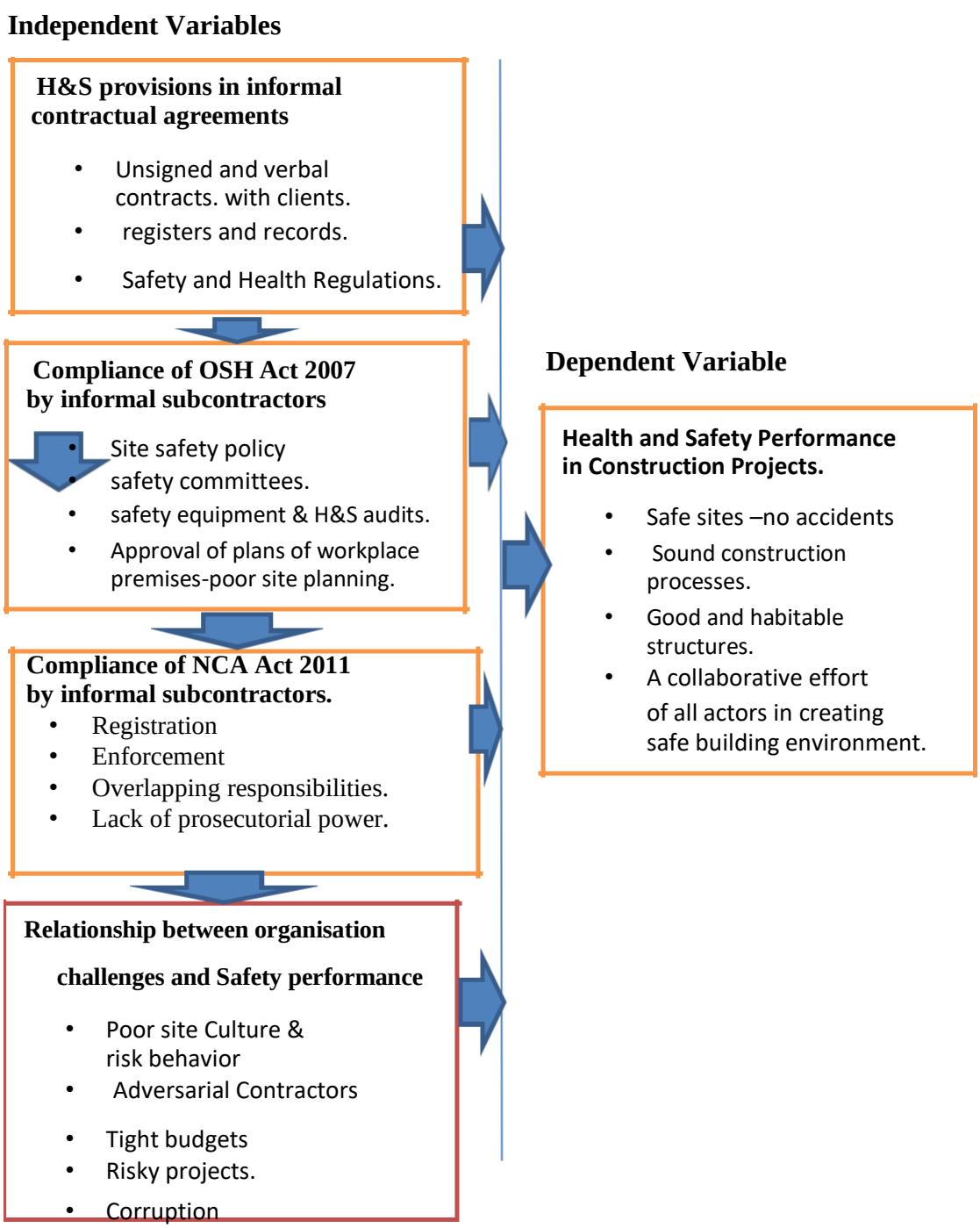

Figure 2.5: Conceptual Framework

Source: Author, 2019.

2.7 SUMMARY OF LITERATURE REVIEW

Informality in the construction industry sub- sector is part of the growing informal economy of Kenya today. As a result, a subcontracting culture devoid of regulation has emerged. Health and Safety practices are kept to the minimum, safety management systems are absent and measuring H&S performance made inconsistent. The subcontracting practice in the building sector is both formal and informal with the latter gaining currency due to multiplicity of factors like corruption, incompetency on the part of construction actors and weak enforcement structures by the government agencies.

Operational compliance challenges brought by informal subcontracting have entrenched informality as evidenced by the number of collapsing buildings either under construction or inhabited buildings. Health and safety are the last parameters to be observed during engagement of the construction actors and subsequent construction of the built environment.

As long as informality is construed as inferior to other practices then the challenges of informal subcontracting will remain in the construction industry. The choice for informal subcontracting should be accompanied by deliberate supportive structures so that we do not compromise H& S in construction projects. These supportive structures should cut across the entire construction sub-sector value chain, from land acquisition, financing, training in construction, site safety skills and friendly regulatory framework.

2.8 CONCLUSION

This literature review investigated the influence of informality in subcontracting and its effects on H&S performance on construction projects. Relevant content was sed to guide the study. The next chapter dealt on research and methodology.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.0 INTRODUCTION

Research methodologies are instruments for research that provide guidance from general assumptions to detailed methods of data collection, analysis, and interpretation (Creswell, 2014). The chapter had various sections organized from research design, target population, sample size, sampling procedures and data collection method (Creswell, 2014). The research had checks on reliability and validity of data collection**,** analysis and presentation methods (Kothari, 2004). Issues of Ethics have become very important in protecting integrity in research processes as this study was geared in giving the audience authentic work.

3.1 RESEARCH DESIGN

A research design is the outline of conditions for collection and analysis of data in a way that aims to combine relevance and economy to the research purpose (Kothari, 2004). The study used mixed method of descriptive and qualitative survey research to achieve the research objectives. Creswell and Clark (2007) argue that, descriptive study gives a pre-determined, quantitative or numeric test by examining correlation among variables through objective theories.

Subsequently the variables provide quantitative or numeric description of opinions of a population through analysis of samples of that population(Creswell, 2014). Being exploratory, qualitative research is useful in interrogating emerging trends of informality found in the Kenyan construction industry. There is need to explore informal subcontract samples which tend to be open-ended without predetermined responses which according to Morse (1991) are not covered in existing theories and quantitative measures may not be suited to this kind of phenomenon. Quantification of site accidents and incidents

combined with reasons behind the lapses in performance of H&S found in construction projects, underscore the importance of using a mixed method of inquiry.

3.2 TARGET POPULATION

The total group of subjects that meet a designated set of criteria, forms the population in research under study . Polit and Hungler (1999) distinguish between the target population and the accessible population. The target population includes all the cases about which the researcher would like to make generalizations. The accessible population comprises all the cases that conform to the designated criteria and are accessible to the researcher as a pool of subjects for study (Polit and Hungler,1999). The target population in this study comprised of construction firms doing business in Nairobi. Constructions firms in Kenya are categorized in terms of maximum value of work they are allowed to do as summarized in Table 3.1 below: -

Table 3.1: Maximum value of work allowable to contractors

Category/Class	Building Contractors Max value of project [Kes`]	Specialist Contractors Max value of project [Kes]
NCA1	Unlimited	Unlimited
NCA2	500,000,000.	250,000,000
NCA3	300,000,000	150,000,000
NCA4	200,000,000	100,000,000
NCA5	100,000,000	50,000,000
NCA6	50,000,000	20,000,000
NCA7	20,000,000	10,000,000
NCA8	10,000,000	5,000,000

Source: Gazette Notice No. 7528 Vol. CXXI—No. 101 Nairobi, 9th August, 2019 NCA

The number of registered building contractors was 3331 for building and 1055 for specialist contractors respectively as summarized in Tables 3.2 and 3.3.

Table 3.2: Registered building contractors as at 9th August, 2019-Nairobi County

Category of Registration.	NCA.1	NCA.2	NCA.3	NCA.4	NCA.5	NCA.6	NCA.7	NCA.8	TOTAL
Number of contractors in category	**147**	**97**	**152**	**401**	**424**	**817**	**931**	**362**	**3331**

Source: Gazette Notice No. 7528 Vol. CXXI—No. 101 Nairobi, 9th August, 2019 NCA

Table 3.3: Registered specialist contractors as at 9th August, 2019-Nairobi County

Category of Registration.	NCA.1	NCA.2	NCA.3	NCA.4	NCA.5	NCA.6	NCA.7	NCA8.	TOTAL
Number of contractor's category	**117**	**30**	**51**	**166**	**149**	**279**	**209**	**54**	**1055**

Source: Gazette Notice No. 7528 Vol. CXXI—No. 101 Nairobi, 9th August, 2019 NCA
Registered contractors whether building or specialist are formal and usually subcontract works to labour contractors/subcontractors or to craftsmen who may not have requisite skills as per National Construction Authority (NCA) regulations, 2011. The labour is contracted as employees of main contractors/subcontractors with no or little formal engagements. Tracing informality in formal constructions firms and its effect on H&S was the study objective in this research. The number of unskilled and semi-skilled workers in the construction subsector was 171600 in the year 2018 (KNBS, 2019).

3.3 SAMPLE SIZE AND SAMPLING PROCEDURES

Sampling is the process of selecting part of the population to represent the whole population (Polit and Hungler, 1999). Stratified sampling is a commonly used probability method which reduces the sampling error (Kothari,2004). In this study, sampling of the population for the building and specialist contractors were stratified separately. Each stratum formed a subpopulation and had 8 strata from category NCA 1 to NCA8. A

stratum is a subset of the population that shares at least one common characteristic. In this research, the strata were the categories of registration for the contractors by the National Construction Authority.

3.3.1 DISPROPORTIONATE STRATIFIED SAMPLING

Disproportionate stratified sampling is a stratified sampling procedure in which the number of elements sampled from each stratum is not proportional to their representation in the total population (Gupta, 2015). Population elements are not given an equal chance to be included in the sample (Piazza, 2010). This unproportioned representation in the total population prompted the use of disproportionate stratified sampling as the preferred method of sampling. To maximize precision, a stratified sample, consisting two strata of building contractors and specialist contractors was used (Creswell, 2014). In both cases the strata were different not only in size but also in variability. From this foregoing, optimal allocation method was used, to place more (than proportionate) cases to those strata with relatively high variability in the primary variable in the research (Piazza, 2010). According to Gupta, (2015) disproportionate sampling design is used to account for differences both in stratum size and stratum variability which requires that: -

$$n1/N1\ \ 1 = n2\ /N2\ \ 2 = \ldots\ldots\ldots = nk\ /Nk\ \ k$$

Where1, 2, ... and *k* denote the standard deviations of the *k* strata, *N*1, *N*2,, Nk denote the sizes of the *k* strata.
and *n*1, *n*2,, *nk* denote the sample sizes of *k* strata.

A sample size calculator derived a sample size of 354 based on a total population of 4386. However due to a downturn in the economy a workable sample size of 96 contractors was taken. This sample allocation plan as argued by Piazza, (2010) provides the most precision by assuming that the direct cost to sample an individual element is equal across strata. The allocation in such a situation results in the following formula for determining the sample sizes in different strata: -

$$i = \frac{n \times Ni\ Si.}{}$$

$$N_1 S_1 + N_2 S_{2\ldots} + N_k S_k$$

Where i=1, 2, and k.

n= denote the sample sizes of *k* strata.

N1, N2 = Nk denote the sizes of the *k* strata.

S*1*, S2 is standard deviation of sample

*n*1= Specialist Contractors. – 96 * 1055*7.04/ [(1055*7.04) + (3331*14.2)] =13.

*n*2= Building Contractors. - 96*3331*14.2/ [(1055*7.04) + (3331*14.2)] =83.

In order to randomly choose the sample, the contractors were listed alphabetically in their respective categories. The optimal allocation for building and specialist contractors as summarized in Table 3.4. below: -

Table 3.4: Optimal allocation for building and specialist contractors.

Stratum	**Population Size-*N***	**Allocated Sample Size**	**Mean size per Category**	**Standard deviation.** $S = \sqrt{\frac{\Sigma(X - \overline{X})^2}{N}}$ where S = the standard deviation of a sample, Σ means "sum of ", X = each value in the data set, $\overline{X}$ = mean of all values in the data set, N = number of values in the data set.
Specialist contractors. - *N*1	1055	13	132	**s 1**=7.04
Building contractors. - *N*2	3331	83	416	**s 2**=14.2
Total	4386	96	-	-

Source: Field Survey, 2019

This optimal allocation and selection criteria were further cascaded down to the respective strata for building and specialist contractors as summarized in Tables 3.5 and 3.6 respectively.

Table 3.5: Specialist contractors disproportionate stratified sampling

	Stratum	Population Size (N_1			
		Frequency	Percentage	Sample Size	Selection Criteria (For every N_1th firm)
1	NCA 1	117	11.1%	1	117th firm
2	NCA 2	30	2.8%	-	-
3	NCA 3	51	4.8%	-	-
4	NCA 4	166	15.7%	2	83rd firm
5	NCA 5	149	14.2%	2	75th firm
6	NCA 6	279	26.4%	5	55th firm
7	NCA 7	209	19.8%	3	69th firm
8	NCA 8	54	5.2%	-	
	TOTAL	1055	100%	13	

Source: Field Survey, 2019

Table 3.6: Building contractors disproportionate stratified sampling

	Stratum	Population Size (N_2)			Selection Criteria
		Frequency	Percentage	Sample Size	(For every N_2th firm)
1	NCA 1	147	4.4%	4	36th firm
2	NCA 2	97	2.9%	2	48th firm
3	NCA 3	152	4.6%	4	38th firm
4	NCA 4	401	12.0%	10	40th firm
5	NCA 5	424	12.7%	11	38th firm
6	NCA 6	817	24.6%	20	40th firm
7	NCA 7	931	27.9%	23	40th firm
8	NCA 8	362	10.9%	9	40th firm
	TOTAL	3331	100%	83	

Source: Field Survey, 2019

3.4 DATA SOURCES AND COLLECTION METHODS

Through the use of structured interviews and questionnaires, it was possible to get primary data. Published materials e.g journals, books and official statistics from regulatory agencies with content material related to the study were used as secondary data (Creswell, 2013). Using qualitative observation, site behaviour and activities of operatives at survey sites, were recorded based on unstructured and semi structured open-ended questions that enabled the respondents to freely provide feedback which was useful for the study (Creswell, 2013). Qualitative structured interviews were conducted using oral interviews with regulatory officials from their workplaces. Self-administered questionnaires were useful in collecting data for this study. The respondents answered the questions on their own as this method was found very cost effective (Kothari, 2004). The questionnaires were formulated with quantitative closed ended multiple-choice questions and qualitative open-ended questions, and mailed to the respondents for ease of communication. The respondents constituted site supervisors/managers and foremen in the construction sites of the sampled building construction firms due to their knowledge and experience in site operations. Introduction letters with explanation about the purpose of the study were attached to the questionnaires (see appendix I).

3.4.1 QUESTIONNAIRE DESIGN

Data from contractors was collected through in-depth questionnaires comprising of both Likert Scale (Very important to Not important) and open-ended questions (Creswell & Miller, 2000). Two sets of questionnaires were prepared for main contractors and specialist subcontractors while structured interviews were conducted for the policy makers namely NCA and OSHA. The first section for each set of questionnaires covered background information. This part investigated the respondent's personal and company profiles together with their practices (see appendix II).

The open-ended questions gave the respondents a chance to expound on their responses or even express their views or suggestions on certain aspects of the study. The respondents

were also contacted through the phone to establish their current location owing to the nature of their jobs and questionnaires were administered at construction sites. Those who were inaccessible were contacted by email. The data collection exercise was conducted between 10th September, 2019 and 15th October, 2019.

3.4.2 VALIDITY AND RELIABILITY OF DATA COLLECTION METHODS

Validity measures the strength of research, and determines the accuracy of the findings from different standpoints i.e from the researcher, respondents, or the audience of the study (Creswell & Miller, 2000). Validity of the data collection methods, was ensured by the use of easy to comprehend questions whose response had a correlation to the variables being investigated so as to achieve the purpose of the study.

Reliability indicates whether or not the research method used is consistent across different studies and projects. Data reliability of the collection instruments, was achieved by use of pre-tests, by randomly selecting ten (10) building construction firms and four (4) specialist construction firms. The researcher then presented the questionnaires and observed the response of the respondents to confirm the relevancy of the answers given on the study. Observed weaknesses in the data collection method were noted and amendments made (Creswell, 2013).

Internal consistency was measured using Cronbach's alpha statistic among a set of the six sources of organisation challenges as one composite variable (Gibbs, 2007). A Cronbach alpha of 0.61 was realised, confirming that the variables belonged to the same construct and were correlated. The commonality of informality was common in all the variables, posting a moderate level of reliability acceptable in social sciences, (Taber,2018).

3.4.3 ETHICAL CONSIDERATIONS

There were reasons why it was important for adherence to ethical practices in carrying out

this research. Firstly, best practices promote research goals, such as truth, knowledge, and avoidance of error (Resnik 2015). For instance, restrictions against misrepresentation of research data highlight the truth and reduce errors. Secondly, since research often involves a great deal of collaboration among many different people in different disciplines and institutions there should be ethical standards to promote the values that are essential to team work, such as trust, accountability, mutual respect, and fairness (Resnik 2015). To maintain dignity and privacy of the respondents the questionnaires were coded to hide their names. The research was conducted for the purpose of fulfilling academic requirements and not published for public consumption (see appendix).

3.5 DATA ANALYSIS AND PRESENTATION METHODS

Statistical analysis is a method, which involves mathematical interrogation and search for relationships between different sets of data (MacDonald and Headlam, 2009). The researcher used SPSS Version 20, a formal statistical package which not only allows use of a wider range of statistics but also easy to determine probable significant differences between groups (e.g., analysis of variance) and examine relationships among variables (e.g., correlation). Content analysis is used in quantitative and qualitative studies or in both as a combination, where it combines both the features of quantitative and qualitative studies (Hsieh & Shannon, 2005). It is a good tool because it determines psychological or emotional state of persons or groups. In addition, elaborate descriptions were identified depicting inferential statistics and qualitative data techniques used as per the nature of the phenomenon under study. The analysed results were presented in form of charts, graphs and tables for ease of understanding as summarized in Table 3.7.

Table 3.7: Operational Definition of Variables

The table below explains how the researcher went about measuring the inferences he indicated for the study.

Objective Design	Variables	Indicators	Measurement	Study
	Independent			
1. To identify the level H&S provisions in informal subcontracting	- Sub-contractual agreements	-unsigned or verbal contract agreements -lack of registers and records -Lack of Safety and Health Regulations.	-No site records	-Descriptive.
2. To establish the level of compliance of OSH Act 2007 by informal subcontractors	- OSH Act 2007	- Lack of Site safety - Lack of safety policy committees - Lack of safety equipment - Lack H&S audits.	-No of recorded accidents	-Descriptive
3. To establish the extent of Compliance of NCA Act 2011 by informal subcontractors.	- NCA Act 2011	-No registration -No enforcement -overlapping regulatory roles.	-No site records -abandoned sites.	-Descriptive
4. To examine whether or not there is a relationship between Organisation challenges of informal subcontractors and H&S performance on construction projects	- Organisation challenges	-inexperienced operative -risky projects -tight budgets	-No site records -unplanned sites	-Descriptive

Source: Author, 2019.

3.6 CONCLUSION

Chapter three focused on the methodology used in the study (Kothari, 2004). Defination of a mixed method (descriptive and qualitative) for data collection and analysis was covered in the chapter (Creswell and Clark, 2007). Measures followed during the data collection and the information about the sample was provided. Data analysis and discussion were presented in the next chapter as per the objectives of the study.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

4.0 INTRODUCTION

Presentation and analysis of data collected informed the focus of this chapter. The field survey investigated the influence of informal subcontracting and its effects on health and safety performance construction on projects. The specific study objectives of the research were: -

i) To identify the level of H&S provisions in informal subcontracting

ii) To establish the level of compliance of OSH Act 2007 by informal subcontractors.

iii)To establish the extent of compliance of NCA Act 2011 by informal subcontractors.

iv)To examine whether or not there is a relationship between organisation challenges of informal subcontractors and H&S performance on construction projects

4.1 RESPONSE RATE

Building contractors in Nairobi County were issued with a sample of 83 questionnaires out of which 51 questionnaires were returned and analysed providing a response rate of 61.44% . The results are summarized in Table 4.1 below: -

Table 4.1: Response rate of building contractors

NCA- Group.	Sample size	Responses	Response rate (%)
1 & 2	6	4	66.66
3 & 4	14	9	64.28
5 & 6	31	18	58.06
7 & 8	32	20	62.50
Total	**83**	**51**	**61.44**

Source: Field Survey, 2019

A sample of 13 questionnaires were issued out to specialist contractors in Nairobi City County and 10 questionnaires were returned and analysed with a rate of 76.92% as response. A responsivity of 70% is adequate (Mugenda and Mugenda 2003), therefore a responsivity of 76.92% for specialised contractors was considered to be representative of the target population as stipulated in Table 4.2 below: -

Table 4.2: Response rate of specialist contractors

NCA- Group.	Sample size	Responses	Response rate (%)
1 & 2	1	1	100
3 & 4	2	2	100
5 & 6	7	5	71.43
7 & 8	3	2	66.67
Total	**13**	**10**	**76.92**

Source: Field Survey, 2019

According to Babbie (2007), rates over 50% can be reported and a return rate of over 60% is good. The response rates from building contractors (Table 4.1 above) were lower than for specialist contractors. The downturn of the construction industry had impacted more on the former as compared to the specialist contractors.

Most of the main contractors supervised more than one category of works. For instance, one could do joinery work, masonry and painting. All the contractors in the sample (100%) acknowledged they were in charge of the kind of work that they did. Secondly, all said their terms of employment for the in-charges were on contract and not salary basis. It follows that 80% of these in-charges (operatives/workers) were paid by the main contractor, 20% by the subcontractor and none by the supervisors.

4.2 SUB-CONTRACTUAL ARRANGEMENTS

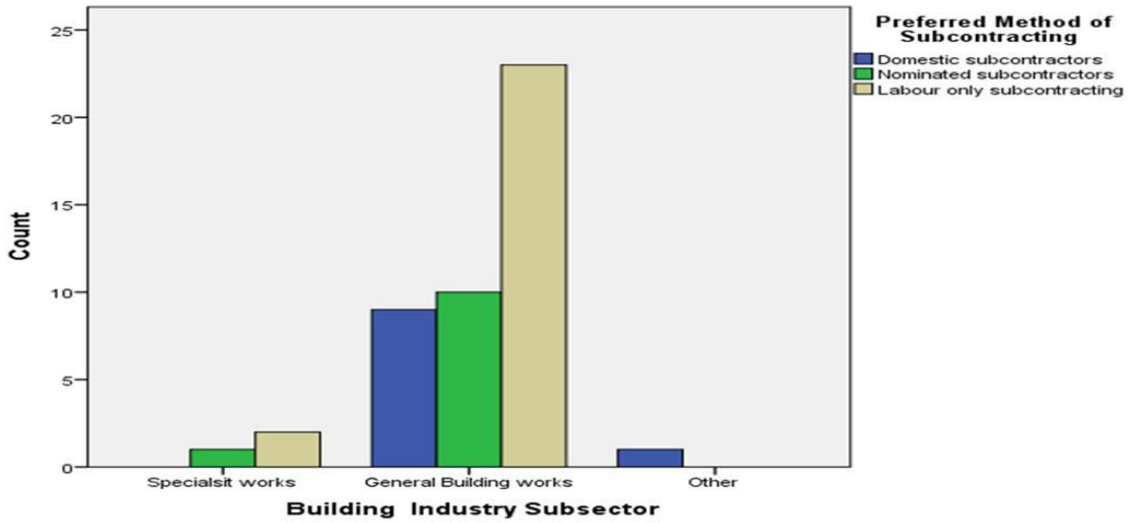

Figure 4.1: Preferred method of subcontracting

Source: Field Survey, 2019

Figure 4.1 shows the preferred method of subcontracting as labour only subcontracting, followed by nominated subcontractors, and finally, domestic sub-contractors. The specialist works tended to use nominated and labour only subcontracting. The building works industry tended to use all the categories of subcontracting with labour only subcontracting being used the most. The respondents explained their preferences as follows: labour only subcontracts were flexible and informal, domestic subcontracts were formal and flexible to work with, and nominated subcontracts were formal and reliable respectively. The main contractors reported that 70% had used intermediaries to source labour for them. This preference from main contractors can be contributed to by the advantageous position they have in subcontracting relationships because they can have flexible sub-contractual arrangements with low regard of H&S to improve on their profit margins.

4.2.1 SUBCONTRACT AGREEMENTS

The sub-contractual agreements used in informal subcontracting determine levels of H&S provisions provided for construction projects. The building contractors responded that they use informal subcontract agreements because of their flexibility as summarized in Table 4.3.

Table 4.3 Reasons for using informal subcontract agreements

Reasons for using informal subcontract agreements	5-Very Important (%)	4-Important (%)	3- Fairly Important (%)	2-Less Important (%)	1-Not Important (%)	Likert Mean
The Subcontracts are: - unsigned, verbal and flexible.	37	52.2	6.5	4.3	0	4.22
Fluctuating workloads: Informal contracts have seasonal workloads and have no/little insurance cover	21.7	54.3	17.4	4.4	2.2	3.89
Informal contracts- enable hiring of semi and unskilled labour who are affordable	26.1	47.8	21.7	4.4	0	3.96
Average Likert Mean						**4.02**

Source: Field Survey, 2019**.**

Table 4.3 shows an average Likert mean of 4.02 which affirms that informal subcontract agreements used in construction sites are important when building contracts are being drawn. The most sourced form of labour was “unskilled” and “semi -skilled” because of their ease of availability, affordability and their low bargaining power (due to lack of certified skills) makes them easily accept informal arrangements of work accounting for a combined mean of 67.6% of the labour sourced by intermediaries. Additionally, most contractors prefer to recruit their own skilled labour as supervisors. This imbalance tends to compromise H&S performance in construction sites.

Cheap construction labour increases the mark up of intermediaries with few skilled labours being assigned a large pool of unskilled workers to supervise as summarized in Table 4.4 below: -

Table 4.4: Labour outsourced through intermediaries

Type of Skill	Mean	SD
Very Skilled (Diploma & above)	14.44	17.40
Skilled (Artisans & Technicians)	17.78	2.64
Semi-skilled (Apprentices)	26.67*	5.59
Unskilled (School leavers)	41.11*	15.16

Source: Field Survey, 2019

4.3 MEASURES FOR HEALTH AND SAFETY

To establish the level of compliance of OSH Act 2007 by informal subcontractors, the study investigated by observation via a checklist of safety checks during site survey as summarized in Figure 4.2.

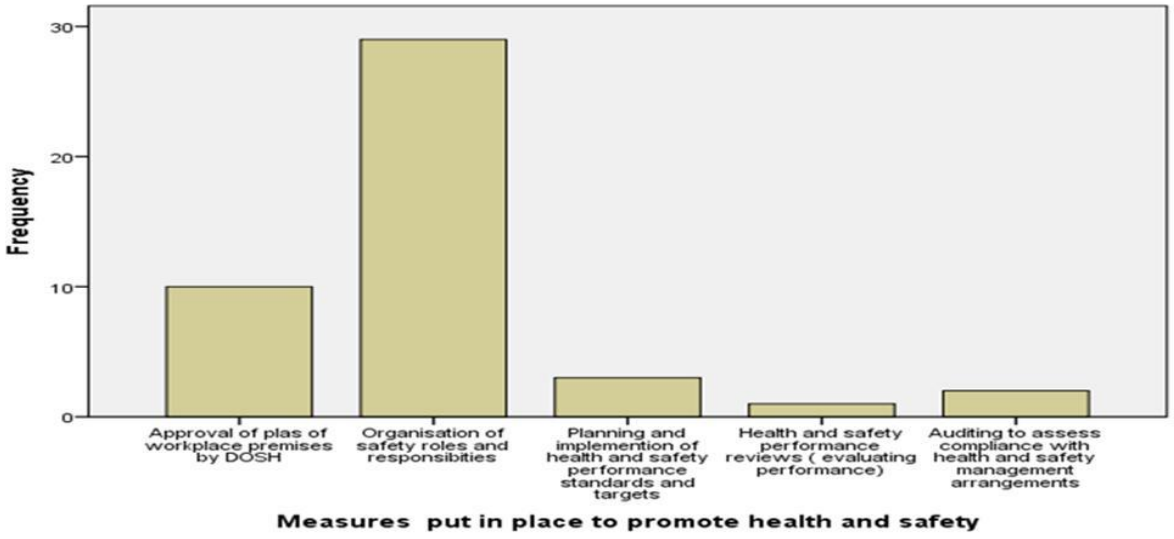

Figure 4.2: Measures for Health and Safety

Source: Field Survey, 2019

From the findings, site safety policy such as organization of safety roles and responsibilities scored well at 27.4%. Most contractors in the higher registration class categories such as NCA1 and NCA 2 post safety and health charter on their premises as per safety regulations. The challenge was found on the construction sites where other checks such as safety committees for evaluating health and safety performance reviews scored poorly at 2.2%, an indication that compliance/implementation of the safety policy was lacking. The DOSHS representative recommended improvement of current enforcement process to ensure effective registration and regulation of construction workplaces. Prosecution of errant contractors and increase of publicity through mass media, combined with enhancement of knowledge of OSHA through school curriculum, working closely with state corporations, county governments and increasing the number of enforcement officers was important in improving H&S performance on construction sites.

4.3.1 NATURE OF THE ACCIDENTS AS PER WORK CATEGORY

Prevalence of accidents was surveyed as a method to determine the level of compliance of OSHA on construction sites. The most prevalent nature of accidents at the construction sites were minor injury category followed by fatal injury category and last severe injury category. A high number of injuries were in the unskilled category reporting 23 out 34 accidents compared to skilled category with 10 out of 34 accidents. High numbers of injuries drawn from unskilled category affirm high levels of informality at the site as Table 4.5. indicates below:-

Table 4.5: Nature of accidents as per work category

The nature of the accident	**The work category that the accident victim belonged**			**Total**
	Unskilled labour	Skilled labour	Others	
Fatal injury	2	2	1	5
Severe injury	2	0	0	2
Minor injury	19	8	0	27
Total	23	10	1	34

Source: Field Survey, 2019

4.3.2 CAUSES OF ACCIDENTS AT CONSTRUCTION SITES

Causes of accidents as a measure of OSHA compliance was also surveyed. Worker's negligence or incompetence scored the highest frequency as a cause of poor site safety.

For building contractors, the score was 50% as shown in Table 4.6 and specialist contractors was 71.4% respectively as indicated in Table 4.7. This negligence and poor site working environment as seen in Fig 4.3 and Fig 4.4 can be attributed to the large use of unskilled/semi-skilled labour, and faulty equipment. Specialist contractors did not report inappropriate work methods or register other causes, an indication of better site preparedness compared to building contractor's courtesy of their relatively more skilled work that demands greater use of skilled labour. Both categories of contractors confirmed a preference in informal subcontracting which suggests it is a key factor in lack of H&S safety on construction sites, as summarized in Tables 4.6 and 4.7 respectively

Table 4.6: Causes of accidents at site- Building contractors

Causes	Frequency	Percentage	*Valid Percentage	Cumulative percentage
Worker's negligence or incompetence.	20	39.2	50	50
Poor site working environment from contractor.	10	19.6	25	75
Faulty equipment	6	15	15	90
Inappropriate work methods	3	5.9	7.5	97.5
Other causes	1	1.9	2.5	100
TOTAL	40	78.4	100	
Missing (non-responsive)	11	21.6		
TOTAL	51	100		

*Valid % excludes non-responsive participants to questions posted.

Source: Field Survey,2019

Table 4.7: Causes of accidents at site- Specialist contractors

Causes	Frequency	Percentage	*Valid Percentage	Cumulative percentage
Worker's negligence or incompetence.	5	50	71.4	71.4
Poor site working environment from contractor.	1	10	14.3	85.7
Faulty equipment	1	10	14.3	100
Inappropriate work methods	0	0	0	
Other causes	0	0	0	
TOTAL	7	70	100	
Missing (non-responsive)	3	30		
TOTAL	10	100		

*valid % excludes non-responsive participants to questions posted

Source: Field Survey, 2019

Fig.4.3 Poor Site Working Environment

Source: Field Survey, 2019

Fig 4.4 Uncsecured walls

Source: Field Survey, 2019

4.4 INFORMAL SUBCONTRACTORS' COMPLIANCE WITH NCA ACT 2011

To establish the extent of compliance of NCA Act 2011 by informal subcontractors, a structured interview with NCA official was done. The representative was of the opinion

that firms' compliance level stood at 70 percent in the construction industry. This level of compliance was attributed to: -

i) non-renewal licenses, impunity and ignorance of the law
ii) the cost involved in registering projects.

Evidence of abandoned sites and collapsed structures are prevalent in the Nairobi City County as confirmed in earlier researches (Muiruri 2012). The representative agreed that there were measures that could be put in place such as: -

i) restriction of errant construction firms. These included suspensions, penalties for late renewals in case of confirmed frauds, and deregistration of fraudulent firms. Lack of prosecutorial powers inhibited further enforcement of errant contractors.

4.4.1 AREAS NCA CAN ENHANCE H&S ENFORCEMENT PROCESS

The NCA representative gave suggestions that could enhance their current registration and regulation processes. Due diligence is required for all NCA applicants but currently, it's carried for categories NCA1, NCA 2 and NCA3 only due to limited capacity. There was need for NCA to employ more technical staff in order to increase its capacity in detecting errant contractors and encourage multi-disciplinary approach with other regulatory agencies such as NEMA and Kenya Revenue Authority (KRA) etc

4.4.2 CONFLICT WITH OTHER REGULATORY BODIES- NEMA & DOSHS

The research further established the occurrence of conflict between NCA and other regulatory bodies –NEMA and DOSHS. Working provisions of OSHA and NCA according to the interviewee, showed evidence of overlapping responsibilities in the area of noise levels and the working environment. These overlaps of responsibilities burden the contractors and creates fertile grounds for corrupt practices which compromise effectiveness in enforcing compliance by the respective agencies. Whenever there is a gap in enforcement, H&S is usually the first parameter to be overlooked. The NCA

interviewee was of the opinion that they indeed had some substantial capacity to deter errant contractor behaviours though not absolute capacity to carry that task.

4.5 RELATIONSHIP BETWEEN ORGANISATION CHALLENGES AND SAFETY PERFORMANCE

To examine the relationship between organisation challenges of informal subcontractors and H&S performance on construction projects, sources of challenges were investigated using a Likert scale where 1 represents no organisation, 2 weak organisation, 3 fairly strong organisation, 4 strong organisation and 5 very strong organisation respectively. Table 4.8 below, shows the results' summary.

Table 4.8: Sources of organisation challenges

Source of organisation Challenges	1	2	3	4	5	M	SD
Contractors- disputes on safety responsibilities.	2.2	8.6	43.5	34.8	10.9	3.43	.81
Site culture and risk behaviour- supervision of apprentices and indentured learners.	0	6.5	10.9	58.7	23.9	4	.83
Business—financial remittance of OSH Fund, administrative—management practices. Supervision of inexperienced workers	0	4.3	13.1	56.5	26.1	4.04	.81
Nature of the project—use of scaffolds in tall buildings, live and dangerous sites.	4.3	6.5	19.6	52.2	17.4	3.72	.90
Client's influence- on positive safety culture.	0	4.4	8.7	47.8	39.1	4.22	.63
Regulatory—prior approval by other agencies required.	6.5	19.6	50	17.4	6.5	2.98	.95

Source: Field Survey, 2019

The source with the strongest organisation challenge was client influence on positive safety culture, followed by business related factors—financial remittance of OSHA Fund,

administrative related challenges that espoused management practices and supervision of inexperienced workers. The third source was site culture and risky behaviour which was portrayed in the manner apprentices and indentured learners were supervised. The fourth source was the nature of the project (Ofori, 2015). This was in connection with the way scaffolds were used in tall buildings and some dangerous sites with live wires. The fifth source was from contractors' dispute on safety responsibilities. Lastly, the sixth source with the lowest challenge was regulatory in nature which involved prior approval by other agencies.

The role of clients is key in financing construction, including paying for Health & Safety as per tender documents (Wells 2007). The contractors usually don't price the item so as to remain competitive in the bidding process. This gap is usually informalized and causes dangers of unfulfilled health and safety measures in building projects (Wells 2007). The observations suggest that the best opportunity to improve H&S is via joint responsibility of the client and the contractor.

4.5.1 RATING ORGANISATION CHALLENGES

Additionally, the participants explained the sources of organisation challenges during the field survey. The frequency of organisation challenges in the various categories were surveyed and the top five rated organisation challenges rated as below: -

a) Limited finances which hinder purchase of health and safety equipment was the highest at 80.4%
b) client tight budgets which provide low margins for contractors to incorporate H&S practices came second at 78.4%
c) Site operatives who have untested working culture with little regard for the site safety and health came third at 74.6%;
d) Expensive multiple regulatory agencies came fourth at 58.8%;

e)Live and dangerous sites accounted for 47.0% and came fifth as frequent challenge in construction sites. The frequency rates were summarized in Table 4.9 below: -

Table 4.9: Frequency of organisation challenges in the various categories

Category	Sources of organisation challenges in the categories	F	%
Client	Client tight budgets provide low margins for contractors to incorporate health and safety practices.	40	78.4
	Clients' preferences for informal labour contracts inhibits site safety.	6	11.8
	Other	5	9.8
	Total	**51**	**100**
Regulatory framework	There are multiple agencies doing regulatory work hence expensive.	30	58.8
	Duplication of inspectorate works from a multiple agency confusing to contractors.	15	29.4
	Other	3	5.9
	Non-responsive	3	5.9
	Total	51	**100**
Business Environment	Limited finances hinder purchase of health and safety equipment.	41	80.4
	Corruption at sites makes enforcement of safety by the requisite agencies difficult.	7	13.8
	Other	2	3.9
	Non-responsive	1	1.9
	Total	**51**	**100**
Site culture and risk behaviour	Site operatives have untested working culture with little regard for the site health and safety	38	74.6
	Risky behaviour associated with the need to remain on the payroll endangers site safety.	9	17.7
	Other	3	5.8
	Non-responsive	1	1.9
	Total	**51**	**100**
Nature of the project	High rise buildings-- lack of scaffoldings and screens.	22	43.2
	Live and dangerous sites	24	47.0
	Other	2	3.9
	Non-responsive	3	5.8
	Total	**51**	**100**

Source: Field Survey, 2019

The above challenges majorly revolve around financing of construction projects and skilling of workmen. These organisation challenges compounded usually aggravate the already informal arrangements further compromising H&S performance in construction projects.

4.5.2 CORRELATIONAL ANALYSIS

There was further study to find out if there was a relationship between organisation challenges and the three major reasons of using informal labour only subcontracts. The results portrayed a positive correlation between organisation challenges and fluctuating work demands ($r = .34$, $p<.05$). This showed that as the level of fluctuating workloads increased so were the degree of organisation challenges. Similarly, the 'reasons for informal subcontracting and having subcontracts not signed' positively correlated with fluctuating workload ($r =.42$, $p<.05$). The unreliability of getting construction work leads to less efforts being ploughed back in the construction industry in terms of formalising processes. This forms a fertile ground for informal processes to take root in the construction sector making it a dangerous workplace for site operatives.

4.5.3 ANALYSIS OF VARIANCE

Besides correlational analysis, a one-way analysis of variance (ANOVA) was carried out to see if there were significant differences between the various NCA categories and organisation challenges at 95% confidence level (Gupta,2015). The Levene test (a test of homogeneity) was not significant $F (3, 41) = .97$, $P= .42$. The ANOVA results were significant. This implies the different NCA group membership/categories [NCA1&NCA2 (M= 4.61 SD = .54), NCA3 & NCA 4 (M= 3.75 SD= .27); NCA5 & NCA6 (M=3.71 SD =.47), NCA7 & NCA 8 (M=3.75, SD .44)]; had a significant impact on organisation challenges $F (3, 41) = 3.79$, $p <. 05$ as summarized in Table 4.10.

Table 4.10: ANOVA: Organisation challenges

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	2.144	3	.715	3.786	.017
Within Groups	7.739	41	.189		
Total	9.883	44			

Source Field Survey, 2019

A post hoc analysis was conducted using two tests Scheffe and LSD at 95% significance level. For Scheffe tests, it showed a significant mean difference between NCA1 & NCA2 with: NCA3&NCA 4 p<.05; NCA5 & NCA 6, P <.05; NCA 7& NCA 8, p <.05. However, there were no mean differences between NCA3 &4 with NCA5 &6 or with NCA7&NCA 8. Similar results were found with LSD tests. This implies that category NCA 1& NCA2 face less compliance challenges unlike the other categories because of their better financial and organisation abilities. The other categories face almost the same level of organisational compliance challenges because of increased unpreparedness in finances, technical capabilities and training of their site operatives making it riskier to work in such environments. These findings affirm that the alternative hypothesis (Ha) on influence of informal subcontracting and its effects on H&S performance on construction projects is true.

4.5.4 RECOMMENDATIONS ON HOW TO RESOLVE ORGANISATION CHALLENGES

The contractors made recommendations on how to resolve and minimize organization challenges experienced by both building works and specialist works' contractors. Content analysis informed the basis to identify the main categories (themes) from the data. The responses from the specialist works were used to identify initial categories, which were

later used to code responses from the building works. A close look at the responses from the two sets of contractors did not show any significant differences. The measures the contractors' suggested were summarized into four categories as discussed below: -

i) The Clients- related measures

These included measures to address health and safety concerns that clients could mitigate. It covered two areas of responsibility for clients to financially bear the burden of H&S either partially or fully. The client was also required to be advised on issues of health and safety, by ensuring/ following up with contractors to have all contracts formalised. In practice contractors don't price for health and safety because of competitive nature of bidding for works where expensive bids results in loss of work to most contractors. If H&S was funded by the client it would therefore be more guaranteed.

ii) The Nature of the Sub-Contracts'- related measures

These are measures that were to be enforced in the contract to mitigate the issues of health and safety. It was suggested that H&S budget be part of the contract monies. The contract should be tailored between contractors and subcontractors to discourage informal subcontracting and have appraisal clauses to address future informalities. Regulatory agencies are spread thin on the ground making enforcement of good health and safety practices impractical There is need to amalgamate regulatory agencies and increase their footprint on the ground.

iii) The Subcontractors'- related measures

These are safety and health measures that subcontractors were obliged to enforce. The measures included investment in safety gear such as safety belts, protective clothing and compliance with the subcontracts having provisions of health and safety. Other measures were awards as incentives on H&S, training, licensing and close supervision for them to maintain high standards.

iv) The Main Contractors'- related measures

These are health and safety measures that the contractors could mitigate. The measures for the main contractor included, ensuring health and safety issues were addressed even if it meant having local arrangements. The MC should prioritise workers health and safety above profits, be liable for accidents caused by subcontractors and advised not to use informal subcontracting. The contractors should be well trained and adequately sensitized through workshops or have expert personnel on health and safety. In addition, all subcontractors should work and be supervised by the main contractors.

v) The General measures

These measures were not targeted to a specific stakeholder in the construction industry but targeted to all the stakeholders. There were four categories which comprised ensuring proper planning on H&S on-site to prevent accidents, carrying out a risk assessment on-site on a daily basis to reduce risks, increasing safe working environment awareness on the building sites and having everyone on-site to be cognizant of the requirements of H&S policies. In addition to safety audits, clients should provide adequate budgeting for site safety and corrective measures taken to avoid relapses. Lastly, there should be qualified personnel on health and safety with adequate good quality PPEs available on site.

4.6 SUMMARY OF THE DATA PRESENTATION AND ANALYSIS

The alternative hypothesis (Ha) claim about influence of informal subcontracting and effects its on H&S performance on construction projects is true. Informality has infiltrated all the processes of subcontracting, enforcement of H&S by regulatory agencies and weakened organisation capabilities of actors in the building subsector as found in Nairobi City County. The findings on survey done correlates and agrees with secondary data presented in the literature review, that the influence of informal practices in subcontracting have adverse effects on health and safety on construction projects.

4.7 CONCLUSION

Analysis and interpretation of data informed the basis of discussion in this chapter, using, frequency tables, descriptions and inferential statistics(Creswell, 2013). The literature review provided background information and guided the study on the choice of subcontracting practice. The construction sites where the projects were carried out exposed the gaps of informal subcontracting between contracting parties. The construction projects also showed the challenges which regulatory agencies go through as they endeavor to enforce good practices in the building industry.

Chapter five summarized the study findings, listed recommendations for formalising the informal subcontracting practice and gave suggestions of further research.

CHAPTER FIVE

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.0 INTRODUCTION

This chapter focuses on the findings, conclusions and recommendations to the study. The field survey investigated the influence of informal subcontracting and its effects on H&S performance on construction projects. The specific study objectives of the research were: -

i)To identify the level of H&S provisions in informal subcontracting

ii)To establish the level of compliance of OSH ACT 2007 by informal subcontractors.

iii)To establish the extent of compliance of NCA ACT 2011 by informal subcontractors.

iv)To examine whether or not there is a relationship between organisation challenges of informal subcontractors and H&S performance on construction projects.

5.1 SUMMARY OF RESEARCH FINDINGS

To identify the level of H&S provisions in informal subcontracting the research found out that labour only subcontracting, was the most preferred method of subcontracting, followed by nominated subcontractors, and finally, domestic sub-contractors. The specialist works tended to use nominated and labour only subcontracting. The building works contractors tended to use all the categories of subcontracting with labour only subcontracting being used the most. The reasons advanced for the use of labour only subcontracting were flexibility and informality. Domestic subcontracts were formal and flexible to work with, and nominated subcontracts were formal and reliable respectively.

On the level of compliance of OSH Act 2007 by informal subcontractors, the findings indicate minor injury category was the most recorded nature of accidents followed by fatal

injury category with severe injury category coming at the tail end. A high percentage of injuries were also recorded in the unskilled category reporting 67.6% of the accidents followed by skilled category at 29.4%. The respondents' opinion of the major causes of construction accidents were worker's negligence or incompetence (50%), poor site working environment from the contractor (10%), faulty equipment (10%), and other causes (10%).

From the findings, site safety policy such as organization of safety roles and responsibilities scored well at 66.4%. Most contractors in the higher registration class categories such as NCA1 and NCA 2 post safety and health charter on their premises as per safety regulations. The challenge was found on the construction sites where other checks such as safety committees for evaluating health and safety performance reviews scored poorly at 2.2%, an indication that compliance/implementation of the safety policy was lacking.

Enforcement of the OSHA Act 2007, was plagued with compliance challenges when ensuring the safety of employees because of inadequate or poor scaffolding, lack of PPEs and plants that had not been inspected. For effective enforcement the DOSHS has to ensure effective registration and regulation of construction workplaces, prosecution of errant contractors /occupiers, increase of their publicity through mass media, enforce the knowledge of OSHA through school curriculum, work closely with state corporations and county governments and increase the number of enforcement officers with the requisite resources.

To establish the extent of compliance of NCA Act 2011 by informal subcontractors, a structured interview with an NCA official brought to the fore the challenges the regulatory agency faces in an environment of informal subcontracting by the contractors. The NCA representative was of the opinion that firms' compliance level stood at 70 percent in the construction industry.

On the area of enforcement, NCA agreed that there were measures that could be put in place to restrict/control errant construction firms. The measures included suspending the errant/non-compliant firms, imposing penalties for late renewals, and finally in case of confirmed frauds, NCA to caution, suspend, or deregister the fraudulent firms altogether

The relationship between organisation challenges of informal subcontractors and H&S performance on construction projects was investigated. The client influence on positive culture had the greatest source of organisation challenge at (M= 4.44; SD= 0.53), while the least source was regulatory related sources (M=2.89; SD=0.93). Client tight budgets provided low margins for contractors to incorporate health and safety practices. Clients' preferences for informal labour contracts inhibited site safety.

Measures to check on organisation challenges depended on the source of the respective challenge. The client through pricing of the BQ by the contractor should bear the burden of health and safety of the project at hand. Contractors should be encouraged not to use informal subcontracting which compromise H&S while subcontractors should be required to individually adhere to provisions of H&S in the subcontracts.

5.2 RESEARCH HYPOTHESIS

The influence of informal subcontracting has effects on H&S performance on construction projects which informed the main study objective of the research.

The null hypotheses (H0) and alternate the null hypotheses (Ha) for the research were: -

(H0) Influence of informal subcontracting does not affect H&S performance on construction projects.

(Ha) Influence of informal subcontracting affects H&S performance on construction projects

The research established that Influence of informal subcontracting does affect H&S performance on construction projects. The study established that the Nairobi City County construction industry is characterised by: -

1. significant prevalence for labour only contracting which is purely based on informal subcontracting
2. clients' tight budgets that minimise investment in H&S
3. lack of capacity on the part of regulatory bodies (like NCA and DOSHS).

These characteristics create preconditions that allow non-compliance of H&S requirements on construction projects by the informal subcontractors with impunity. The alternative hypothesis (Ha) claim about influence of informal subcontracting and its effects on H&S performance on construction projects holds true for this study.

5.3 CONCLUSION

Informal subcontracting has found its way in the building construction sector due to the labour-only subcontracting employed by many general and specialist contractors. The findings of the study affirmed this trend of subcontracting and the many instances of health and safety gaps found within building subsector. The findings of the study, concluded that improvement of H&S provisions in informal contractual arrangements must be upheld by all actors in the construction projects. The following practices should be upheld: -

i. Health & Safety provisions in informal subcontracting should be formalised. The regulatory body on H&S should ensure that there are registers, records, site safety policy, safety committees, safety equipment and H&S audits enforced in all sites.
ii. Level of compliance of OSH Act 2007 by informal subcontractors, should be enhanced. DOSHS as a regulatory body has to: prosecute errant contractors/occupiers, increase their publicity through mass media, enforce the knowledge of OSHA in through school curriculum, work closely with state

corporations and county governments and increase the number of enforcement officers and the requisite resources.

iii. Compliance of NCA Act 2011 by informal subcontractors should be enhanced. NCA can enhance their current registration and regulation process to include due diligence for all NCA applicants. NCA to also employ more technical staff in order to increase its capacity in detecting errant behaviours of contractors and collaborate with other regulatory agencies such as the Registrar of Companies, NEMA, and Kenya Revenue Authority (KRA) among others

iv. Organisation challenges impacting on informal subcontractors should be mitigated by having

collaboration of all actors in the construction industry. Clients should take a leading role in H&S by employing only contractors who have a good health and safety track record and who incorporate H&S provisions in tender documents.

5.4 RECOMMENDATIONS

The informal sector contributed 84% of new jobs, with the construction sector having a share of 6.2% of wage employment as per the Economic Survey of 2018 (KNBS 2018). The Challenge ahead is formalising the informal set ups found in the construction industry. The housing demand especially for low-income persons in Kenya has contributed immensely to informal settlements, where H&S malpractices are severest. The following recommendations of formalising the informal subcontracting practice will require support from all actors in the construction industry.

1. Enforcement of by- laws and other regulations by regulatory agencies.

Regulatory agencies such as DOSHS, NEMA and NCA should be well resourced financially and with enough personnel to enforce the laws, by- laws, and regulations during the project cycle.

2. Training contractors and subcontractors.

Attendance of continuous professional development programmes should be enforced to all contractors and subcontractors (formal and informal). This will keep them sensitised on health and safety requirements of the built-up environment.

3. Training of workers

There is need for continuous training of all workers in the built-up environment, skilled and unskilled besides sensitising them on the H&S requirements.

5.5 FUTURE AREAS OF RESEARCH

The influence of informal subcontracting has multiplicity of effects on various aspects in the building subsector. The investigation of this study narrowed on the area of informal subcontracting and its effects on H&S performance on construction projects. A study on how site culture and behaviour influences H&S performance on construction projects in Nairobi City County and other towns in Kenya is recommended as an area of further research.

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Appendix I

Introduction Letter

Michael M. Mbuvi
P. O. Box 5408-00100
Nairobi
September, 2019

The Management.

Dear

RE: ACADEMIC RESEARCH PROJECT FOR A MASTERS DEGREE PROGRAMME

I am a student at the University of Nairobi (UON) pursuing a Master's Degree Course in Construction Management. Part of the requirement is that I conduct a research project entitled the **"Influence of informal subcontracting on H&S performance on construction projects: The case of Nairobi City County".**

Please note that your construction firm was sampled and information given for this study is for academic purposes only, and utmost confidentiality will be given to the information provided.

We greatly appreciate your corporation and honesty in filling this questionnaire.

Thank you for your time.

Yours Faithfully,

Michael M.Mbuvi

Appendix II

Building Works: Main Contractors Survey Questionnaire.

Respondent's position . . . . (Optional)

Organization Code. . . . . ..

Date…….

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

A: Background Information.

1) What capacity do you serve in this firm?

☐ Director

☐ Project Manager

☐ Site Agent/Manager.

☐ Supervisor/General foreman.

2) How many years has your firm been in business?
…….

3) Under what category of contractor's registration by National Construction Authority?

☐ NCA1&2

☐ NCA3&4

☐ NCA5&6

☐ NCA 7& 8

4) What subsector of the building industry are you mostly involved in?

- ☐ Specialist works. E.g.
- ☐ General building works
- ☐ Interior fittings.
- ☐ Other (specify)…….

B: <u>Sub- contractual agreements: -</u>

5) What percentage of the work do you normally subcontract?

- ☐ 0-25%
- ☐ 25-50%
- ☐ 50-75%
- ☐ 75-100%

6) What is your preferred method when subcontracting?

- ☐ Domestic subcontractors
- ☐ Nominated subcontractors
- ☐ Labour only subcontracting.

7.) What reasons make you prefer the subcontracting method named in 6 above?

- ☐ Labour only subcontracts are flexible and informal.
- ☐ Domestic subcontracts are formal and flexible to work with.
- ☐ Nominated subcontracts are formal and reliable.
- ☐ Other (specify)…….

9) The following are reasons for informal subcontracting which adversely affect H&S performance at construction sites. Please indicate their level of importance to the main contractor.

Levels of Importance: Very Important=VI (5), Important= I (4), Fairly Important= FI (3), Less Important=LI (2) and Not Important =NI (1)

Reasons for Using Informal Labour only subcontracts.	**Level of influence**				
Vsc-5		Sc-4	Fsc-3	Wc-2	Nc-1
The Subcontracts are: -unsigned, verbal and flexible. - little Safety and Health, provisions hence affordable .					
Fluctuating workloads: - informal contracts have - seasonal workloads and have No/little insurance cover					
Informal contracts-enable hiring of semi and unskilled. labour who are affordable.					

C. <u>Compliance of OSH Act 2007 by informal subcontractors</u>

10) Is health and safety important in a construction site?

☐ YES

☐ No

11) If yes, have you recorded accident(s) or incident in your construction sites in the last 3 years?

☐ YES

☐ No

12) If your answer to the question above is **YES**, what was the nature of the accident(s?)

☐ Fatal injury

☐ Severe injury

☐ Minor injury

☐

Near miss

13) In which work category did the accident victim(s) belong?

☐ Unskilled labour

☐ Skilled labour

☐ Others

14) What in your opinion could have been the main cause of the accident(s)?

☐ Worker's negligence/incompetence.

☐ Poor site working environment from contractor.

☐ Faulty equipment

☐ Inappropriate work methods

☐ Other causes

15) Do you enforce a health and safety policy in your construction sites?

☐ YES

☐ No

16) If your answer to the question above is yes, which of the following have you put to use?

☐ Approval of plans of workplace premises by DOSHS.

☐ Organization of safety roles, and responsibilities

☐ Planning and implementation of Health and Safety performance standards and targets

☐ Measuring Health and Safety achievements (Monitoring, investigating and reporting accidents)

☐ Health and Safety performance reviews (evaluating performance)

☐ Auditing to assess compliance with Health and Safety management arrangements

D Organisation challenges of informal Subcontracting on H&S

Organisation challenges as stipulated in OSH Act 2007, by informal subcontracting can be attributed to other actors in the construction projects. Please arrange in hierarchy of 1 to 5 the degree of organisation.
Please arrange in hierarchy of 1 to 5 the degree of organisation.
Levels of organisation.
: Very strong organisation. =Vso (5), Strong organisation = So (4), Fairly Strong organisation = Fso (3), Weak organisation =Wo (2) and No organisation =No (1)

Sources of Organisation challenges.	**Degree of Organisation.**				
.	Vso-5	So-4	Fso-3	Wo-2	No-1
Clients' influence -on positive safety culture.					
Contractors- Disputes on safety responsibilities.					
Business – Financial -remittance of OSH Fund. -Administrative-Management practices. -Supervision of inexperienced workers.					
Regulatory-prior approval by other agencies required					
Site culture & risk behaviour- Supervision of apprentices and indentured learners					
Nature of Project-Use of Scaffolds in tall buildings -Live and dangerous sites					

16) For each 'source' state three organisation challenges?

a) Clients

☐ Clients' tight budgets provide low margins for contractors to incorporate H&S practices.

☐ Clients' preference for informal labour contracts inhibits site safety

Other
(specify)…….

b) Regulatory frame work.

☐ There are multiple agencies doing regulatory work hence expensive.

☐ Duplication of inspectorate works from a multiple agency confusing to contractors.

Other (specify)……. …….

……..

c) Business environment.

☐ Limited finances hinder purchase of health and safety equipment.

☐ Corruption at sites makes enforcement of safety by the requisite agencies difficult.

Other (specify)……. …….

d) **Site culture and risk behaviour.**

☐ Site operatives have untested working culture with little regard for site safety and health.

☐ Risky behaviour associated with the need to remain on the payroll endangers site safety.

Other (specify)…….

e) Nature of Project.

☐ High rise buildings- Lack of Scaffoldings and Screens.

☐ Live and dangerous sites.

Other (specify)……. …….

17). Kindly give some recommendations that can be used to resolve/minimize the challenges faced by contractors when dealing in informal subcontracting organisation arrangement.

1.……

2.……

Thank you for taking time to respond to this questionnaire.

Appendix III

Specialist Works: Sub Contractors Survey Questionnaire.

Respondent's position . . . . (Optional)

Organization Code . . . .

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

A: Background Information.

1.) What is your role in this construction site?

☐ Subcontractor.

☐ Labour only foreman/Supervisor.

2.) What type of works do you supervise or carry out?

☐ Plumbing and drainage works

☐ Electrical works

☐ Joinery works

☐ Masonry works

☐ Painting works

☐ Earthworks.

☐ Other (Specify) ……

3.) Do you have in-charges for each type of trade listed in No.2 above?

☐ Yes

☐ No.

4**.) If yes what are the terms of employment?**

☐ Salary

☐

5.) Who pays the in-charges in the trades listed in No.3 above?

☐ Main contractor

☐ Supervisor.

B: Sub-contractual arrangements.

6) Have you been engaged formally before as subcontractor/Supervisor?

☐ Yes

☐ No

7) If yes how was the subcontracting engagement carried out?

☐ Through consultants

☐ Through clients

☐ Through contractors

☐ Through intermediaries

☐ Other (Specify) …….

8) As a subcontractor/Supervisor have you engaged intermediaries to source labour for you?

☐ Yes

☐ No

9) What is the level of competence in percentage (%) of the labour sourced in No. 8 above?

Level of competence.	**Percentage %**
Very skilled	
skilled	
Semi-skilled.	
unskilled	
Total	100%

C. Compliance of OSH Act 2007 by informal subcontractors.

10) Is health and safety important in a construction site?

☐ YES

☐ No

11) As a Subcontractor or Supervisor do you have records of accident(s) or incident in your construction sites in the last 3 years?

☐ YES

☐ No.

12) If your answer to the question above is **YES**, what was the nature of the accident(s?)

☐ Fatal injury

☐ Severe injury

☐ Minor injury

☐ Near miss

13) In which work category did the accident victim belong?

☐ Unskilled labour

☐ Skilled labour

☐ Other specify……..

14) What in your opinion what could have be the main cause of the accident(s)?

☐ Worker's negligence /Worker's incompetence

☐ Poor site working environment from contractor.

☐ Faulty equipment

☐ Inappropriate work methods

☐ Other causes

15) Do you maintain a health and safety policy in your construction sites?

☐ YES

☐ No

16) If your answer to the question above is yes, which of the following have you put to use?

☐ Liaising with the main contractor in organizing safety roles and responsibilities.

☐ Creating a welfare programme in line to OSH Act 2007.

☐ Planning and implementation of Health and Safety performance standards and targets

☐ Measuring Health and Safety achievements (Monitoring, investigating and reporting accidents)

☐ Auditing to assess compliance with Health and Safety management arrangements

☐ Health and Safety performance reviews (evaluating performance)

D Organisation challenges of informal Subcontractors on H&S

Compliance challenges as stipulated in OSH Act 2007, by informal subcontractors can be attributed to other actors in the construction projects. Please arrange in hierarchy of 1 to 5 the degree of organisation challenges.

.

Please arrange in hierarchy of 1 to 5 the degree of organisation. Levels of compliance. : Very strong organisation. =Vso (5), Strong organisation. = So (4), Fairly Strong organisation. = Fso (3), Weak organisation. =Wo (2) and No organisation. =No (1)

Sources of Organisation challenges.	**Degree of Organisation**				
.	Vso-5	So-4	Fso-3	Wo-2	No-1
Clients' influence -on positive safety culture.					
Contractors- Disputes on safety responsibilities.					
Business – Financial -remittance of OSH Fund. -Administrative-Management practices. -Supervision of inexperienced workers.					
Regulatory-prior approval by other agencies					

required					
Site culture & risk behaviour- Supervision of apprentices and indentured learners					
Nature of Project-Use of Scaffolds in tall buildings -Live and dangerous sites					

17.) For each 'source' state three organisation challenges?

a) Clients

☐ Clients' tight budgets provide low margins for contractors to incorporate H&S practices.

☐ Clients' preference for informal labour contracts inhibits site safety

Other (specify)…….

……

b) Regulatory framework.

☐ There are multiple agencies doing regulatory work hence expensive.

☐ Duplication of inspectorate works from a multiple agency confusing to contractors.

Other (specify)……. …….

……..

c) Business environment.

☐ Limited finances hinder purchase of health and safety equipment.

☐ Corruption at sites makes enforcement of safety by the requisite agencies difficult.

Other (specify)……. …….

…….

d) **Site culture and risk behaviour.**

☐ Site operatives have untested working culture with little regard for site safety and health.

☐ Risky behaviour associated with the need to remain on the payroll endangers site safety.

Other (specify)…….

……..

e) Nature of Project.

☐ High rise buildings- Lack of Scaffoldings and Screens.

☐ Live and dangerous sites.

Other (specify)……. …….

……..

18). Kindly give some recommendations that can be used to resolve/minimize the organisation

challenges faced by contractors when dealing in informal subcontracting arrangement.

1.……

2.……

Thank you for taking time to respond to this questionnaire

Appendix IV

Challenges of Enforcing the Occupational Safety and Health Act, 2007.

Interview Schedule for an DOSHS official.

A) Registration

1. How is the procedure of registering construction workplaces?
2. Are there levies charged for registration?

   If yes, kindly list them.

   a) ……

   b) ……

   c)…….
3. In your opinion are the levies reason for non-registration of workplaces?

B) Enforcement.

5. In your opinion what is the level of compliance in the construction workplaces?
6. As DOSHS official what are the reasons of poor compliance, if any?
7. Have you handled prosecutions of offending parties in the construction workplaces?
8. Which parts of the Act do construction workplaces usually have challenges?

C) Conflict with other Regulatory Bodies-NEMA, NCA & DOSHS.

9. Are there overlapping regulatory responsibilities with other bodies?
10. Do you have adequate capacity to detect errant behaviour?

List down ways in which OSHA can improve on their current enforcement process for effective registration and regulation of construction workplaces in Kenya.

(i) ……

(ii) ……

Thank you for taking time to respond to this interview.

Appendix V

Challenges of Enforcing the National Construction Authority Act.

Interview Schedule for NCA official.

A) Registration

1. What is the procedure of registering construction firms?
2. Are there levies charged for registration?

   If yes, kindly list them.

   a) ……

   b) ……
3. In your opinion are the levies reason for non-registration of construction firms?
4. Do you register persons in the informal construction sector?

   If yes how different is the criteria from the one used in registering formal construction firms?

B) Enforcement.

5. In your opinion what is the level of compliance in the construction firms?
6. As NCA enforcement officer what are the reasons of poor compliance, if any?
7. Are there measures are in place to restrict or control errant construction firms?
8. Which parts of the Act do construction firms usually have challenges?

C) Conflict with other Regulatory Bodies-NEMA, NCA & OSHA.

9. Are there overlapping regulatory responsibilities with other bodies?
10. Do you have adequate capacity to detect errant behaviour?

List down ways in which NCA can improve on their current enforcement process for effective registration and regulation of construction firms in Kenya.

(i)……

……

(ii)……

Thank you for taking time to respond to this interview.

Appendix VI

RESEARCH PERMIT

UNIVERSITY OF NAIROBI
DEPARTMENT OF REAL ESTATE AND CONSTRUCTION MANAGEMENT
P.O. Box 30197, 00100 Nairobi, KENYA, ***Tel: No. +254-020-491 3531***
E-mail:*dept-recm@uonbi.ac.ke*

Ref: B53/80663/2012 **Date:** 12th September, 2019

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: MICHAEL MUTUA MBUVI – B53/80663/2012

This is to confirm that the above named is a student in the Department of Real Estate & Construction Management pursuing a Masters course in Construction Management.

He is carrying out a research entitled ***"Investigation of the Effects of Informal Subcontracting on Health and Safety Performance on Construction Projects; A Case Study of the Kenyan Construction Industry"*** in partial fulfillment of the requirements for the degree programme.

The purpose of this letter is to request you to allow him access to any kind of material he may require to complete his research. The information will be used for research purposes only.

Any assistance accorded to him will be appreciated.

Dr. Luke Obala
Ag. Chair & Senior Lecturer
Dept. of Real Estate & Construction Management