INFLUENCE OF GOVERNANCE FRAMEWORK ON MITIGATING BUILDING FAILURES IN KENYA

BUCHA PATRICK MWENDA

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Influence of Governance Framework on Mitigating Building Failures in Kenya

Patrick Mwenda Bucha

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DECLARATION

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

Signature…….…….Date…….

Patrick Mwenda Bucha

This thesis has been submitted for examination with my approval as University Supervisors

Signature…….…….Date…….

Dr. Dennis Juma, PhD

JKUAT, Kenya

Signature…….…….Date…….

Dr. Joseph Onyango, PhD

Strathmore University, Kenya

DEDICATION

This thesis is dedicated to my cherished parents for their diligence to bring me up and provide me with necessary education, my beloved wife for her tolerance and understanding, my daughters and son, may you be inspired and reach your visions and my loving friends for their never ending support and encouragement.

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ABBREVIATIONS AND ACRONYMS

BCA	Building Construction Authority
BORAQ	**S**Board of Registration for Architects and Quantity Surveyors
BS	British Standards
CEO	Chief Executive Officer
EBK	Engineers Board of Kenya
KNBS	Kenya National Bureau of Statistics
KEBS	Kenya Bureau of Standards
MTIHUD	Ministry of Transport, Infrastructure, Housing and Urban Development
NACOSTI	National Commission of Science Technology and Innovation
NBI	National Building Inspectorate
NCA	National Construction Authority
NEMA	National Environment Management Authority
NHC	National Housing Corporation
QS	Quantity Surveyor
KMO	Kaiser-Meyer-Olkin
OLS	Ordinary Least Square
VIF	Variance Inflation Factors

UNESCO United Nation Education, Scientific and Cultural Organization

DEFINITION OF TERMS

Governance Is the establishment of policies and continuous monitoring of their proper implementation, structures and processes designed to ensure accountability and transparency (Business Dictionary, 2016).

Building failure Is a situation where a building does not perform the functions for which it was intended (Boateng, 2020)

Design A graphical illustration that consists of the plan views, interior and exterior elevations, sections, as well as other drawings and details so as to give a picture of the main objective for a given structure which in this study is a building (NHBRC, 2007)

Building process - An expression of each step of a building project from the time of conception to final acceptance and occupancy, (Building Dictionary, 2017)

Building Any temporary or permanent, movable or immovable structure including a structure intended for occupation by people, animals, machinery or chattels or to form by combining materials or parts or a structure enclosed within a roof and within exterior walls housing, shelter, enclosure and support of individuals, animals, or real property of any kind (NHBRC, 2007). In this study, the term means any structure which is meant for occupation for commercial, residential, industrial or educational purposes.

Building Code -The legal requirements set up by the prevailing various governing agencies covering the minimum acceptable requirements for all types of construction (Building Dictionary, 2017). In this study, it was applied to mean a set of standards and guidelines to guide the building process.

Governance Framework Are structures and procedures that are intended to guaranteed, responsibility, control of law, expansive participation and set standards, qualities and rule of the game through which public undertaking are underseen (Bevir, 2013) in this study it means policies, laws and institutions that governce public affairs.

Legal framework A broad system of rules that governs and regulates decision making, agreements and laws (Translegal, 2017). It comprises a set of documents which include constitution, legislation regulations and contracts (Natural Resource Governance Institute, 2017). For purposes of this study, it is the acts of parliament, regulations and any government circulars providing directives and prescribing sanctions for deviations.

Policy framework - Set of principles, and long term goals that form the basis of making rules and guidelines and to give overall direction to planning and development (Standards Australia, 2006) in this study, this term carries the meaning of the policy or policies in the building and construction sector in Kenya.

Contextual framework - The surrounding circumstances (political, contemporary, historical, social and cultural), factors and inclinations within which something happens, (Your Dictionary, 2017). In this study, it is applied to mean the circumstances within which building takes place including bribery, professional practice and compliance.

Institutional framework - the systems of formal laws, regulations, and procedures, and informal conventions, customs, and norms that shape socioeconomic activity and behavior, (Pinheiro, 2016). In this study it means the institutions, their policies and procedures as well as their networks within the building sector.

Mitigation - Is the process of taking reasonable action where possible to avoid additional injuries or losses (Business Dictionary, 2016) in this study, it means Governance Framework put forth to minimize building failures in order to reduce human injuries and loss of investment.

ABSTRACT

Building failures have become a global phenomenon and have been increasing over the decade. This can be attributed to increased demand for residential houses, commercial and public buildings to accommodate human activities. The increased value of land and its scarcity has resulted in construction of high rise buildings that are complex. Developers have taken advantage of these demand particularly residential houses to construct sub-standard houses without following appropriate building procedures. Building failures can be attributed to usage of materials that are sub-standard in building works, utilization of unqualified contractors and professionals, poor or lack of inspection by the institutions mandated to undertake inspection, non-compliance with regulations, specification and standards, lack of regulatory enforcement mechanism and compromise in the building approval process. In Kenya the rate of building failures has increased over the last decade due to increase in demand for residential houses, commercial and industrial buildings as a result of increased population, high rate of urbanization and the effects of devolution. The study focuses on establishing the influence of governance framework on mitigating building failures in Kenya with emphasis to building policies, regulatory framework, institutional arrangement and contextual issues. The study population was drawn from institutions in both the National and County Governments involved in Policy and Legal formulation, planning and enforcement as well as regulatory professional bodies in the building sector. The total target population was eight hundred and seventy-seven (877) respondents, within the two levels of government. The study used stratified random sampling technique in selecting the sample. The sample size was 275 respondents. Primary data which is largely quantitative and descriptive in nature was collected by use of structured questionnaires. The questionnaire was pilot-tested to test whether the instruments are reliable and valid before administering in the actual study. In analyzing the data, regression analysis was carried out to identify the significance of each study variable. Descriptive statistics such as frequencies, percentages, the mean, standard deviation and standard errors were used in describing the data. Normality test was also done and finally multiple regressions and correlation analysis was conducted to establish the relationship between Policy, Legal, Institutional and Contextual framework on mitigating building failures. From the findings, it is clear that not all of the building professionals are aware of the building policies that are in place and being used and recommends that the institutions charged with the formulation and implementation of the building sector policies should involve the building sector professionals and stakeholders in the formulation, implementation and review of Sector Policies. The Study found out the existance of many policies in sector and recommends harmonization to a comprehensive and adequate policy that addresses all aspects of building process. The existing legal framework has inadequate sanctions and penalties for non-compliance and recommends review of current Building Code and strict sanctions and penalties be included in building laws and regulations. The institutions managing building sector should be capacitated to undertake inspection and supervision during construction stages. Bribery mostly takes place during inspections, design and approval stage of the building process thus exposing buildings to failures. Building authorities, developers and

institutions should hire and employ the services of building professional who can be held accountable in case of any professional negligence. Penalties and sanction should be imposed on both contractors and building professionals involved in bribery and those who use unorthodox construction method and faulty designs respectively to enhance discipline and to reduce building failure in the building sector. Thorough vetting of the building professionals should be done to give them a chance to defend their ethical/moral standing while annual renewal of practicing licenses should not be issued to professionals found guilty of corruption offenses. Finally, the study suggests a further research be conducted on the influence of governance framework on mitigating infrastructural project failures in Kenya.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

1.1.1 Governance Framework

Governance is the foundation of approaches and ceaseless checking of their legitimate execution by the individuals from the representing body or an association. It incorporates the approach required to adjust the forces of the individuals (with the related responsibility) and their essential obligation of upgrading the thriving and suitability of the association (Qiu, Chen, Sheng & Cheng, 2019). As indicated by Buitrago, Moragues, Calderón and Adam, (2018), governance alludes to structures and procedures that are intended to guarantee responsibility, straightforwardness, responsiveness, control of law, steadiness, value and comprehensiveness, strengthening and expansive participation. Governance likewise alludes to the standards, qualities and rules of the game through which public undertakings are overseen in a way that is straightforward, participatory, comprehensive and responsive. It is thus about the culture and institutional condition in which citizens and partners work together among themselves and take an interest in public issues. Therefore, governance is about policies, rule of law, inclusiveness, accountability and institutions.

Accountability is a fundamental requirement of good governance as it creates a playing ground for all players and fosters ownership (Albin-Lackey, 2013). It creates momentum for all players to feel obliged to abide by the rules of the game. For organizations to thrive, all players must be able to follow and understand all decisions made that affect the way they do business. No players should feel left out in the decision making process (Kaufman, 1999).

All Policies and regulations designed to steer public and private affairs should respect the Constitution and natural justice (North, 1998). All stakeholders should subordinate their

actions to the existing Laws in order to ensure harmony and fair treatment for all. Good governance should serve the interests of all players and should respond adequately and relevantly to the concerns of stakeholders. It should not be rigid to opinions and suggestions from players in the sector (World Bank, 1994). The State's ability to effectively coordinate the implementation of Laws and regulations is a key element in eliminating bad governance. This is because government is the only single body with such resources and acceptance to implement universally acceptable standards in all sectors (Kaufman, 2006).

Governance challenges coupled with capacity shortcomings contributed heavily to the collapse of buildings (Mutiso, 1996). The documented process challenges from inception to decommissioning include lack of coordination among the relevant institutions, inadequate professional endowment among approving officers, inability for staff in approving authorities to understand drawings and undetected omissions due to lack of accredited checkers. These views are collaborated by Olanitori (2011) who found that lack of institutional capacity and structures to ascertain concrete quality leads to use of compromised concrete and inadequate anchorage. Institutional capacity is a major contributor to success and should include tools and equipment, financial resources, human resources and technology endowment.

Any effective law must be anchored on strong policy on the side of government. Indeed, policy covers proper troubleshooting of the presenting challenges culminating with proposals for relevant and water tight legal mechanisms (Riemer, 2009). In order for laws to be effective it is imperative that they be preceded by strong policy background as a foundation in which to understand any sector and address its challenges. Policy coverage for the building and construction sectors of the East African region are glaringly weak.

There are many areas which are neither covered in policy or actual resultant laws (Rakodi, 1991). According to Wells (2014) corruption in the construction industry in Kenya, like in many other African countries is so real. Wells (2014) particularly singles out the construction approval and implementation process as that one which ropes in many

players who often find themselves compromised due to lack of capacity or mere greed. It is these grey areas that accumulate to monumental losses of life and property when buildings fail.

Nduthu (2012) clearly brings out professional ethics in construction and laments that while there are codes of ethics for virtually all players including contactors, very little is done to ensure that such codes are followed strictly. There are many ways of escaping the nets of ethics in the construction industry. These have led to a near breakdown in the construction industry management and governance system leading to unprecedented building failures. Nduthu (2012) argue that construction is one industry that can never flourish unless there are very clear governance systems to control and check all players within a context of law and accountability.

1.1.2 Building Failure

Building failures have become a global phenomenon and of great concern due to deaths, maiming of people and loss of investments. The increased population growth rate as well as urbanization which has resulted to increased demand for residential and commercial buildings to accomodate increased human activities leading to construction of substandard buildings to meet increased demand hence increased building failures. According to World Population Bureau (2019), the population of the world stands at 7.7 billion while according to KNBS (2019), Kenya Population Stands at 47.6 million people with prospects of growth at 3% per annum. United Nations (2012) shows a positive trajectory in growth of megacities from only 3 in 1975 to 16 in year 2000 and a projection of 27 by the year 2025. These large urban agglomerations have a population of more than 10 million people driving the demand for high rise buildings.

Africa's economic growth has seen the middle class grow to 34.3% of the population with Kenya having 44.9% of the population being middle income class which is associated with high demand for housing. This growth has been accompanied by rapid urbanization and strong growth characterized by high housing demand (Arvanitis, 2013). Developers

have taken advantage of this increased demand to build substandard buildings without due regard to building process leading to increased building failures. Building failures occur when a building is not able to perform the functions for which it was intended or designed for. Building failures are classified in two broad groups namely physical and performance failures. Physical failure is also referred to as structural failures and they result in loss of strength while failures in performance imply reduced functionality below a set limit which is not acceptable (Boateng, 2020). Structural failures occur when loading dynamics are complicated or compromised in design or during construction leading to total collapse of the building.

Performance failures can be induced by nonstructural components and factors such as poor maintenance or exposure to adverse climatic conditions (Rosetto, 2016). In 2003, a balcony collapsed in Chicago, United States of America while in the same year Katowice Trade Centre's roof collapsed in Poland killing 65 people. In the same year Jaya supermarket collapsed in Petaling, Malaysia killing 9 people (Hui, 2017).

In Bangladesh, Rana Plaza, a building meant for commercial purposes comprising of eight stories collapsed in April 2013 killing about 547 people and injuring about 2,500 others with many people missing (Butler, 2013). Studies show that the failure of Rana Plaza is the deadliest factory accident that has been recorded in history. In June 2009, a building under construction collapsed at Lianhuanan Road in Shanghai, China where the building killed one person and destroyed several property. Upon investigation, it was established that the building collapsed as a result of inappropriate construction procedures. On one side of the uncompleted building, construction workers unearthed an underground garage and stacked earth on the other side, thus erring. Reports indicated that the building was near a flood-prevention wall which had developed cracks. It became evident that the building failed because of ignorance of the contractor and neither the blueprint drawing nor weakness of the construction materials (Subramanian, 2009). In 2014, Canacona building in India collapsed due to strong beams and weak columns. The under-construction five-storey structure collapsed killing 18 workers and injured 14 others.

Substandard quality of the construction materials, inadequate soil analysis, and poor workmanship were the main causes for the disaster (Tan & Abdul-Rahman, 2005).

In Africa, many countries including Nigeria have experienced the problem of collapsing buildings, which has led to loss of property and lives. The unfortunate incidents have been common in Nigerian cities such as Lagos, Abuja, Port Harcourt, Ibadan, and Enugu and about 112 incidents of collapsing buildings took place between 1978 and 2008 and evident through investigation indicate that completed and uncompleted Nigerian buildings collapsed because of various causes (Chendo & Obi, 2010).In 2006, an uncompleted three-storey building collapsed in Ghana killing an engineer and studies show that the building owners contracted informal laborers, who did not have knowledge and skills required in the building and construction industry also Bab Berdieynne mosque Mineret collapsed in Morrocco, while Ikeja city mall in Lagos Nigeria collapsed in the year 2010 (Oyegbile, Tat, & Olutoge, 2012).

According to Kioko (2014), who studied the causes of building failures in Africa, collapse of buildings is mainly due to lack of an African Code of Practice and most codes used are foreign codes either from Britain or India applied in the use of local construction materials and points out that building failures are as a result of the usage of substandard materials in building works, poor workmanship, incompetent contractors, non-compliance with specifications and standards, failure to supervise or inspecting works poorly, structural defects, corruption, conversions and alteration that are illegal.

There is need for professional inspection of both materials being used on ongoing construction works, the common inspections carried out during construction by the approving authorities include foundation inspection to ensure that the substructure is strong enough to support the intended building, sheetrock inspection done after foundation for laying of plumbing and heating system, construction inspections which are scheduled to take place regularly and to rhyme with major milestones and final inspection which is aimed at the issuance of occupation certificate, all these inspections are geared towards

ensuring compliance with the building code and other design requirements (Hannah, 2014).

In Kenya there has been rising cases of fatalities due to building collapses. On 22nd October 2009, a building collapsed in Kiambu killing 16 people while on 5th June 2009, a building under construction in Kisii collapsed killing one man and trapping construction workers for a day and in 2012, a four-storey building under construction collapsed in Mlolongo, causing death of about five people and injuring ten others as the private developers failed to follow due diligence (Chege, 2013).

According to Economic Survey (2016), in 2015, the building and construction industry in Kenya registered 13.6 per cent growth compared to 13.1 per cent recorded in 2014. The value of reported building plans approved went up from Kshs. 205.4 billion in 2014 to Kshs. 215.2 billion in 2015 representing an increase of 4.8 per cent. The value of reported new buildings completed in Nairobi increased by 15.1 per cent to stand at Ksh. 68.6 billion in 2015. This is due to increase in demand for residential houses, commercial and industrial buildings arising from increase in population, high rate of urbanization and the effect of devolution.

The Kenya National Housing Policy (2004) indicates that demand for housing stands at 150,000 units per annum explaining the mushrooming of substandard buildings which have continued to pose danger to life. Such buildings have been collapsing killing many Kenyans and maiming others. The Constitution of Kenya (2010) under Article 26 provides right to life and under The Economic and Social Rights, Article 43(b), provides right to accessible and adequate housing and to reasonable standard of sanitation. Therefore, to address the requirements of the Constitution of Kenya, there is need to address how to reduce collapsing of buildings that have claimed many lives while at the same time addressing the issue of provision of adequate housing to satisfy the increasing demand.

Table 1.1: Incidences of Building Collapse in Kenya from 2006 to 2014

Municipality	Year	Deaths	Injured
Nairobi	2006	14	77
Ngara Street	2009	11	0
Kiambu	2009	17	10
Kisii Town	2009	4	14
Kiambu	2010	3	4
Kiambu	2011	0	0
Embakasi	2011	4	6
Langata	2011	0	6
Ngara	2011	0	5
Mathare	2011	1	9
Luanda	2011	4	18
Bungoma	2012	1	0
Kisii	2012	0	3
Mulolongo	2012	5	10
Kisumu	2013	9	35
Nairobi	2013	11	90
Thika	2014	0	4
Total		**84**	**291**

Source: Raul, (2014). Strategies to reduce the Risk of Building collapse in Developing Countries.

Vibrant building industry in Kenya is primarily guided by the Building Code which dates back to 1968 and other fragmented legislations which carry disjointed provisions. The vibrancy has been caused by rapid urbanization and devolution which has created enormous opportunities for housing development even in far flung areas of the country with accessibility challenges. Over the last ten years, over 100 cases of building failures and especially collapses have been reported. In Nairobi alone, reports have indicated that over 50% of the buildings are potentially dangerous and could fail anytime due to structural and other failures. Several of such buildings have collapsed on their own, while 30 buildings have been demolished by the state to avert loss of life and property. A total of 256 building in the city are earmarked for demolition due to documented failures discovered through scientific testing. A total of 4,690 buildings have been inspected for integrity out of which 640 have been found to be out rightly dangerous. These figures are

worrying given that the audit of buildings has only covered a small portion of the city (National Building Inspectorate Report, 2016), and to mitigate these problems a proper governance structure must be put in place.

1.2 Statement of the Problem

Building failures have become a global phenomenon attributed to use of substandard building materials and structural deficiencies (Kioko,2014; Rosetto,2016). While studying the collapse of Hotel New World in Singapore, Seng (2011) cited poor design and lack of stringent building regulations or standards. Victoria (2012) suggests that vigorous criteria should be set to inspect the suitability of buildings progressively throughout the life of the buildings while Festus (2012) suggests a stringent set of standards as a cure for building failures in Europe.

In the African region, various scholars including Madu (2005), Fagbenle (2010), Chendo and Obi (2015), Oloyade (2010) and Anthony (2013) who studied the causes of building failures in the west African region, identified structural defects, design faults, material weaknesses, poor workmanship, climatic conditions and even natural factors such as floods and strong winds as major causes of building failure and suggests that proper concrete mixes, approved steel qualities and cross checks in engineering calculations to be the cure. Oloyede (2010) noted that in Nigeria, use of low quality materials and employment of incompetent professionals and artisans are causes of building failures.

In Ghana, Botchway, Afram and Ankrah (2014) notes that it is a design issue and suggested design integrity should be ensured and be supervised by competent professionals during implementation. Abimbola and James (2012), recommends an overhaul of the policies, mainly the building codes to initiate sustainable measures and enforce the industry's best practice. Adewuyi (2010) recommends the establishment of both supervision and inspection units for the entire construction period. A study on Incessant Collapse of Buildings in Nigeria found that 50% of building collapses arose

from design faults, 40% from faults related to construction sites, and 10% as product failure (Olagunju *et al*. 2013).

Kenya has experienced increase in building failures over the last 10 years which has killed and maimed many people and destroyed investment. According to KNBS (2019), Kenya's population in 2019 stood at 47.6 million people, which was an increase from the 37.7 million people the country had in 2009. This increase in population has come with attendant socio-economic challenges in the country, one of them being housing scarcity. While Kenya's Vision 2030 strategy targets provision of 200,000 housing units annually, and even though Kenya's President launched the Big Four Agenda which has affordable housing as one of the targeted areas, Kenya still has a great shortfall in the housing sector (World Bank, 2017).

Despite the promulgation of the Constitution of Kenya (2010) which defines the functions of National and County Governments, the establishment of National Construction Authority (NCA) in 2011 and the National Building Inspectorate (NBI) in 2015, the situation has worsened. According to NBI, (which was established in 2015 through a Presidential directive as a result of the increased number of collapsed buildings) Building Inspection and Audit Report (Sep, 2019), a total of 14,751 buildings were audited with 10,648 houses found unsafe and 10,070 have been demolished.

The NBI, Building Audit Report (2015), indicates that in the early 80's and 90's, Kenya had almost zero cases of collapsing buildings. However, due to increased demand for residential houses, commercial and public buildings, and as population increases coupled with high rate of urbanization, the trend has changed. In Nairobi 50% of the buildings are potentially dangerous and could fail any time due to structural and other failures (NCA, 2018). Investors and developers have taken advantage of the high demand for houses and inadequate capacity of County Governments and other institutions to enforce building regulations and therefore sub-standard structures have become the norm rather than the exception. As such, reduction of building failures and eventual collapse are matters of

national concern due to loss of human life and loss of investment including environmental degradation.

The Global, Regional and Local literature review and the structural integrity report (NBI, 2019) shows an increasing trend of building failures which is of great public concern which prompted the researcher to seek a solution to address this challenge. The measures which government has applied in addressing the issue has been more of reactive as the attention is when the building collapses, while this study offers a proactive approach to prevent the occurrence through use of governance framework that include policies, laws and institutions of governance to regulate and provide leadership to the sector.

1.3 Research Objectives

The study was guided by the following objectives;

1.3.1 General Objectives

This study sought to establish the influence of Governance Framework on mitigating building failures in Kenya.

1.3.2 Specific objectives

1. To determine the influence of policy framework on mitigating building failures in Kenya
2. To examine the influence of legal framework on mitigating building failures in Kenya
3. To establish the influence of institutional framework on mitigating building failures in Kenya
4. To establish the influence of the contextual framework on mitigating building failures in Kenya

1.4 Hypothesis

The hypothesis of the research was;

H_{01}: Policy Framework has no significant influence on mitigating building failures in Kenya

$H_{02:}$ Legal framework has no significant influence on mitigating building failures in Kenya

H_{03}: Institutional framework has no significant influence on mitigating building failures in Kenya

H_{04}: Contextual framework has no significant influence on mitigating building failures in Kenya

1.5 Significance of the Study

1.5.1 Building Industry Stakeholders

This study finding established more ways to stakeholders in identifying specific causes of building failures and addresses them sufficiently using the suggested tools. The findings of this study presented a holistic approach to mitigating building failure within Kenya. The study contained theoretical and practical implications for the future of the building sector in Kenya through considering Kenya's institutional framework, inspection capacity and law enforcement strategies. The construction approach that the construction industry engages in has little stakeholders' involvement and not in tandem with sustainable development principles and thus results in the underperformance of construction works particularly buildings. Through the findings of this study, stakeholders should be able to participate in redefining the policies and building regulations and to initiate sustainable measures and enforce best practice.

1.5.2 The Government

The findings of the study established benefits both to National and County governments. The Constitution of Kenya (2010) mandates the National Government under Article 21 (b) to take the legislative, policy and other measures including setting of standards. Therefore the study findings benefits institutions mandated to formulate policies and regulations at National and County Government to engage in setting adequate policies and resultant regulations for effective implementation. The Constitution further under Forth Schedule provide the County Government with the function of planning and implementation. The study findings provided County Government with a framework in which County institutions mandated to approve building plans, inspection of buildings and enforcement of the regulations are empowered and capacitated to perform the function.

1.5.3 Scholars

Little research has been conducted into the influence of governance framework on mitigating building failures. The finding from this study serves to enrich information on building research from which scholars develops further studies. For example, cases of collapsing buildings may serve as case studies for engaging students while teaching the broader professional issues. Similarly, revealed gaps with regard to building sector laws and policies serves as a brainstorm to both researchers and scholars on how to sustainably bridge the gap. The findings thus was found to be useful in integrating both professional and technical matters in the education sector.

1.5.4 The General Public

The public benefited from the findings where recommendations being; residential houses or construction sites assured of constant monitoring and evaluation. Therefore translating to building with better structural integrity and ultimately less injuries and deaths as a result of collapses hence assurance of safety and secure buildings. The findings also creates

awareness on the role of the National and County Governments on mitigating the risks associated with buildings failures.

1.6 Scope of the Study

The study was conducted in Kenya, and more precisely the construction industry which is very complex and wide comprising of roads, bridges and buildings. This study dealt with buildings which includes residential houses and commercial buildings. It covered building failures within the construction industry in Kenya and focus on governance issues which includes policy framework, legal framework, institutional framework and contextual framework. It encompasses study of sector policies, regulations and various laws and building code guiding the building sector. The study also examined institutions of governance mandated to formulate policies and implement the regulations at both National and County level. The population for this study was drawn from both the National Government and County Governments. Under the National Government, the study gatherered information from officers of the National Construction Authority (NCA), National Building Inspectorates, Kenya Bureau of Standards, Professional Bodies and Officials of the Ministry of Transport, Infrastructure, Housing, and Urban Development. Also, the study included officers drawn from eleven (11) county government and particularly from the departments of planning, compliance and enforcement to determine their role in mitigating building failures.

1.7 Limitation of the Study

The study was conducted in Different Counties in Kenya, which have a diverse population and geographical locations where most of the offices have their different norms of

operations hence the researcher was forced to understand these norms. Due to diverse location, researcher had to travel all the way to those counties to book appointment with the intended respondents which was characterized with a lot of challenges.

Reaching professionals was a challenge since most of them work in the field, this required seeking convenient time from the respondents.

There was reluctancy on side of the respondents in giving views on sensitive questions particularly the question on bribery and therefore the respondents were assured that this is an academic research and the information provided will be treated with strict confidence

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter covers theoretical framework highlighting the anchoring theory, the conceptual framework where it explains various variables and their relationships. This is followed by a review of relevant literature, empirical review, critique of reviewed literature, research gap and summary of the Chapter.

2.2 Theoretical Framework

Under this section the study discusses system theory, power elite theory, Deontological and institutional theory, explaining their relevance to the study and connecting the theories to the study variables.

2.2.1 System Theory

The theory was developed by Ludwig, Niklas and Keneth (1954), the Theory posits that the performance of the whole is greater than sum of the performance of its parts and tries to expound more on how sub-systems are working in a correlation and coordinated manner to achieve a specific task. As per Midgley (2003), a system comprises of four sections. The first is the objects, the parts, components or variables inside the system, these might be physical or theoretical or both, contingent upon the nature of the system. Second, a system comprises of attributes– the qualities or properties of the system and its objects. Third, a system has internal connections among its objects. Fourth, systems exist in an environment. A system, at that point, is an arrangement of things that influence each other inside a domain and shape a bigger example that is not quite the same as any of the parts (Infante, Rancer, & Womack 1997). University of Twente (2016) posits this theory as the trans-disciplinary investigation of the organization of phenomena, independent of their substance, type, or spatial or temporal scale of existence. It investigates both the principles

common to all complex entities, and the (usually mathematical) models which can be used to describe them.

Wiener (1949) found that the gist of systems theory is the ability for diverse disciplines to communicate about their problem and that it enabled a common set of standards to be connected to issues of control and regulation. Pugh (2010) considered the various ways to deal with creating sound governance system as well as policy for the housing industry and made a conclusion that these approaches had just fragmentary connections to general land policies, to the improvement of housing finance systems, and to the more extensive economic, social and institutional conditions for upgrading the qualities and supplies of housing.

According to Pugh (2010), the systems theory helps to understand the synergies that are required in the sector from all stakeholders particularly how the various institutions and players in the sector ought to move together as a system in order to deliver efficiency. The theory also explains the institutional relationships that must be maintained within the sector, intra and interrelationships. Intra relationships can be viewed in the lenses of this theory as the relationships among the many institutions as a network in the sector while inter relationships can be viewed as the internal institutional arrangements within each institution which plays a role in the sector.

According to Flood and Jackson (1991), there are two categories of system, the open and closed system. Closed systems are systems that are not affected by the environment while open system is greatly influenced by the external environment. Feedback loops arising from systems can be positive where it denotes lessons learnt or negative denoting areas which needs improvement within the whole system. The building delivery process can be viewed as a whole system which has sub systems. In terms of governance, the institutions within the sector are all meant to feed into each other in order to create harmony. Right from design and conceptualization stage, the institutions and players involved ought to move like gears in harmony. The approval stage must feed into the implementation and maintenance stage while the operation relies more on the designs and as built drawings

produced by the project team. The building process should flow systematically from inception to demolition and learning with all sub systems falling into each other to avoid conflict and friction (Pugh, 2010).

Systems theory is relevant since it addresses the institutional arrangement applicable in the building sector in understanding the interrelationship of various departments, sections, segregated professional disciplines, units, institutions which work together in the sector. Unless, these parts work in sync, there cannot be success in the overall organizational layout in the building sector. However, this theory does not give emphasis on a start and end point in the system and assumes that each element need to be guided or controlled, that if each element functions optimally the entire system just flowed (Chikere & Nwoka, 2015).

2.2.2 Power Elite Theory

The theory was established by Wright (1956) to describe and explain the power relationships in a contemporary society. This theory proposes that governance is by a class of people who occupy dominant and top positions of influence and power in society and that many policies and decisions are made by three groups of people who include leaders in the corporate arena, senior officers in the military and notable leaders in the political arena. What these three groups agree upon is largely what becomes law or guides to the way industries and sectors are managed hence selfish and partisan interests in their decisions or guidelines. These groups ensure that most of the policies benefit cartels outside government (Mills,1963). Under this arrangement, policies are designed to benefit the elite and as such majority of small players are left out to bear the burdens of heavy regulations while a few dodge state supervisions (Summers, 2006). The power of the elite can be felt in all sectors because they seek to control all activities for the benefit of their political and business interests. They can resist and frustrate any effort to bring order if that order is going to disorganize their interests even if it is meant to be a benefit to the masses (Domhoff, 2006).

The theory is relevant to the study since it tries to find out how policies are formulated, their coverage, participation and who the policies are meant to serve. The theory was useful in finding out whether the existing policies take into consideration the interests of sector stakeholders. This theory was also used to check if the existing policies are tailor made to solve specific sector challenges and whether all stakeholders were involved in identifying the challenges to be addressed using these policies. GoK (2010) envisages full participation in making policies, this theory was used to gauge the levels of participation in developing sector policy for the building sector and whether that participation or lack of it has any influence in the efficiency of the final policy product.

However, power elite theory flourishes well in regimes which have political vacuum or power gaps. Wolfensohn (1999) found that cartels and organized monopolistic tendencies in power distribution came up to fill gaps created by political vacuums and that such gaps do not necessarily persist after democracy and institutional independence is realized. Mills (1963) himself contradicted the theory by postulating that power elite tendencies are associated with the mid-life entrepreneurs who slowly become compliant with democratic intervention as they progress in age. This creates the impression that power elite is temporary and not a permanent problem in formulation of policy**.**

2.2.3 Deontological Theory

The theory was developed by Kant (1945), the theory recognizes that law and morality are deeply connected but are not one and the same. Morality is a measure or depiction of what is good or bad according to a certain culture. Human laws are therefore defined by morality and not necessarily by an authority figure such as government or security agencies. Humans are often guided by their human nature to figure out what laws are and which ones to conform to (Kainz, 2004).

The theory describes duties that people have towards one another more so in the housing construction, the person in charge should construct a house that is safe to the one living in. Further this theory is based on the idea that each individual has the power to determine

his or her own moral law. This was seen to be of helpful in the housing construction where the morals of the contractor cover the safety of the beneficiaries and to understanding this, individuals must accept the fact that all people are morally free and that each person assigns his or her own duties. The theory described duties as being of two basic types, one which is perfect and the other which is imperfect. Duties can also be positive, in that it requires a person to act in a certain way benefiting the surrounding, or it can be negative, requiring that a person not act in a certain way that will not benefit the other. Perfect duties are absolute and in construction industry the contractor should be guided with the urge to construct an absolute building which suit the users in terms of ventilation, space and accessibility. They should always be followed and never conflict with one another's interest (Jacobs, 2012).

According to Kant (1945), duties are formed using the categorical imperative, an idea that when assigning duties, each person should create them in such a way that they believe that all people in the world can and should abide by them. This is called the universalizability principle. The theory advocates for the perfect system, while creating powerful absolute laws, generally creates duties that are positive (do not harm), but does not allow for the creation of many negative duties. In effect, perfect duties tell us what not to do but do not direct us to positively engage in any particular actions. Imperfect duties, which include 'positive' duties such as beneficence (the duty to help others) are argued for on slightly different grounds. Since we acknowledge that, all people are capable of creating their own moral law.

According to Frankena (1973), the deontological perspective states what is morally right is not dependent on producing the greatest level of good as opposed to evil, but rather it is determined by characteristic of the behavior itself. Helms and Hutchins (1992) assert that deontology considers the moral value of a behavior to be independent of the outcome since the certainty of these outcomes is questionable at the moment of the decision to act. Deontological thinking is therefore grounded in the belief that actions, in and of themselves, can be determined to be right or wrong, good or bad, regardless of the consequences they produce and this concept is always applied in the buildings. The theory

tend to focus on the contextual framework where it tries to explain the sole purpose of law as it tends to provide justice and any law which does not provide justice equally is a bad law. Any law which is good is moral and any moral law is good. The law is a unifier that seeks to create commonness of behavior, (Jacobs, 2012). The application of the theory is that the concept of morality is not subjective and this means that what is good and right is the same everywhere. Equally what is immoral is same everywhere hence the universal application of law and morals, (Devine, 2000).

The theory is used to understand contextual issues in solving dilemmas in the construction sector based on what is right and morally correct. It is used to understand how compromise in building approval process, inspection and use of unethical practices can be rooted out from the building sector as well as understanding how they crop up within the circumstances that surround the entire building system. This theory assumes a universal human being who readily accepts what is viewed as right by majority and does not provide scenarios where what is good in one end can be bad and prohibited in the other.

2.2.4 Institutional Theory

This theory was developed by Meyer and Rowan (1991), later advanced by William (1995), the theory considers the processes by which structures, comprising plans, rules, norms, and schedules end up noticeably settled as definitive rules for social conduct. The fundamental premises and ideas of the institutional theory approach give profitable rules to dissecting hierarchical condition associations with accentuation on the social desires, values, tenets and norms as the wellsprings of pressure on associations (Porter & Kramer, 2007). This hypothesis is based on the idea of authenticity as opposed to proficiency or impact as an essential hierarchical objective (Kramer, 2007). The environment is conceptualized as the authoritative field, represented by establishments like administrative structures, legislative organizations, courts, experts, proficient standards, interest groups, public opinion, laws, principles and social esteems.

Oliver (1991) opines that institutional theory assumes that an organization complies with its environment with pressures from different stakeholders affecting how the organization acts. Meyer and Rowan (1991) attest that the environment within which an institution operates can capably impact improvement of formal authoritative structures, typically more significantly than pressures within the market. Different advocates of the institutional theory, for example, Porter and Kramer (2006), hypothesize that creative structures that enhance specialized effectiveness in early-adopting associations are legitimized in the environment. These developments in the long run achieve a level of legitimization where inability to embrace them is seen as careless and nonsensical. At this point, existing and new associations embraced the auxiliary shape, regardless of the possibility that the frame does not enhance efficiency.

The demerit of institutional theory shows some fundamental components of the agencies environments have not been fully addressed. This arises from the feeling that, as a result of pressure from stakeholder groups, the firms' behavior is also influenced (Oliver, 1991). From this argument, external organizational factors such as inclusion of stakeholders' views have not been given key consideration by this theory. Similarly, the way the stakeholders interact in terms of their policy framework and harmonization of institutional laws are not considered. Institutional theory is relevant to this study since it informs the governance issues.

The institutional environment strongly influences the building sector. When there is a good working environment, then there is likelihood of a regulator ethically meeting its objectives. The theory deals with how organizational structures as a whole have gained acceptance by the society at large with a virtue of legitimacy that empowers the firms primarily by making them seem natural and meaningful (Suchman, 1995). It also concerns the multiple factors influencing a firm's choice of strategic response with strategies on a continuum ranging from passive to active options (Fineman, 2000). With respect to regulatory institutions, and the whole spectrum of governance in the building industry, the theory applies well in looking into agencies such as the National Construction Authority (NCA), National Environmental Management Authority (NEMA), County Governments,

Government Ministries, among others and how they weave together in curbing building failures. The place and role of each institution remains of great significance in managing the incessant building failures. There is a need for organizational interlinks and capacities to exist which are necessary for institutional success. Clear roles for each of the constituent institutions needs to be spelt out. Institutions are a critical component of governance.

2.3 Conceptual Framework

A conceptual framework is an intermediate theory seeking to connect different facets of inquiry, thus acting as a guide to empirical study and is much dependent on the hypothesis. The framework is engaged in recognizing potential action to be taken, or to offer an ideal alternative approach to a thought or idea (Somekh & Cathy, 2015).

The study conceptualized the variables into two, the independent variables and the dependent variable where independent variables were; Policy Framework, Legal framework, Institutional Framework and contextual Framework while the Dependent Variable being mitigation of building Failure as shown in Figure 2.1.

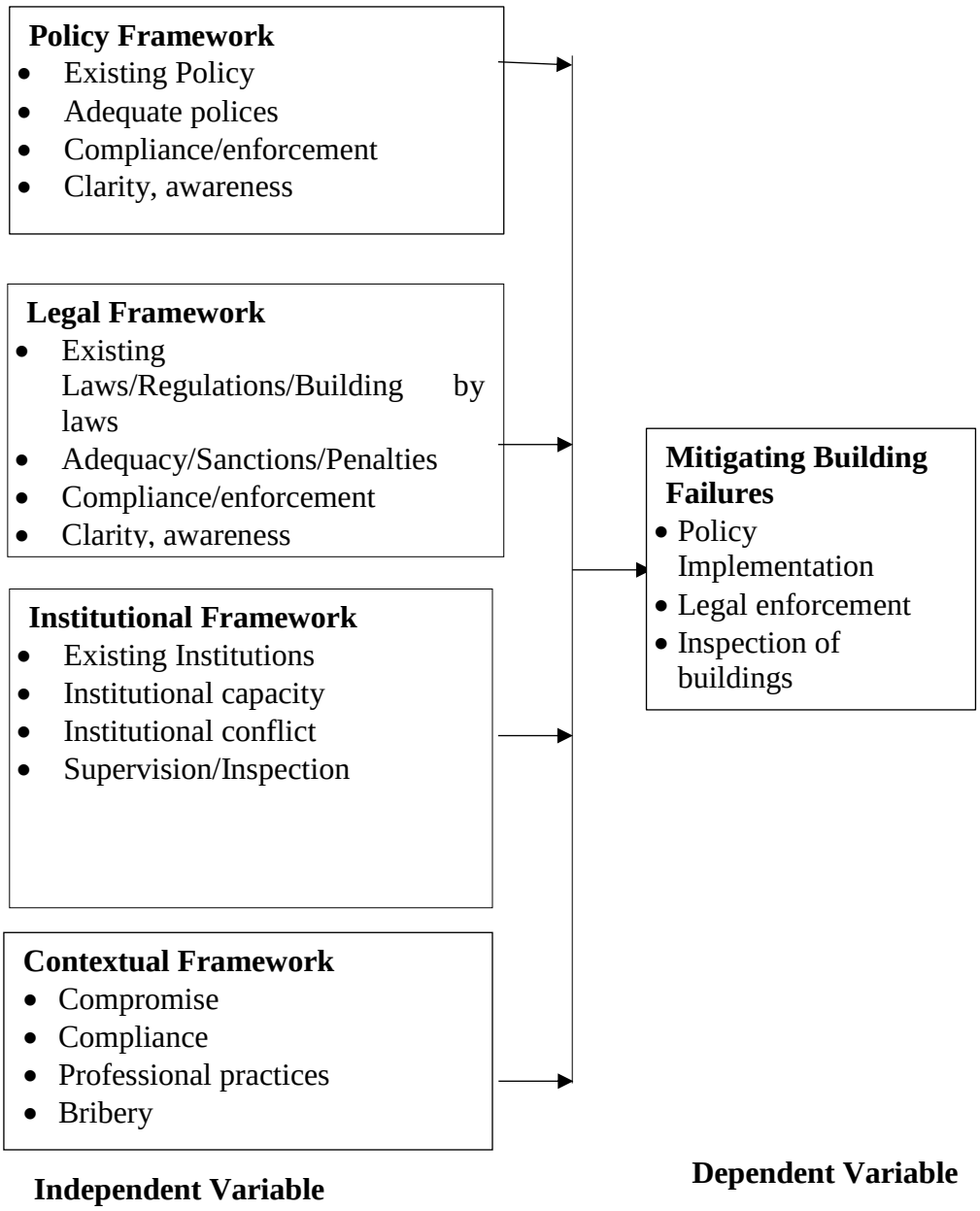

Figure 2.1: Conceptual Framework

2.3.1 Policy Framework

Policy refers to a set of principles by which government activities are guided or the declared objectives that a government seeks to realize (Okeke, Sam-Amobi, & Okeke,

2020). The purpose of policy is to convey overall mission of an organization, ensure clear understanding of expectations, influence behavior and support ethical decision making, foster credibility and trust as well as create ground for development of standards. Sapru (2009) discusses the concept of public policy as not being a precise term but a concept which denotes a declaration of goals, course and actions, general purposes and an authoritative decision. It can also be used to depict desired objectives or processes within government (Owusu & Bowang, 2017). Public policy guides activities which are consistent with development and constitutions and carries principles of a general nature whose purpose is to point the wholesome development of a county towards a certain direction (Sapru, 2009).

According to Kuta (2021) the institutional nature and approach to policy covers institutions and individual offices which are mandated to implement certain government decisions. Actions of individuals are directed towards government and hence need to create policy and institutions such as legislature, judiciary and bureaucracy. Without policy, legislative efforts would be disjointed and blind to the core challenges ailing the industry. This is because the proper way to make law is to begin from identifying sector challenges and then weaving solid policy grounds and direction for the sector after which attendant laws and regulations can be made (Sapru, 2009).

The housing sector in Kenya is guided by the Housing Policy (Sessional Paper number 3 of 2016). The policy centers on affordability and access to housing and outlines specific aims of increasing access to housing including empowering the poor to access housing and basic services and infrastructure necessary for a healthy living environment especially in urban areas. Encouraging integrated, participatory approaches to slum upgrading, including empowering the poor access housing and essential services and infrastructure fundamental for a sound living condition particularly in urban zones. Empowering coordinated, participatory ways to deal with slum upgrading, including wage creating exercises that successfully battle destitution, advancing and financing of research on the improvement of building materials and development methods among others. The policy recognizes that there is a gap in housing delivery of about 200,000 houses annually which

gives room to unscrupulous business parties to seek ways of quickly coming in to take advantage of the gap by providing substandard houses and evading regulatory requirements as much as possible.

Policy requires an institutional mechanism for implementation in order to actualize the envisaged benefits of the policy (Vedung, 2017). Clearly, the Housing Policy (2016) does not cover critical areas of implementation mechanism of guidelines in the sector. The inability to foresee the chaos resulting from the vibrancy of the multiple efforts to meeting the envisaged housing demand is in itself a deficiency of the policy. The housing policy is weak and this coupled with the absence of a construction policy only compounds the problem of governance in the building industry. This research sought to establish the cardinal weaknesses of the current policies and whether they can be relied upon to manage the entire building sector effectively.

Other subsector polcies affecting building includes National Urban Development Policy, (NUDD), National land Policy and National Environment Policy (2013), Maintenance Policy (2016) and Slum Upgrading and Protection Policy (2016).

2.3.2 Legal Framework

Legal framework is a broad system of rules that govern and regulates decision making, agreement and laws. In this context, legal framework includes sets of policies in the building sector that provides guidelines to the building processes and in which laws governing the building sector are anchored (Natural Resource Governance Institute, 2015). Legal framework comprises of sets of documents that include the constitution, legislation, regulations and contract.

Constitution as a body of fundamental principles or established precedents according to which a state or other organization is acknowledged to be governed. It is the bedrock of all policies and legislation that govern all sectors in harmony. All laws derive their life from the constitution. The Constitution of Kenya (2010), Article 24(1) guarantees the right

to life for every citizen and goes on to provide that such a right cannot be denied. It is worth noting that citizens have continued to lose life from collapsing buildings and that the state has been exploring ways of placing responsibility where it should be. Death due to collapsed buildings could therefore be viewed as a violation to the right to life. This is because the constitution in article 21(2) mandates the state to take legislative, policy and other measures to ensure progressive realization of the guaranteed rights. While the constitution has provided the seed bed for all necessary laws to sprout, there has been a lag within the legislative arm and thus up to now, no significantly effective law has been formulated towards the realization of safety in the built environment. Schedule four of the Constitution of Kenya (2010) places the function of formulating housing policy to the National government. The Housing policy has been under review to match the new constitutional dispensation, a situation which has hindered the realization of critical milestones towards safety in the industry.

Although the constitution of Kenya has established very powerful institutions and commissions to deal with thorny issues in society such as justice, elections, land and environment, the building industry which is critical in development has not been given prominence. Item number 20 in the fourth schedule provides the National government with the mandate to manage including legislating on disaster management. Although there are ad hoc arrangements to deal with disaster, there is presently no concrete policy or law to cover disasters such as building failures in the building sector. As a result, building failures have always caused untold suffering and loss in the absence of policy or law to mitigate and preempt.

The fourth schedule (21) also gives National government mandate to coordinate land planning all over the country. In the contrary, the mushrooming of unplanned settlements in virtually all counties has become such a burden. Each year, new slum settlements develop as a result of weak housing provision capacity and lack of stringent planning regimes in the counties. Part two of the fourth schedule (8) gives the county governments the mandate to coordinate and manage county housing planning and development. In the absence of national standards and guidelines, this has led to substandard buildings coming

up all over particularly to answer to the soaring demand for residential and office accommodation demand created by devolution. The result has been building failures witnessed in almost all counties. Building regulations in Kenya are contained in the Building Code (1968) which is currently under review. The code stipulates the guidelines for actual construction. The age of the code says everything about its efficiency in bringing safety within the sector. There has been no review on the same and even though many of the regulations have become archaic and obsolete, they have continued to hold to the disadvantage of the sector. Some of the very clear shortcomings included the code's inability to absorb new technologies and trends including energy efficiency, decommissioning of condemned or substandard buildings and environmental concerns. Anchored on the defunct local government act (Cap 265), the code lacks provisions on building maintenance which has also been cited as a cause of building failures.

The Building Code (1968) was anchored in the now repealed local government act upon setting in of devolved governance system. There are no guidelines as to where the existing building code is currently anchored. The Building Code (1968) adopted from Britain is obsolete considering new building trends and complex construction technologies. The Physical Planning Act (Cap 286) gave local authorities certain powers with regard to building development. These incorporate, to forbid or control the utilization and improvement of land and structures in light of a legitimate concern for appropriate and deliberate advancement of its region; to control or deny the subdivision of land or existing plots into littler regions; to consider and endorse all improvement applications and allow all advancement consents; to guarantee the best possible execution and usage of affirmed physical improvement designs; to detail by-laws to direct zoning in regard of utilization and density of advancement; and to save and keep up all the land made planned for open spaces, parks, urban timberlands and green belts as per the endorsed physical advancement design. The exercise of these powers has not been forthcoming and unauthorized buildings have continued to come up. Some of the buildings which have collapsed killing innocent citizens have been built up on swampy or marshy areas even riparian land in total disregard of the existing development planning and control provisions of the respective areas.

The Act further, provides sanctions for persons who construct buildings which are not approved. The country is yet to see a person convicted for building without approval and this has become an incentive for developers to quickly construct substandard buildings knowing that conviction will not happen. The whole regime of development control hasn't been enforced in Kenya despite the provisions. Allmendinger (1996) points out that physical planning is a political issue that needs strong backing and will be from political class. County governments Act no. 17 of 2012 gives power to county governments to implement the functions of the constitution which fall under county governments. Its main object is to implement part 185 of the Kenya Constitution 2010 as well as schedule four which stipulates the role of county governments. Among the provisions of the act is the mandate for county planning which encapsulates development planning. It spells out the elaborate mechanism for preparation of county integrated plans in collaboration with national government to ensure harmony of development within the country.

Other Acts of Parliament affecting building includes Urban Areas and Cities Act (2011), Environmental Management and Coordination Act (1999), Public Health Act Cap 242, Engineers Act (2011), Architects and Quantity Surveyors Act Cap 525, Physical Planning Act 2017, Housing Act Cap 117 andCounty Governments Act (2012).

The National Construction Authority Act no. 41 of 2011 carries the mandate of sanitizing the building industry from the face but doesn't contain much in terms of implementable provisions. It is full of ambiguous provisions which have made it hard to apply with the desired result. Part XIV of the local government act gives the minister powers to make adoptive bylaws to govern the construction industry in the country. These adoptive bylaws have come to be known as the building code. However, a lot of these provisions were lost when the Act was repelled in the onset of devolution. These provisions, some of which are anchored in the building code are not in operation today, were useful in ensuring order and safety in the industry and should be provisioned in the current legislative framework to avoid a lacuna and institutional disconnects which unscrupulous merchants in the sector could exploit.

2.3.3 Institutional Framework

Institutional framework is defined as systems or networks of organizational established and prevalent social rules that structure social rules, Hodgson (2016). Institutional framework enables ordered thought and expectations by imposing form and consistency of human activities. The durability of institutions depends on how they can create stable expectations and sustain pressure to deliver the expectations (Sudgen, 1986). Institutions are useful in that they can either constrain or enable certain behaviors, institutions enable people to make choices and model certain behavioral tendencies. Institution are codifiable outfits, meaning that they only exist because of common rules, without common rules and identity, institutions would become useless and the basis for establishing and enforcing rules would collapse, (Mantzavinos, 2001).

People respect rules depending on how the institutions behind them conduct themselves. People interpret rules according to the weight the parent institutions give them. Weak institutions result from not being able to follow up on rules with disincentives and deterrent sanctions, (Schotter, 1981). There are institutions which are self-organizing and those that are managed from outside by other institutions which leads to the framework or network disposition of institutions. Stand-alone institutions have very low efficiency, (Searle, 1995). Executive Order No. 1 of 2016 issued by the government of the republic of Kenya established the Ministry of Transport, Infrastructure, Housing and Urban development as a bid to consolidate the infrastructure sector and bring responsibility as well as synergy. The State Department of Housing and Urban Development was created and mandated with management of the built environment with Board of Registration of Architects and Quantity Surveyors placed under it. Public Works Department was also created by this same order and placed in close proximity to the housing docket to try and enhance collaboration in the sector.

The mandate of the State Department of Housing and Urban Development is elaborated as “Formulation, implementation and review of housing sector policy, Improving the living environment in slums and informal settlements through slum upgrading, Promotion

of low cost housing development through housing sector incentives, Promotion of research and utilization of appropriate building materials and technologies, National Secretariat for coordination of stakeholders on housing and human settlement matters, Facilitating Civil Servants to own houses through Civil Servants Housing Scheme Fund, Leasing of office space and residential accommodation for constitutional office holders and disciplined forces, Resolution of disputes between landlords and tenants in controlled residential tenancies, Development of Housing through National Housing Corporation (NHC) and Facilitation of home ownership through Housing Finance" (Executive Order no. 1 of 2016).

According to the report of the National Buildings Inspectorate (2016), the inspectorate was established to inspect all buildings within the republic to ascertain their integrity levels in order to avert failures which have often been associated with weak structural designs and implementation lapses. National Buildings Inspectorate (2016) brings out several symptoms of buildings which might fail. These include surging beams and columns, leaning and sinking as well as dangerous cracks in structural walls. In Nairobi alone, 1,440 buildings were classified as being dangerous while some 640 buildings were indicated as having irreparable damages that could cause them to collapse any time. However, the report laments that the inspectorate's mandate ends with the inspections and notices issued in collaboration with the County Government. There is no law upon which to anchor any disciplinary action that may be preferred against errant practices noted in the course of inspections. National Construction Authority (Act no. 41 of 2011) was established with main objective being the regulation of contractors. Along with regulation which includes making of regulations to govern their practice, the authority also trains and registers contractors in a bid to ensure compliance to ethics and morals in the construction sector.

Billington (2014) clearly sets out the premise for regulation as being the backing of law and regulations within the sector. Jameson and Berg (2008) postulate two schools of thought when it comes to contractor regulation. The positive theory details the role of government in protection of consumers by establishing watchdog institutions. It goes

ahead to propose that the role of government is to protect stakeholders interest in the construction sector to ensure that losses do not drive investors to bankruptcy which has an overall effect in the economy. Kenya Bureau of Standards (KEBS) is a statutory body established under the Standards Act (Cap 496) of the laws of Kenya. KEBS commenced its operations in July 1974 and its core mandate is; Promotion of Standardization in commerce and industry, Provision of testing and calibration facilities, Product and system certification, Undertaking educational work in standardization and practical application of standards and Maintenance and dissemination of International System of Units (SI) of measurements.

The Architect (2011) points out the role of KEBS in construction as being to ensure that all materials used in building are of the required strengths and qualities. Weak materials have a direct role in the causing of building collapses because structural strength depends a lot on the strength of materials used. Construction materials in Kenya are tested and certified by KEBS but there needs to be a way of disseminating such information to users of such materials and even to end consumers. Madu (2005) identifies substandard materials as a key causes of building failures and suggests that material testing cannot be left to the builders whose sole aim to make profit at the lowest cost possible and points out that there has to be an independent way of certifying materials for use in the construction industry.

2.3.4 Contextual Framework

Contextual framework is the surrounding circumstances (political, contemporary, historical, social and cultural), factors and inclinations within which something happens, (Your Dictionary, 2017). In this study, contextual framework was applied to mean the circumstances within which building takes place including compromise, compliance and professional ethics. The building industry is exposed to many cultural issues including unethical behavior and unfair competition which are a breeding ground for corruption, (Omollo, 2019). The circumstances surrounding the occurrence of something can be referred to as the contextual framework. Culture is one of those circumstances which

shape procurement and management of business in the building industry, (Momanyi, & Kamau, 2020). Oded (2013), points out that the construction sector all over the world is ripe with creative ways of avoiding responsibility and evading the arm of law. These creative ways range from ignoring standards and corruptly influencing approvals as well as compromising officials involved in inspection of buildings during or after construction (Proske, 2021).

Githui (2012) argues that the lives of many Kenyans who occupy buildings for various purposes depend so much on the integrity of the professionals involved in design and supervision of the construction and points out that structural engineers owe a duty of care to occupiers of buildings they design and as such should be ready to take responsibility when fatalities occur as a result of their faults and negligence. Dimuna (2011) argues that collapse of buildings is caused by design and that designs should be checked well before approval. Smith (2020) agrees that high levels of morality and ethics should be inculcated in the construction industry in order to curb building failures. Some of the accidents leading to loss of life and property could have been prevented with extra care and responsibility on the side of practitioners and developers. Mutiso (1996) reiterates the alarming role played by corruption and ineptitude in abetting the challenge of building failures and points out various corrupt practices which have led to the quagmire as including; compromise of inspection officials, ignorance of building standards, absentee professionals, incompetent staff approving drawings they can't understand, professionals overlooking small mistakes as well as the lack of stringent disciplinary mechanism for malpractice.

Architects and Quantity Surveyors Act (Cap 525) provides for the regulation of persons registered to practice as architects and Quantity Surveyors. It also defines practices amounting to professional misconduct and the punitive measures to be taken against the culprits. It establishes the board of registration of Architects and Quantity Surveyors (BORAQS) which is mandated with the duty of maintaining the register of Architects and Quantity Surveyor among others. Similarly, the Engineers Act (Cap 530) carries some disciplinary procedure for malpractice among Engineers. Hinze (2011) concurs that

engineers like any other professionals all over the world have a duty to protect life and are bound to certain ethical practices such as; using their knowledge and skill for the enhancement of human welfare and the environment; being honest and impartial and serving with fidelity the public, their employers and clients; striving to increase the competence and prestige of the engineering profession; and supporting the professional and technical societies of their disciplines.

Nduthu (2012) clearly brings out the contextual issue of professional ethics in construction and laments that while there are codes of ethics for virtually all players including contactors, very little is done to ensure that such codes are followed strictly. There are many ways of escaping the nets of ethics in the construction industry (Kuta, 2017). These had led to a near breakdown in the construction industry management and governance system leading to unprecedented building failures.

2.3.5 Mitigating Building Failures

Mitigation is the process of taking reasonable action where possible to avoid additional injuries or losses (Business Dictionary, 2016) in this study, it is used to mean policies, procedures and action taken to lessen and avoid additional injuries and losses as a result of building failures. Building failures occurs when a building loses it's ability to perform the function for which it was designed. Building failures are categorized in two major forms namely physical and performance failures. Physical or structural failure is attributed to overloading resulting to extensive damage of structural components which may result to total or partial collapse. Performance failure is associated with the loss of ability by non-structural components such as loss of ventilation, excess leakages or dire state of disrepair (Boateng, 2020).

In order to identify failures, various inspections of buildings are recommended. These include building condition survey, stock condition survey, and schedule of dilapidations, measured survey, schedule of condition, survey of building under construction and survey for alteration. The purpose of such inspections is to ensure that structural defects due to

lack of maintenance can be detected and rectified early to keep building structurally sound for continued occupation, particularly as building age, and wear and tear set in (Ayagu & Koech, 2019).

Government of Queensland (2011) provided details of the mandatory inspection of all buildings in order to enable certification for new occupation or continued occupation. The guidelines provided to building owners ensure that their building are in compliance with state requirements for safety and health. The inspections are anchored in the building code and have policy and legal backing for prosecution in case of default. Inspections start from development approval with site inspection for suitability as well as inspection of building plans by professional. Subsequently, foundation inspection, slab and columns inspection which includes walling and final stages inspection encompassing site and drainage inspections are done before occupation certification is given. Remedial measures or condemnation is given where necessary.

City of Chicago (2010) outlines the mandatory requirements for registration of each multiple storey building in the city. It requires that any building containing four (4) or more family units or sleeping accommodations for ten (10) or more must be registered with the building department each year and that any alteration to the same must also be registered with the same body. This registration incudes details of the owner, materials used, contractor employed, professionals involved, street address as well as any records for alteration. This registration ensures ease of access in evacuation and tracing of maintenance of the building in the city.

According to Oloyede (2010) who studied collapse of buildings in Nigeria, non-compliance with the law and slow or selective application of the law and weak capacities in oversight agencies are major causes of collapse of buildings. The third variable is the institutional framework which the study finds important in applying to understand the capacities, adequacy, competencies, staffing levels, training, resource and alignment to emerging challenges. Institutional framework becomes also important in understanding

the network of institutions involved in the sector as well as their relations and synergies in mitigating building failure.

In Kenya, the statistics of buildings which have failed or have been found to have the weaknesses which can cause failure, are of great concern. The National Building Inspectorate (2016) has inspected a total of 4,690 buildings in Nairobi alone out of which 30 houses have been demolished while 1,440 building have been classified dangerous and requiring to be demolished. This is a significant number given that it only covers one county and there are 46 other where buildings are yet to be inspected.

The laws are enacted by parliament, and with most government institutions and agencies being established by Acts of Parliament. The Policy makers who formulate such laws, do not accordingly subject them to adequate stakeholders and public opinions before implementation. This thus creates a scenario of inadequate laws governing the industry (Obuya, 2012). Even for the currently existing laws, there are questions of inadequate awareness and compliance with the laws. Similarly, the existing laws and by-laws are disjointed and not harmonized. This research sought to establish gaps in terms of policies and the legal framework in a bid to make recommendations to seal any identified gaps. The inadequate harmonization effect, inadequate capacity and, generally the inadequate legal framework could be a factor that significantly influences mitigating buildings failures.

The institutions that have been put in perspective in this study includes the regulatory bodies and government agencies that are key stakeholders in building sector. These bodies and agencies include the National Construction Authority (NCA), Engineers Board of Kenya (EBK), and Board of Registration of Architects and Quantity Surveyors (BORAQS). Some unethical members for these bodies have been responsible for inadequate designs, non-adherence to approved designs and unprofessionalism in the execution of construction works (GoK, 2010). For the mentioned institutions, the question of capacity to undertake their mandates is of great concern to this study. The capacity is with regard to the availability of equipment and qualified personnel, which is key for the

execution of their mandates. The fourth variable that the study explored was the contextual framework which comprises the surrounding circumstances within which building occurs. This is important because building does not occur in a vacuum and there could be other factors which are non-technical in nature (Asante & Sasu, 2018). These factors include compromise in design, supervision and inspection of buildings, non-compliance with building policies, regulations and standards, professional ethics and bribery. The study considers these factors to have influence in all stages of building process and could therefore affect the quality of final product (Kioko, 2014).

Several cases of corruption and greed have on several occasions been reported on the part of both the regulatory bodies and property developers, who set aside the adherence to the building code of conduct in a bid to make quick money. Issues of morality feature within this context because even with the existing policies and institutions governing the industry, there is an apparent disregard for adherence to the set standards by clients, professionals and the regulatory agencies.

2.4 Empirical Review

Material weaknesses and choice as well as manufacturing faults may lead to unreliable structural materials including centrally blended concrete or substandard structural steel (Yilmaz & Çelebi, 2015). Moreover, natural factors such as rainfall, atmospheric pressure and changes in temperature may facilitate collapse of poorly constructed buildings. Heavy downpours, for instance, may cause uncompleted or completed building to collapse when lines of weaknesses exist (Keable & Keable, 2011). Thus, it is recommended that construction professionals should involve proper quality management, thus keenly considering the likelihood of all possible natural disasters throughout the lifecycle of construction (Drennan, McConnell, & Stark, 2014).

In Africa, the problem of collapsing buildings has been incessant, Structural failure, inadequate supervision and workmanship, faulty designs, carelessness, use of substandard construction materials, and hasty construction have been the prevalent causes of

collapsing buildings (Bosede & Sunday, 2014; Fagbenle & Oluwunmi, 2010). In Ghana, the problem of collapsing buildings and retrogression in the safety of built environment has been witnessed (Botchway, Afram & Ankrah, 2014). It is unfortunate that these incidents have been rampant, despite modern construction technology. Various buildings, such as commercial complexes, transmission masts, factories, classrooms, and private houses have been collapsing in different parts of Ghana due to shoddy work, inadequate supervision, lack of commitment to the shelter delivery and construction regulatory bodies, and inaccurate reproduction of engineering and architectural details (Botchway, Afram & Ankrah, 2014). Noncompliance with regulations, poor supervision, poor inspection regimes and illegal conversions otherwise called change of user are central factors in the cause of building failures. A breakdown between the law and enforcement is a breeding ground for building malpractices which eventually lead to building failures, (Wardhana, 2003). When contractors make alterations to design without consulting project engineers the building is exposed to the risk of failure either during or after completion, (Ratay, 2005). Many buildings which end up collapsing have weak structural designs and some can be seen leaning even during construction. Through corruption, such buildings are allowed to continue eventually coming down to cause injuries or loss of life.

Wade (2010) identifies building maintenance as a key component in preventing building failures. Poorly maintained buildings are more likely to fail due to neglect of wear and tear on the building components. Building maintenance schedules should be followed in order to ensure buildings do not age faster than anticipated giving in to small repairs which should have been noted in the course of daily operation of the building. Mutiso (1996) agrees that some buildings such as sunbeam building in Nairobi could have come down due to infestation by white ants which is a maintenance issue that could have been prevented to avert the loss of life and property. Property management involves regular inspections for defects and proposal of remedial measures to prevent fatal deterioration and eventual collapse.

In Kansas City, Missouri, the United States, the walkways of the Hyatt Regency Hotel collapsed, killing about 114 people and injuring 200 (Banset & Parsons, 1989). The

walkways collapsed due to a modification in design. Despite the changes, there was no adequate communication between the contractors and design engineers during the alteration of the design, leading to weak support rods of the walkways. This failure was mainly due to breach of quality management practice that demanded that decision-making process for a change in a building's design should involve all relevant parties. The failure of the walkways serves as a case study of professional courses worldwide and is valuable in training on the significance of professional ethics (Banset & Parsons, 1989).

Maina and Awuor (2020) bring out a clear picture of organized development control in Malaysia and explains in detail the pre-requisites for approval of building plans which include stringent checks for design failures and weaknesses which could lead to collapse of buildings under construction or during occupancy.

This ensures that past mistakes leading to losses are not repeated and lessons are documented for posterity. The study also highlights common causes of building failures in Malaysia as to include the following; bad design, faulty construction, foundation failure, extraordinary loads, unexpected failure modes or combination of causes (Assaf, Hassanain & Abdallah, 2018).

While studying causes of building failures in Nigeria, Otanitori (2011) found that the quality of sand used in making concrete has a bearing on the strength of building components such as beams and columns made using such concrete. The study found that excess clay content makes the resultant concrete mixes vulnerable and subsequently unable to hold for long. Adeoye (1998) and Amanda-Ayafa (2000) found that 38 buildings collapsed within 20 years between 1976 and 1995 but the rate of collapse picked up to reach 8 buildings between 2005 and 2006 in southern Nigeria. The studies found that all the buildings which collapsed came down due to wrong concrete strengths. Mosley *et al.* (2007) and Olotuah (2005) supported these findings.

In Kenyan construction industry, over the decade, over 14 buildings have collapsed leading to loss of both life and property (Hannah *et al*., 2014). Studies have been

conducted, with majority of the studies pointing at contributing factors such as low quality construction materials. For example, the amount of impurities such as clay, silt, and organic impurities in building sand has an effect on the resulting concrete compressive and bonding strength (BS 882, 1992). Various standardizations give various allowable percentages of impurities and the duty of offering monitoring of the standards lies squarely with the Kenya Bureau of Standards (KEBS). However, in general, the allowable content of such deleterious materials should not exceed 5% (Hannah *et al*., 2014). Koech (2001) argued that local governments have the sole privilege and mandate of ensuring safety and preempting building failures by exercising their supervisory roles in the construction industry. Nduthu (2012) found that county governments having inherited the defunct local authorities required extensive capacity building in terms of institutional support to be able to carry out the mandate of development control.

From the study of Hannah *et al*. (2014), it was established that in Nairobi County and its environments, 86.2% of tested sand samples did not meet the allowable maximum impurity contents as spelt out in BS 882 standards. The research asserts that this high level has compromised the integrity of the constructions and could be a cause for collapse of building. As a recommendation to iron out this lack of adherence to standards, Hannah *et al*. (2014) were of the opinion that there is need for improved construction management practices. The professionals within Kenya's construction industry need to enhance inspection of materials for quality purposes. If done, this was deemed to help in avoiding the increased collapses that are projected for the coming years (Hannah *et al*., 2014) and singled out poor structural design as a rampant cause of failure of buildings while also bringing out the issue of extra ordinary loading due to buildings being used for the purposes for which they were not designed. Unchecked change of use of buildings could also cause the buildings to collapse under weight of the new use. Developer's malpractices such as reducing levels of concrete mix ratios and downgrading steel requirements to cut cost also cause buildings to eventually give in.

In Mumbai 100 buildings collapsed in the city due to factors ranging from heavy downpour to substandard materials used in the subject buildings. These collapses

occurred between 2008 and 2012 and were studied in two phases expanding the causes to include factors like poor workmanship, poor supervision, poor concrete works and mixes as well as poor concrete curing processes, (Bangi & Haris, 2013). Krishnayya (2011) documented the causes of the failure of buildings to include inadequate overlap length of steel rods as well as inadequate number of columns and their spacing and concludes that unsymmetrical wall loads on structures is a major cause of buildings failures. Weak foundations as in a case where columns are based on filled up wells or quarries could result into collapses. Excess deflections and incorrect steel fabrications are causes of collapse of buildings (Chowdary 2011). Other documented causes of building failures include design omissions, poorly skilled building inspection workers, lack of experience on the side of contractors, compromises in the professional ethics, complexity of building code, miscalculations, omissions in drawings and compressed designs (Constructor, 2011). Common causes of building collapses in India include poor workmanship and incompetent supervision of construction works as well as professional compromises and developers' decisions to skip professional involvement at all stages from design to implementation. Complexity of building codes leading to misinterpretation as well as unchecked or unconfirmed calculations were also found to compound the challenge of collapsing buildings. Impatience with contractors which causes inadequate curing of concrete also causes buildings to collapse, (Kharna, 2013).

Wardhana (2003) studied the importance of strong institutional framework in preventing building failures while looking at causes of building collapses in Asia and points out lack of skill in inspecting ongoing construction works as well as lack of coordination among the involved arms of government. A breakdown between law enforcement and standards forms a large loophole which developers use to circumvent requirements for structural integrity in construction. For various reasons, including cost cutting, developers choose cheap materials and disregard what the professional have prescribed eventually leading to failures. Building designs are also altered along the way and since supervision is hardly sufficient or competent, the changes go unnoticed, no calculations are done to accommodate such changes resulting to deficiency which give way to structural failures,

(Ratay, 2005). These setiments are echoed by Kioko (2014) who points out several causes of building failures in Kenya including that poor workmanship, noncompliance with reinforcement specifications, cost cutting tendencies by contractors, inadequate planking, substandard materials, wider column spacing, high slenderness ratio, incompetent contractors, faulty construction methodology and poor choice of materials.

Although building maintenance has not been documented widely as a key cause of failure of buildings, Wade (2010) points it as one of the very critical areas requiring focus in addressing building failures. Regular inspection of buildings to identify structural cracks, bending or surging of columns as well as possible infestation of components by dangerous insects or conditions such as damp are required periodically. Establishing a proper quality management framework in the construction industry is an important alternative to reduce the risk of collapsing buildings. Stringent measures are necessary to determine appropriate solutions to avoid future occurrences. Collapsing buildings, both uncompleted and completed, have caused loss of lives and property among the builders and occupants (Ayodeji, 2011).

Chattered Institute of Building Surveyors (2010) lays a lot of emphasis on corruption as a major cause of building failures in that sound technical and professional practices are sacrifice for personal gain. The institute cites compromise of approvals, inspections and supervision as a major factor in causing building failures. Buildings which are approved irregularly and are not inspected in accordance with laid down regulations are highly likely to fail. It is even worse when signs of failure begin to emerge because with corruption, even proper documentation of the building process is not easy to come across. Kioko (2014) recommends use of local building codes, employment of qualified professionals and contractors, increased supervision and inspection and improved governance in construction industry to eliminate corruption.

National Corruption and Ethics Survey (2015) placed abuse of office as a form of corruption in Kenya at 54% while projects implementation rested at 41%. This combination might as well explain the building failures in Kenya where undue influence

is exerted in approving projects one can expect shoddy implementation or near total disregard of relevant applicable regulations. In the county governments segment, where approval of building plans, inspection of construction work and development control falls, corruption in the physical planning departments was highest at 14% and only second to health departments at 29%. The building process in Kenya right from conception to implementation presents great incentive and inclination for corruption especially at the approval stage due the huge volumes of applications presented to incompetent and lean staff at county development planning departments. Reasons for building failure includes corruption and bureaucracy, lack of capacity to implement plans and scrutinize development proposals making compliance minimum or non-existence, (Rosetto, 2016).

2.5 Critique of Reviewed Literature

In Africa, various scholars including Kioko (2014), Chendo and Obi (2015) have conducted studies to establish the causes of building failures and found natural factors to play significant roles in causing building failures. However, the mitigation of natural factors should be well articulated in sector policies, regulations and inspection by mandated institutions for purpose of compliance. Oloyade (2010) and Madu (2005) list various causes of building failures in Nigeria and Ghana which include earthquakes, floods, typhoons and tornadoes and term them to be the key causes of building failure. However, these causes relate to breakdown in governance structures to apply existing laws and regulations and standards which design and construction must attain against such climatic conditions.

Olanitori (2011) discusses issues of strong foundations and concrete mixture failures as causes of building failures. This is a governance issue where institutions lack material tests, capacity and supervision to make sure no use of substandard material.

Ali (1990) and Abdalah (2011) conducted studies in Asia and particularly Malaysia and India to determine causes of building failures even before construction begins. They argue that in as much as natural factors can play a significant role during and after construction,

design omissions are more fatal and if not detected can lead to fatalities. However, this should be contained in policy and legal provisions and institutions tasked with the responsibility should undertake periodical inspection to detect such weakness.

Basset (2016) and Chowdary (2011) focused their studies on the causes of building failures in Europe and the USA and concentrate on technical issues leaving out institutional and organization factors which lead to lapses in the building process efficiency. Even though the study list material weaknesses, harsh climate, poor design and poor supervision of works, as causes of building failure, these can only be resolved where there is a proper governance framework with clear policies, laws and institutions to implement and enforce sector laws.

The Sri Lanka Construction Industry Development Act (2014) establishes the framework for policy and legislative provisions for the management of the construction industry which covers virtually all aspects of building process. The Act carries the provision for setting of policy to guide the development of attendant legislation so that all laws are anchored on solid policy. The National Construction Development Council established under the Act has the sole duty of developing policy for the sector. National Construction Development Authority whose sole mandate is to implement the policy is also established by the Act to ensure full implementation of the National construction policy.

Maina and Awuor (2020) carried out studies on the development control regime in Malaysia and brought out a clear picture of organized development control. The study has gone to great length to detail the pre-requisites for approval of building plans which include stringent checks for design failures and weaknesses which could lead to collapse of buildings under construction or during occupancy. Ali (1990) also carried out a study to examine the preconditions for development approval in Malaysia and highlights some of the critical information required for a development proposal report. This study portrays the picture of a well-organized supervision system with checkpoints to preempt building failures.

2.6 Research Gap

A critical review of past literature shows that there exist several contextual and conceptual gaps in the influence of governance framework on mitigating building failures. Yilmaz and Çelebi (2015) conducted a study on the causes of building failures in India and concluded that most structural failures positively and strongly correlate with the low-quality construction materials, wrong construction procedures, poor workmanship, and professional malpractices. There exists a conceptual gap because the study did not go to the depths of explaining how institutional and policy issues may affect the quality of construction material and methods. The study does not deal with the role of policy and legal enforcement and the need for coordination of the various efforts to ensure quality materials and workmanship are sustained. The study does not address weak legal system as being a bottleneck that can cause selective application of guidelines leading to failures. There also exists a geographical gap since the study was carried out in India and not in Kenya.

Chendo and Obi (2015), Olagunju, Aremu and Ogundele (2013) and Oloyode (2010) conducted studies on the causes, effects and consequences of building failures in the Nigerian context and found that noncompliance with regulations, poor supervision, poor inspection regimes and illegal conversions otherwise called change of user were responsible for building failures. There exists conceptual gap because the studies do not point out what the law provides and do not also explain whether the failures were as a result of neglecting legal provisions. The studies do not also explain what causes the inefficiencies in supervision as well as the causes for noncompliance with regulations. The studies do not explain how change of user is related to the causes of building failures and they leave glaring gaps which touch on institutional and policy issues. The study is conducted in Nigeria while this study was conducted in Kenya.

Mutiso (1996) investigated the causes of the collapse of sunbeam building in Nairobi and documented lack of capacity within local governments, poor workmanship and unqualified persons being involved in construction as well as lack of regular inspections

as being the major causes. The study was conducted before the enactment of the new constitution in 2010 which placed the mandate of policy formulation to the National Government while planning and development is a function under County Governments. When the study was conducted, the National Construction Authority and National Buildings Inspectorate were not in place but have since been established to the institutional framework for the sector. Additionally, the high rate of urbanization attributed to devolved system of governance has caused an increase in the number of high rise buildings being developed across the 47 County Governments.

There exists a time gap because the context of this study was in the old constitution dispensation which focused on local authorities as focal points in inspection and supervision of building construction. The constitution has since been reviewed to accommodate devolution and the new system of governance even in the building industry. New technologies, materials and standards have also emerged further complicating the process of building and the study could not have captured the challenges associated with new technologies and materials as well as the new system of construction supervision. The study does not address how the Constitution, written law and regulations interact in the context of supervision and implementation to prevent building failures.

Ahzahar (2011) conducted a study on the causes of building collapses in Malaysia singled out heavy down pour, strong winds and saline water conditions which wear out metallic building components as being major contributors to the collapses of buildings. The study concludes that location of buildings near swamps or in close proximity to the sea could also expose them to imminent failure. However, there exists a conceptual gap because the study does not explain how the location of buildings, design of buildings and even choice of materials can be checked under the law or regulations or institutions and even standards. The study does not say whether there existed policy guidelines which were flouted or whether there was capacity to detect such mistakes during design and siting of buildings so as to preempt failure. The study does not talk about the existing institutions and the tools and instruments as well as powers given to supervise and implement building

standards. There also exists a contextual gap since the study carried out in Malaysia and cannot fit effectively in the Kenyan legal and regulatory framework.

Ayedun, Durodola, and Akinjare (2011), conducted studies on the causes of building failures in Nigeria and focused on material strength as well as technical specification disregard by builders as being the major causes of building failures. There is contextual gap since the studies are carried out in Nigeria respectively which is in West Africa while Kenya is in East Africa. The conceptual gap in this case is that the studies only focus on scientifically verifiable causes leaving out the aspects of human effort and error in design, coordination and implementation of the law. They do not mention the existing policies and laws as well as regulations making it difficult to generalize and apply in Kenya.

Banset and Parsons (1989) and Subramanian (2009) conducted similar studies in the United States of America and China respectively and their findings on causes were material weaknesses, design weaknesses, poor supervision and lack of professional input at all stages, their studies were done outside Kenya leading to geographical and contextual gap. The studies focused on the technical aspects leaving out explanations on the existence of policy, institutions and legal systems which work systematically to manage the causes of building failures. Building process is a system which requires synergistic efforts from all stakeholders including government, developers and contractors as well as professionals. There also exists a cultural and contextual gap since the studies reviewed were conducted in the United States of America and China while this study is focused in Kenya.

2.7 Summary of the Chapter

The Chapter reviewed the various theories that explain the independent and dependent variables and starts with system theory that posits that the performance of the whole is greater than the sum of the performance of its parts. It is based on the assumption that everything is part of a larger inter-dependent arrangement and each system is a sub system of the system above it. The theory helps to understand building process as a system from

conceptualization or design stage to decommissioning. It also helps to understand interlink ages between policies, regulations framework and institution of governance mandated to implement building policies. The Power Elite theory posits that governance is by a class of people in position of power in society, policies and decision making is made by some group for their benefit. The Theory explains why policies and regulations may not be adequate to address the entire building management. The Deontological Theory recognizes that law and morality are deeply connected but are not one and the same. The theory describes duties that people have towards one another. Professionals in building sector carries a high levels of integrity in design and supervision of construction works and owe duty of care to occupiers of such buildings. High levels of morality and ethics should be inculcated in building sector to curb building failures. The Institution theory asserts that the Institutional environment can strongly influence the development of formal structures in an organization often more profoundly than market pressures, innovative structures that improve technical efficiency in early adopting organization are legitimized in the environment.

The theory helps in understanding the institutions governing the building sector and how they are organised to implement the policies and regulators within the building sector. The Chapter also posits the conceptual framework which is presented diagrammatically, the independence variables showing the specific constituents that influence a particular variable. For instance, the Policy framework is influenced by the existing and adequacy of the Policy, enforcement, compliance, clarity and awareness. Legal framework is influenced by existing laws, regulations, sanctions and penalties stipulated in the regulations, enforcement and legal conflict while the institutional framework is influenced by existing institutions of governance in the building sector, their capacity to implement policies and regulations supervision/inspection as well as institutional conflict. Contextual framework comprises of compromise in the building process, non-compliance with the building standards/code and professional ethics. The dependant variable is depicted by performance and structural failures as well as total collapse of buildings.

The chapter also undertake empirical review on causes of building failures which includes inadequate inspection by both professionals and institutions mandated to undertake periodical inspection at various building stages, lack of adherence to existing policies and regulations and consequently lack of the same. Professional negligence in design and supervision, compromise in building approval process, use of unqualified contractors and use of substandard materials. Finally, there is a critique of the literature review and from the contextual and conceptual critique the research gap is identified.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This Chapter discusses the methodology used which includes; Research design, Research Philosophy, target population, sampling frame, sample and sampling technique, data collection instruments, data collection procedure, pilot testing and data processing and analysis methods adopted.

3.2 Research Design

A Research design refers to how data collection and analysis are structured in order to meet the research objectives through empirical evidence economically (Bordens, & Abbott, 2002). Cooper and Schindler (2007) view it as the plan and structure of investigation so conceived as to obtain answers to research questions. It is the conceptual structure within which research is conducted and constitutes the blueprint for the collection, measurement and analysis of data (Kothari, 2011). The research design tries to answer immediate questions concerning a current state of affairs (Mathews & Kostelis, 2011).

The study used both descriptive and correlational research designs. The major purpose of descriptive research is description of the state of affairs as it exists. Kombo and Tromp (2014) opine that descriptive studies are not only restricted to fact findings but may result in the formulation of important principles of knowledge and solution to significant problems.

The correlational design enables one to assess the degree of relationship that exist between the two or more variables. It analysis the correlation between two or more variables (Orodho, 2003). The research designs are appropriate to this study since it sought to establish the relationship between policy, legal, institutional and contextual framework

and their influence in mitigating building failures using correlation and regression analysis.

3.2.1 Research Philosophy

It is a system of beliefs and assumptions concerning the development of knowledge. Philosophy is precisely what you are doing when embarking on research and not limited to developing knowledge in a particular field that tend to answer a specific problem in an organization. Research philosophy is classified as ontology, epistemology and axiology (Saunders, Lewis, & Thornhill, 2009). Ontology is based on the nature of reality. Being classified on the basis of objectivism and subjectivism. Objectivism ontology portrays the position social objects tend to persist in reality. Subjectivism concerned with the social phenomena emerging from the perceptions and consequences of social actors.

Axiology is the branch of philosophy dealing with the study of principles and values and further narrowed down into: ethics and aesthetics. Ethics deals with questioning of morals and personal values while Aesthetics deals with examination of what is beautiful, enjoyable, or tasteful. The theory of axiology stressed that education is more than just about knowledge but deals with quality of life and how life should be lived.

Epistemology is the understanding of acceptable knowledge of a particular area of study. Epistemology is divided into two aspects; resources researcher and feeling researcher. The ‘resource researcher’ deals with the data from the perspective of natural scientist while ‘feeling researcher’ is concerned about the feelings and attitudes of the workers towards their managers and focuses on three elements (realism, Interpretism and positivism).

The study design was guided by positivism philosophy which deals with the observable social entity and the approach is on the basis of data collection and hypothesis development based on the research objectives. Positivist researcher follows highly structured methodology in order to facilitate the hypothesis and in addition works on quantifiable observations through the use of statistical analysis. Positivists consider reality

as stable and can be observed and described from an objective viewpoint (Levin, 1988), without alter with the phenomena being studied. The research philosophy is aligned with the research design in that the research deal with data collection, data analysis, objectives hypothesis testing and reporting of the findings

3.3 Target Population

Population refers to the total number of people or items whose characteristics a researcher wants to establish (Saunders *et al*, 2012). The population for this study was drawn from both the National Government, and representation from eleven (11) County Governments. Under the National Government, the study aims to gather information from officers of the National Construction Authority (NCA), National Building Inspectorates, Kenya Bureau of Standards, Professional Bodies and Officials of the Ministry of Transport, Infrastructure, Housing, and Urban Development. Also, the study included officers from the County Government, and particularly from the departments of planning, compliance and enforcement.

The eleven counties selected is informed by a number of factors. The study has taken into consideration a representation of counties that have been worst hit by cases of building collapses, revolving around the cities within Kenya, which include Nairobi, Mombasa, Kisumu and Nakuru. These cities have experienced mushrooming of high-rise buildings, in a bid to counter the exponential rise of housing demands within them. Such cities have similarly experienced high frequencies of incidences of building collapses. The study also looked into the geographic distribution of the counties to capture the various aspects of operation environments, thus adequately representing the country. Spanning the former eight provinces within Kenya, such as Kakamega, Machakos, Garissa, and Kiambu, The unit of analysis in this study was individual's response across the above-mentioned institutions based on their views regarding governance framework on mitigating building failures. The study involved a target population of eight hundred and seventy-seven (877) respondents, whose breakdown as shown in Table 3.1 and Table 3.2.

Table 3.1: Breakdown for Target Population in National Government

Institutions	Respondents
National Construction Authority	15
National Building Inspectorate	10
Kenya Bureau of Standards	20
Professional Bodies	
BORAQS	8
EBK	8
Ministry of Transport, Infrastructure, Housing & Urban Development	
Department of Engineering (structural)	40
Department of Engineering (Mechanical)	39
Department of Engineering (Electrical)	34
Department of Materials Technology	30
Department of Architecture	42
Department of QS	30
Department of Housing	20
TOTALS	**296**

Source: Human Resource Unit from respective institutions (2017)

Table 3.2: Breakdown for Target Population in County Governments

County	Respondents
Nairobi	90
Mombasa	77
Kisumu	87
Nakuru	63
Kiambu	83
Kisii	37
Kericho	35
Machakos	30
Uasin Gishu	23
Kakamega	40
Garissa	16
TOTAL	**581**

3.4 Sampling Frame

A sampling frame is a list of population units from which elements to be sampled are selected (Gill &Johnson, 2002). Denscombe (2003) emphasizes that a good sampling frame should be relevant, meaning that it should contain things directly connected to the research topic, be complete by covering all relevant items, and be precise and up to date. Considering the subject of policy, legal, institutional and contextual framework and their subsequent influence on mitigating building failures in Kenya, the sampling frame of the study was drawn from both the National and County Governments. From the National Government, the study involved officers from the National Construction Authority (NCA), National Building Inspectorate (NBI), Kenya Bureau of Standards (KEBS), Board of Registration of Architects and Quantity Surveyors (BORAQS), Engineers' Board of Kenya (EBK), and various Departments within the Ministry of Transport, Infrastructure, and Housing & Urban Development.

The study incorporated the above institutions because they primarily deal with the building sector in their routine operations and in a position to fully understand the sector. From the mentioned target institutions, the study involved senior officers with relatively high experience in the building sector, well versed with the laws and policies guiding the sector. Similarly, the study involved quality assurance officers whose mandates are ensuring that the laid down procedures for the sector are adhered with by developers and other building sector stakeholders.

3.5 Sample and Sampling Technique

According to Gay (2005), Sample and Sampling technique is the act or process of selecting a suitable sample, or a representative part of a population for the purpose of determining parameters or characteristics of the whole population. This was broken down as follows;

3.5.1 Sampling Design

Refers to the approaches used in the selection of an appropriate sample from the study population (Kothari, 2014). The various approaches to sampling design include the sampling frame, sampling technique, and sample size.

3.5.2 Sample Size

A sample size is the number of observations included in a statistical sample. It is an important feature of any empirical study whose goal is to make conclusions about a population. The choice of sample size is regulated by: level of certainty of the collected data to be representative of the total population; accuracy required as basis of estimates made for the sample; type of analysis that was used and; size of the total population from which the sample was drawn (Fox & Bayat, 2007). The sample size is determined based on the expense of data collection, and the need to have sufficient statistical power. A better representative of the sample size is characterized by precise margin of error between 1-5% which helps in effecting generalizations (Saunders *et al*., 2012).

For this study, the sample size was determined by the proportion of policy makers, law enforcers, quality assurance officers in the various relevant target institutions; the desired confidence level of 95%. The required sample size was calculated by:

$n = \frac{N}{1+N(e)^2}$ Where:

N = target population

$n = required\ sample\ size$

$e = Level\ of\ precision$ (5% $level\ of\ significance$) Yamane (1967)

For the case of this study, and with the target population (N) of 877, the sample size was thus calculated as:

$$n = \frac{877}{1+877(0.05)^2} = 275\ respondents$$

The sample size was calculated to establish the number of respondents targeted for each institution. With the aid of the known population for each institution, the formula was incorporated to generate the required size. Since the statistics for each institution regarding mean, standard deviation and variance was unknown, the study resorted to randomization to select the appropriate respondents. This approach was chosen because in it, each element of the different strata had an equal chance of being selected. The sample selected from the randomization process was a representative of the population of the group. During the randomization process, secondary data was requested from the target institutions in form of employee list. Each employee was assigned a number, and by use of an Excel document, random numbers were generated from which the respondents for the sample were identified.

Table 3.3: Sample size for the National Government

Population Strata	**Target population**	**Sample Size**
National Government		
National Construction Authority	15	5
National Building Inspectorate	10	3
Kenya Bureau of Standards	20	6
Professional Bodies		
BORAQS	8	3
EBK	8	3
Ministry of Transport, Infrastructure, Housing & Urban Development		
Department of Engineering (structural)	40	13
Department of Engineering (Mechanical)	39	12
Department of Engineering (Electrical)	34	11
Department of Materials Technology	30	9
Department of Architecture	42	13
Department of QS	30	9
Department of Housing	20	6
TOTALS	**296**	**93**

Source: Author (2017).

Table 3.4: Table of Sample Size for the County Government

County	Target Population	Sample Size
Nairobi	90	28
Mombasa	77	25
Kisumu	87	27
Nakuru	63	19
Kiambu	83	27
Kisii	37	11
Kericho	35	11
Machakos	30	8
Uasin Gishu	23	7
Kakamega	40	13
Garissa	16	6
TOTAL	**581**	**182**

Source: Author (2017).

The total sample size = 182 + 93

= 275

Respondents from key professional bodies related to the building sector have also been chosen for the data collection for this study. The selected regulators include BORAQS and EBK. The selection was informed by the target respondents interacting daily with the building environment and their vast knowledge of experience in the sector. From the State Department of Public Works, the respondents included officers from the departments of engineering, architecture, and quantity surveying and also from Department of Housing from State Department of Housing and Urban Development. Respondents from the County Governments included officers involved in the quality assurance exercise, and those from the departments of planning, compliance and enforcement.

3.5.3 Sampling Techniques

Sampling techniques describes the different sampling methods. This study used both probability and non-probability methods of sampling. The non-probability method

adopted entailed purposive sampling while for probability technique a stratified sampling technique was used. In asserting this method, there was categorization of the population members according to convenient non-overlapping categories (Cavaye, 1996). The method is also essential during the selection of samples from different categories. In undertaking this approach, every unit of the research population has an equal chance of being selected in relation to their proportion in the entire population (Denscombe, 2003). Denscombe (2003) asserts that the method is instrumental in allowing the researcher assert some control over the selection of the sample with the aim of guaranteeing that crucial factors or crucial people are covered by the selection, and in proportion to the manner they exist within the wider population.

For the County Government, the study adopted a purposive sampling method whereby 11 counties were selected from 47 counties. These counties are Nairobi, Mombasa, Kisumu, Nakuru which are cities having recorded high cases of building failure due to high population increasing demand for building in these cities including high rate of urbanization and high rise building, Kiambu, Kisii, Kericho, Machakos, Uasin Gishu, Kakamega and Garissa Counties these were considerd to represent the former provinces and geographical distribution. In each County each employees was a signed a number and by use of excel document, random numbers were generated from which respondents from the sample were identified.

3.6 Data collection Instruments

The instrument for data collection was a questionnaire which was administered to sampled respondents. The structure of the instrument included both closed-ended and open-ended questions. The questions revolved around the independent and dependent variables as structured from B to G in the questionnaire and was administered to relevant respondents in respect to their responsibilities in the building sector. The scope of the questions were ascertaining the respondents' perceived reasons for the exponential growth of the building failure in the Kenyan environment, respondents' knowledge on: the current building code, national housing policy, the building sector legal framework and contextual framework.

This was in a bid to understand the perceived sector organization and seek for loop-holes that was filled to avert building disasters. Likert's 5-Point Scale guided the construction of the questionnaire. According to Stangor (2015), the scale consists of a series of items showing agreement or disagreement on an opinion based on the study questions, each with a set of responses on which the respondents answer. The Likert's scales aim was to measure the extent of a respondent's agreement with each item on a five-point scale from very dissatisfied to extremely satisfied, with the items assigned values from 1 through to 5 in that order

3.7 Data Collection Procedure

The research procedure included obtaining an authorization from the University to conduct research. Also, the researcher requested for a Research Permit from the National Commission for Science, Technology and Innovation (NACOSTI). Permission was then requested from the management of the target institutions to allow administration of the questionnaires to the relevant respondents. Accordingly, the research tool included an attached introductory letter from the university meant to facilitate the acceptance by both the respondents and their respective organizations. The researcher recruited research assistants to assist in data entry and other logistical assignments. The enumerators were trained to enhance their competence and minimize as much as possible data collection and data entry errors.

3.8 Pilot Testing

The questionnaire tool was pilot tested to refining the questions before administering in the actual study. According to Mugenda and Mugenda (2003), pilot testing may be done to 1% to 10% depending on sample size, therefore study adopted 10% which is twenty-seven (27) respondents. The test was done to detect weakness in design and implementation, as well as to provide proxy data for the selection of a probability sample. Upon the pilot study, analysis was done to ascertain the acceptability of the tool. The accuracy of data gathered largely depends on the data collection instruments regarding

reliability and validity (Mugenda & Mugenda, 2003). The Questionnaire was pretested to 16 experts from the county governments and 11 experts from the National government who were encouraged to make comments and suggestions concerning instructions, clarity of questions and relevance. The results of the pilot study were useful in detecting errors and doing modification to the tool for the final data collection procedure.

3.8.1 Validity of the Instrument

Validity is the degree to which the test measures what it is supposed to measure. The questionnaire should be in line with the definition set in research. When a measure is reliable and valid the results can be utilized and understood (Elstak, 2013). Validity refers to the extent to which an instrument measures what is supposed to measure, data need not only to be reliable but also true and accurate. If a measurement is valid, it is also reliable (Mugenda & Mugenda, 2009).

The study used both face validity and content validity. To confirm face validity, the questionnaires were sent to 27 respondents to obtain suggestions for identification (Rousson, Gaiser & Seifer, 2002). On the basis of evaluation, the instrument was adjusted appropriately. The supervisors comments were also reviewed and incorporated to enhance validity.

Content validity was also used in the study to measure the appropriateness and the relevance of data collection instrument. The test was established by quantifying the viewpoints of key experts on legal, policy, contextual, and institutional issues. After the content examination in the questionnaire, a rating by the expert based on the content validity index was recorded. The evaluation confirmed that content was appropriate for the tool. Researchers have widely used content validity in various fields of study to establish relevance and consistency in data collection instruments. Zamanzadeh et al. (2015) introduced the need for instrument development through content validity. The authors provide an overview of the processes that entail content validity and identify the

process's intricacy through examples. Zamanzadeh et al. (2015) adopted both content validity index and scale validity to quantify the tool's relevance.

3.8.2 Reliability of the Instrument

The researcher used feedback from the pilot study to improve the design of the questionnaire. Similarly, the questionnaire was tested for reliability to ensure that it does not measure the same variable more than once. The Cronbach Alpha test was used to confirm the internal consistency of the questionnaire (reliability) (Mugenda & Mugenda, 2003). A score above 0.7 is critical because it indicates that the instrument is reliable while a maximum value of 0.9 has been recommended (Tarakal & Dennick, 2011).

3.9 Data Processing and Analysis

Data processing and analysis were done based on qualitative and quantitative methods as discussed below;

3.9.1 Qualitative Data Analysis

According to Tarakal and Dennick (2011) Qualitative data is the non-numerical information including audio, video recording and notes written by the respondents to supplement directional enquiries from the questionnaires. The qualitative data from the study was subjected to analysis, categorized, classified and tabulated to support the Quantitative data

3.9.2 Quantitative Data Analysis

Quantitative data was analyzed by use of the Statistical Package for Social Science (SPSS version 22). The software was key in designing data entry template, conducting data entry, cleaning and analyzing data. The quantitative data was analyzed by the use of descriptive statistics, diagnostic test and inferential. The descriptive statistics involved computation of mean, standard deviation and percentages. The test conducted under diagnostic test

involved sample adequacy test, normality test, multi collinearity test, test of linearity and homoscedasticity. Inferential statistics involved conducting correlation and regression analysis for determining relationships between the variables as given in various steps below:

Step 1: Descriptive Results

Descriptive statistics were computed to describe and summarize the findings of the study. Frequency tables were generated to provide the distribution of the respondent-based on various demographic aspect such level of education, gender, experience and age group. The measures of central tendency and variation were addressed through computation of means and standard deviations for policy, legal, institutional, contextual framework and mitigating building failures. The results supported the diagnostic test.

Factor Analysis: Factor analysis test was done in all the Likert scale tables for policy framework, legal framework, institutional framework and contextual framework. Before factor analysis test, there was a Kaiser-Meyer-Olkin test to establish if the available data meet the threshold for factor analysis test after which factor analysis was tested in all the variables of the study to reduce redundancy of the statements.

Step 2: Diagnostic Test

This was done to test the assumptions of linear regression.

Normality Test was done to determine whether the sample data was drawn from a normally distributed population of collected data using Shapiro-Wilk Test. Additionally, the use of histogram chart to show the distribution of data supported the results of Shapiro-Wil Test.

Multicollinearity Test was done using variance and inflation factor (VIFs) and tolerance levels to give the extent to which one independent variable can be expressed in terms of the other independent variables. That would imply that the independent variables are not truly independent of each other as assumed by fitting the model.

Test for Linearity: this test the assumption of multiple regression that the relationship between the response variable and the independent variables is linear. If this assumption is violated, the multiple regressions will try to fit a straight line to data that do not follow a straight line. To assess linearity, the primary concern was to observe the scatterplot of the standardized residuals with the standardized predicted values.

Homoscedasticity Test: The study had the homoscedasticity test evaluated for pairs of variables using the levene statistic for the test of homogeneity of variances. The test was used to confirm whether the variances in the set variables were equal.

The correlation coefficients: They were used to test the multi-collinearity of the collected data using the Pearson's where it gave the relationship between the study variables. A high correlation between the independent indicates presence of multicollinearity.

Step 3: Inferential Analysis

This involved correlation analysis to give the relationship between the variables of the study. It also involved multiple linear regression analysis where the relationship between the dependent variable and the independent variables was tested giving the extent to which each independent variables is related to the dependent variable. A simple linear regression analysis was conducted to assess the relationship between dependent and independent variable. Further, multiple regression analysis was conducted to establish the relationship between the policy, legal, institutional and contextual framework that mitigate building failures. Multiple Regressions Analysis was done to analyse how a number of covariates affect a specific response to variable (Cohen, West & Aiken, 2003). A multivariate

regression model was used to link both the independent and dependent variables as outlined below:

$$Y = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + e$$

Where:

Y = Mitigating Building Failure

α = Constant

Term β1, β2, β3, and β4= Regression coefficients of the independent variables (for policy framework, legal framework, institutional framework, and contextual framework respectively)

X_1= Policy Framework

X_2= Legal Framework

X_3= Institutional Framework

X_4=Contextual Framework

e = Error term

Using SPSS (version 22), a regression model was used to depict the relationship between the dependent variable and independent variables. The values of β1 to β4 were the coefficients that measures the sensitivity of the building failure to a unit change in the independent variable. F-test was done to test the significance of each independent variable at a confidence level of 95%. Similarly, p-value was computed to help in gauging the level of robustness of the model. The null hypothesis was rejected where the computed p-value was found to be less than 5% level of significance. And where p-value was found to be less than 0.05, it was concluded that the independent variable significantly affects the

dependent variable. Where computed P-value was found to be greater than the significance level (0.05), it was concluded that the model is not significant and cannot be used to explain the variations in the dependent variable.

Table 3.5: Operationalization of the Framework

Hypothesis	Independent	Test	Model
H_{01}: Policy framework has no significant influence on mitigating building failures in Kenya	Policy Framework	Simple regression, reject if p<0.05 or otherwise accept	$Y = \alpha + \beta 1X1$
H_{02}: Legal framework has no significant influence on mitigating building failures in Kenya	Legal Framework	Simple regression, reject if p<0.05 or otherwise accept	$Y = \alpha + \beta 2X2$
H_{03}: Institutional framework has no significant influence on mitigating building failures in Kenya	Institutional Framework	Simple regression, reject if p<0.05 or otherwise accept	$Y = \alpha + \beta 3X3$
H_{04}: Contextual framework has no significant influence on mitigating building failures in Kenya	Contextual Framework	Simple regression, reject if p<0.05 or otherwise accept	$Y = \alpha + \beta 4X4$

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents analyzed data together with discussions of the research findings. The purpose of the study was to establish the influence of Governance Framework in mitigating building failures in Kenya. Data was gathered through the administration of questionnaires and interpreted according to the research objectives. The data collected was both qualitative and quantitative in nature, which was analyzed using statistical Package for Social Science (SPSS version 22.0) where reports were generated then presented in the form of tables, charts and graphs.

4.2 Response Rate

The number of questionnaires that were administered were 275 where 93 of them were distributed to the officials at the National Government level while 182 distributed to the county government officials. A total of 206 questionnaires were duly filled and returned where 72 respondents were from the national government and the remaining 134 respondents were from county governments as indicated in tabe 4.1 and 4.2 respectively. This represented an overall successful response rate of 75% which is good enough to serve as a representative of the population. This conforms to Babbie (2004) asserted that response rates of 50% is acceptable to analyses and publish, 60% is good and 70% is very good and based on this assertion 75% response rate was found to be adequate for the study.

Table 4.1: Response Rate for the National Government with 72 respondents

Population Strata	Frequency
National Government	
National Construction Authority	4
National Building Inspectorate	2
Kenya Bureau of Standards	5
Professional Bodies	
BORAQS	2
EBK	2
Department of Engineering (structural)	11
Department of Engineering (Mechanical)	9
Department of Engineering (Electrical)	8
Department of Materials Technology	7
Department of Architecture	11
Department of QS	7
Department of Housing	4
TOTALS	**72**

Table 4.2: Response Rate for the County Government with 134 respondents

County	Frequency	Percent (%)
Nairobi	21	15
Mombasa	18	13
Kisumu	20	14
Nakuru	14	11
Kiambu	20	15
Kisii	8	6
Kericho	8	6
Machakos	6	5
Uasin Gishu	5	4
Kakamega	9	7
Garissa	5	4
TOTAL	**134**	**100**

4.3 Demographic Characteristics

The study analyzed the demographic characteristics of the respondents in terms of age brackets, gender, level of education, and profession to enable the researcher know the respondent's characteristics and assess whether the respondents possessed information relevant to the study in line with level of education and professionalism and the results were as follows;

4.3.1 Gender Composition of the Respondents

The respondents were asked to indicate their gender

Table 4.3: Gender of the Respondents

Gender	Frequency	Percent
Male	126	61
Female	80	39
Total	**206**	**100**

The results in table 4.3 reveal that majority (61%) of the respondents were male while 39% were female. This implies that most of the employees working in engineering fields such as Architectural and Structural work are male. The number of female however were more than 1/3 which implies that gender distribution was above the Constitution of Kenya (2010) threshold of 1/3.

4.3.2 Highest Level of Education of the Respondents

The respondents were asked to indicate their highest level of education.

Table 4.4: Highest Level of Education of the Respondents

Level of Education	Percent
Certificate	11
Diploma	42
Bachelors	34
Masters	12
Doctorate	1
Total	**100**

The results in table 4.4 reveal that majority (42%) of the respondents had attained Diploma level as the highest education level followed by the Bachelor's Degree (34%) while PhD level was the least with 1% ; having majority of the respondents as Diploma Holders as the highest education level indicate that most of the construction approval and supervision at the county level and national level are carried by the graduates from middle level colleges, implying that they have skills and understands the sector.

4.3.3 Number of Years in Current Employment

The respondents were asked to indicate the number of years they had worked in the current employment.

Table 4.5: Number of Years in Current Employment of the Respondents

Experience	Percent
0 – 1 year	10
1 to 3 year	18
3 to 8 years	30
8 years to 12 years	22
12 years to 15 years	13
15 years and above	7
Total	**100**

The results in table 4.5 reveal that 30% of the respondents had worked in their current employment between 3 – 8 years followed by those who had worked for between 8 – 12 years (22%). The results therefore indicate that majority of the respondents have adequate experience in the building sector as they had worked for more than 3 years. The study results can then be relied upon as the respondents have experience and knowledge in the building failures based on the duration, they have worked in the industry

4.3.4 Age of the Respondents

The respondents were also required to indicate their age.

Table 4.6: Age of the Respondents

Age	Percent
0 - 30 years	32
31-40 years	43
41-50 years	14
51- 60years	7
Above 60 years	4
Total	**100**

The results in table 4.6 reveals that majority of the respondents (43% n=87) were aged 31 – 40 years followed by (32% n=65) those who were aged between 0 – 30 years and above indicating that the participants were people of good age who are informed with the current issues in their carrier since majority of the respondents were between the ages of 30 – 40

years. This agrees with Jan and Stoeldraijer (2010) who asserted that the age of a person is directly proportional to their input in the work coupled with experience hence the longer employees stick with their organization, the more experienced they become with the working environment.

From this information, the researcher was also able to have confidence in the data collected since most respondents were experienced enough and had adequate relevance skills required to respond to the questionnaire.

4.4 Descriptive Statistics

Table 4.7: Descriptive Statistics

Variables	Mean	Standard deviation	Score
Policy Framework	3.58	1.165	72%
Legal Framework	3.87	1.103	77%
Institutional Framework	3.87	0.96	77%
Contextual Framework	3.9	1.137	78%
Mitigating Building Failure	3.83	1.029	77%

Descriptively, the score on the factors regarding mitigating building failure is recorded in the table 4.7. The descriptive results address the proportion of contribution of governance framework on mitigating building failures. From the findings, policy framework had a percentage score of 72% in mitigating building failure. The Legal and Institutional Framework score was 77%, while contextual framework recorded the highest score of 77% in mitigating building failure. The overall score on measures put across on mitigating building failures was 77%. Notably, the scores for all the factors were above average.

4.4.1 Reliability Analysis

Reliability of this instrument was evaluated through Cronbach Alpha which measures the internal consistency. Cronbach Alpha value is widely used to verify the reliability of the construct.

Table 4.8: Cronbach's Alpha

	Cronbach's Alpha	Comment
Policy Framework	.855	Accepted
Legal Framework	.792	Accepted
Institutional Frameworks	.815	Accepted
Contextual Framework	.826	Accepted
Mitigating Building Failures	.814	Accepted

The study findings in Table 4.8 on the pilot test showed that 'Policy Framework' scale had a Cronbach's reliability alpha of 0.855, 'Legal Framework' scale had an Alpha value of 0.792, 'Institutional Frameworks' scale had an Alpha value of 0.815, 'Contextual Framework' scale had a reliability value of 0.826 and 'Mitigating Building Failures' scale had a reliability value of 0.814. The pilot test showed that the scales measuring the objectives had a very high reliability and therefore no amendment on the objectives was necessary. This implied that the research instruments were adequate, objective and had reasonable internal consistency to give very reliable results. All variables depicted that the value of Cronbach's Alpha are above value of 0.7 which is acceptable (Castillo, 2009). This represent high level of reliability. v

4.4.2 Pre-Requisite Tests

The study performed tests on statistical assumptions that is test of regression assumption and statistic used. This included test of sampling adequacy, normality, multicollinearity, linearity and homoscedasticity. When the assumptions of the linear regression model are correct, ordinary least squares (OLS) provides efficient and unbiased estimates of the parameters (Kaiser, 1974).

4.4.3 Sampling Adequacy Tests

According to Cerny and Kaiser (1977), Kaiser-Meyer-Olkin (KMO) Test is a measure of how suited your data is for factor analysis. The test measures sampling adequacy for each variable in the model and for the complete model. The statistic is a measure of the

proportion of variance among variables that might be common variance. Sampling adequacy test was done to test the relevance and suitability of the factors. Kaiser-Meyer-Olkin Measure (KMO) of sampling adequacy and Bartlett's Test of Sphericity tests were conducted to establish data's sampling adequacy. KMO measure varies between 0 and 1, and values closer to 1 are better with a threshold of 0.5. Williams, Brown and Onsman (2012) stated that KMO of 0.50 is acceptable degree for sampling adequacy.

Bartlett's Test of Sphericity tests the null hypothesis that the correlation matrix is an identity matrix; that is, it analyses if the samples are from populations with equal variances. Bartlett's test significance of 0.05 or less indicates an acceptable degree of sampling adequacy. If sample is adequate and factorable then additional analysis beyond descriptive can be done.

Table 4.9: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.460
Bartlett's Test of Sphericity	Approx. Chi-Square	260.356
	df	10
	Sig.	.000

Table 4.9 presents the results of the sampling adequacy test. The KMO measures of sampling adequacy produced a value of 0.460 while Bartlett's test of sphericity had a consistent significance of $p < .005$ which depicted and confirmed sampling adequacy. A value of zero indicates that the sum of partial correlation is large relative to the sum of correlations indicating diffusions in the patterns of correlations, and hence factor analysis is likely to be inappropriate (Costello & Osborne, 2005). A value close to 1 indicates that the patterns of correlations are relatively compact and so factor analysis should yield distinct and reliable factors (Cooper & Schindler, 2011). The results of the test generated a p-value less than 0.05 implying that the variables in the questionnaire were adequate to be subjected to factor analysis.

4.5 Diagnostic Tests

The data was tested for conformity to the assumptions of the linear regression model by performing a normality test, multicollinearity and linearity test using SPSS version 22.

4.5.1 Normality Test

Normality tests was done to determine whether the sample data was drawn from a normally distributed population. Normality assessment can be done by using a graphical or numerical procedure. The numerical procedures include inferential statistics such as Kolmogorov-Smirnov and Shapiro-Wilk. According to Razali and Wah (2011), Shapiro-Wilk test assesses whether data is normally distributed against hypothesis whereby if statistic ranges from 0 to 1 and figures higher than 0.05 indicate the data is normally distributed. Kolmogorov-Smirnov test is considered appropriate for samples larger than 2000 while Shapiro-Wilk test is deemed appropriate for samples ranging from 50 to 2000. In this study, the usable response rate was 206 and hence Shapiro-Wilk test was used.

Table 4.10: Shapiro-Wilk

	Statistic	Df	Sig.
Policy Framework	.969	205	.060
Legal Framework	.744	205	.071
Institutional Frameworks	.615	205	.090
Contextual Framework	.848	205	.080
Mitigating Building Failures	.978	205	.067

A normality test was conducted using the Shapiro-Wilk test. The hypothesis for the test was formulated as follows;

Hypothesis

H_0 (Null hypothesis): The data was normally distributed

H_1 (Alternative hypothesis): The data was not normally distributed.

From the findings, all of the five factors were found to have a p-value greater than 0.05 hence the null hypothesis is accepted. Therefore, the population is normally distributed as indicated in table 4.10.

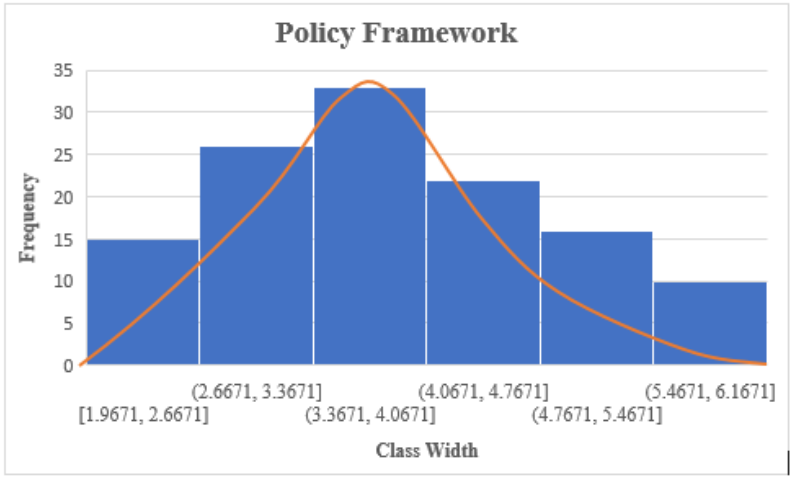

Figure 4.1: Normal Distribution for Policy Framework

Figure 4.1 gives the distribution for the policy framework where it indicates that the data for policy framework is normally distributed with a mean of 3.58 and a standard deviation of 1.165.

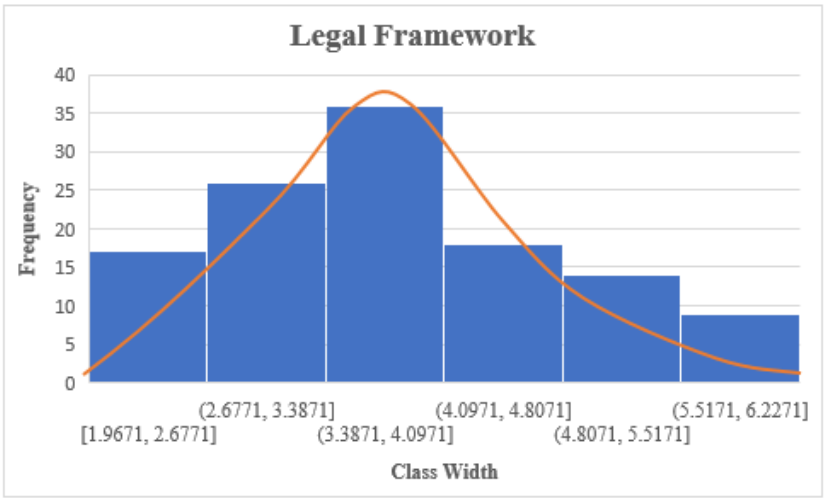

Figure 4.2: Normal Distribution for Legal Framework

Figure 4.2 gives the distribution for the legal framework where it indicates that the data for legal framework is normally distributed with a mean of 3.87 and a standard deviation of 1.103.

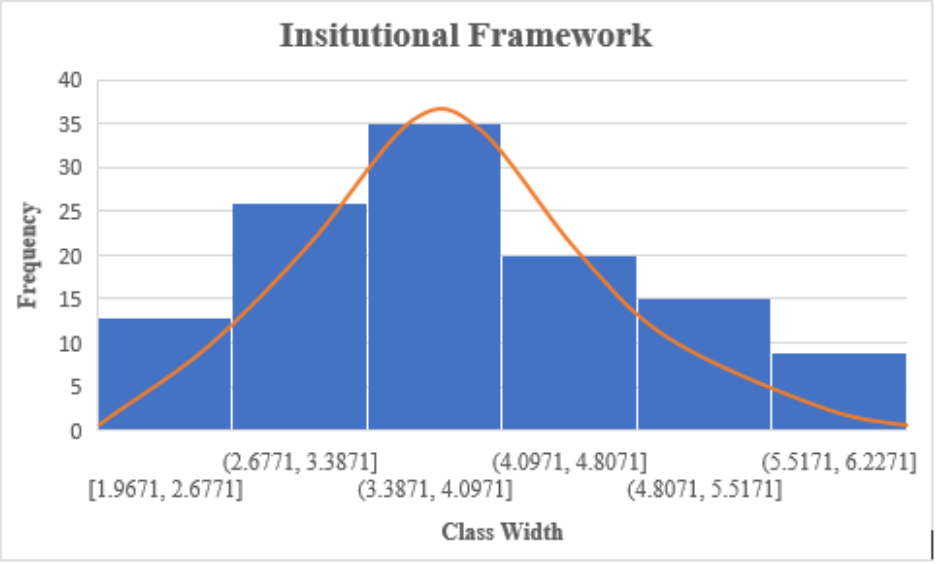

Figure 4.3: Normal Distribution for Institutional Framework

Figure 4.3 gives the distribution for the institutional framework where it indicates that the data for institutional framework is normally distributed with a mean of 3.84 and a standard deviation of 0.96.

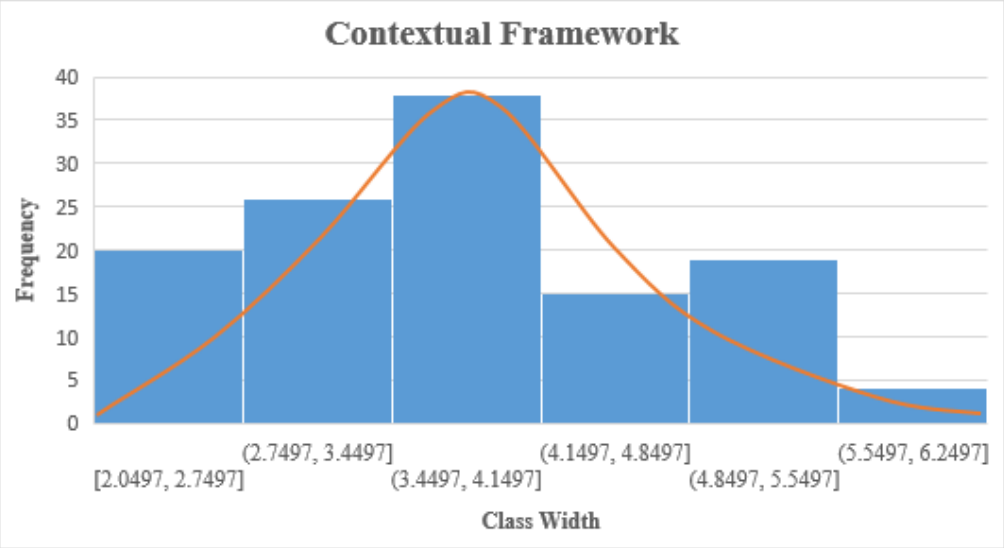

Figure 4.4: Normal Distribution for Contextual Framework

Figure 4.4 gives the distribution for the contextual framework where it indicates that the data for contextual framework is normally distributed with a mean of 3.90 and a standard deviation of 1.137.

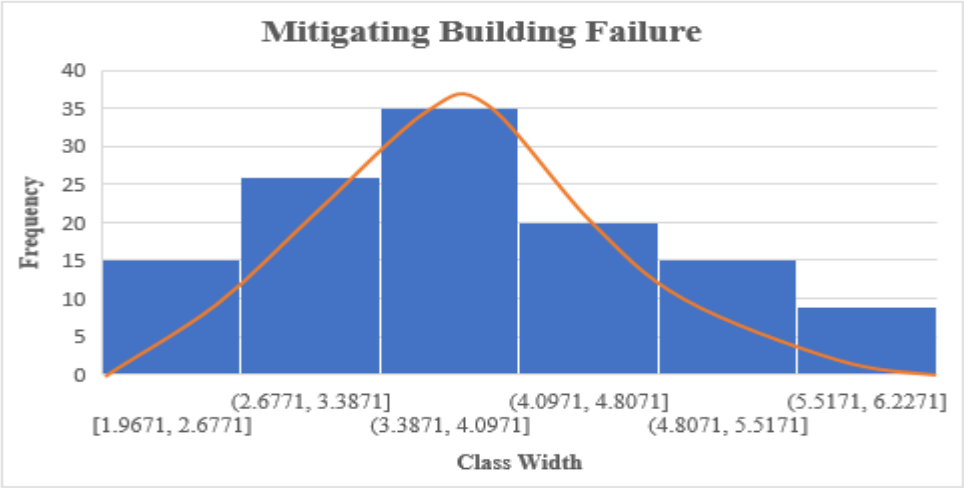

Figure 4.5: Normal Distribution for Mitigating Building Failures

Figure 4.5 gives the distribution for mitigating building failures where it indicates that the data is normally distributed with a mean of 3.83 and a standard deviation of 1.029.

4.5.2 Multicollinearity Test

Multicollinearity is exhibited if one or more independent variables can be expressed in terms of the other independent variables. That would imply that the independent variables are not truly independent of each other as assumed by fitting the OLS model. The fitted OLS model assumed that the independent variables do not exhibit multicollinearity. Mugenda and Mugenda (2012), posit that multicollinearity can occur in multiple regression models in which some of the independent variables are significantly correlated among themselves. Multicollinearity is a situation that occurs when the independent variables are highly correlated (Martz, 2013).

In their study, Mutunga &Minja *et al.,* (2014) tested for multicollinearity using the VIFs and tolerance.

Table 4.11: Multicollinearity

	Tolerance	VIF
Policy Framework	.768	1.656
Legal Framework	.694	1.710
Institutional Frameworks	.972	1.433
Contextual Framework	.843	1.225

The fitted model was tested for multicollinearity as shown in table 4.11. To confirm that there was non-multicollinearity in the model, all the independent variables were shown to have tolerances of values above 0.2 and VIFs of below 5.0, according Ringle *et al*., (2015), the maximum level for the VIF range is 5 while Hair *et al*., (2010) observed that the tolerance value for multicollinearity should be above 0.2. Additionally, Shrestha (2020) asserts that for VIF within the range of 1 and 5 indicates that there is no multicollinearity.

4.5.3 Test of Linearity

When performing multiple regressions, we assume that the relationship between the dependent variable and the independent variables is linear. If this assumption is violated, the multiple regressions will try to fit a straight line to data that do not follow a straight line. To assess linearity, the primary concern is to observe the scatterplot of the standardized residuals with the standardized predicted values. From the findings in Figure 4.6 and Figure 4.7, it shows that the relationship of standardized predicted to residuals is linear. The researcher concludes that the linearity assumption is satisfied.

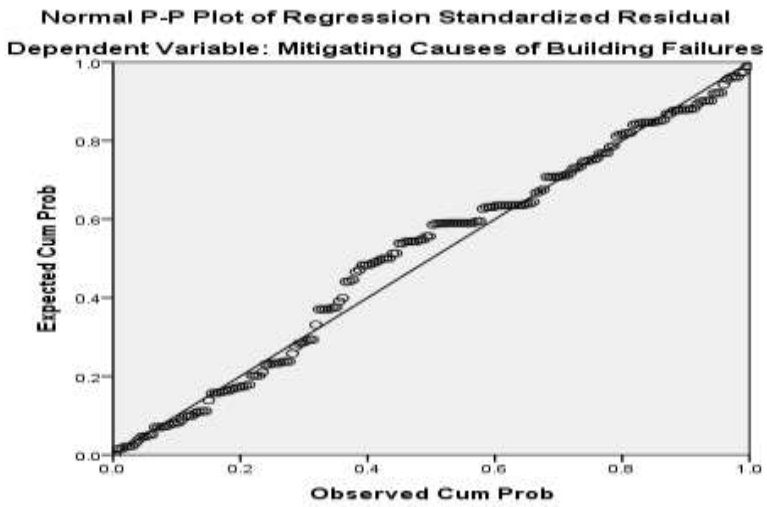

Figure 4.6: Linearity Scatterplot

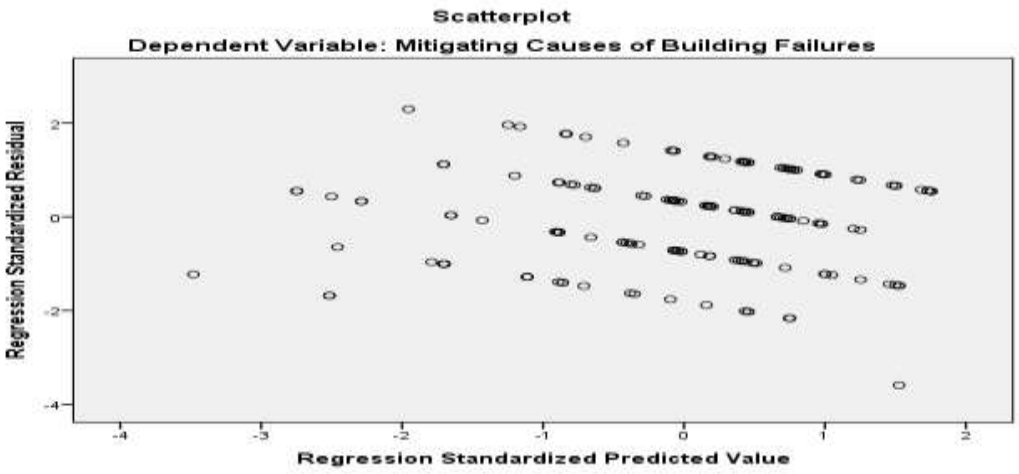

Figure 4.7: Nonlinear Scatter plot

4.5.4 Homoscedasticity Test

Knaub (2007) observed that if the level of Leven Statistics is more than 0.05 then the data is homogenous.

Table 4.12: HomoscedasticityTest Results

	Levene Statistic	df1	Sig.
Policy Framework	14.845	206	.000
Legal Framework	49.740	206	.000
Institutional Framework	38.110	206	.000
Contextual Framework	73.396	206	.000

From table 4.12 the Levene statistic for independent variables are mare than the 0.05 implying that the data is homogenous

4.6 Influence of Policy Framework on Mitigating Building Failure in Kenya

4.6.1 Awareness of the Relevant Policies

The findings in figure 4.8 indicate that most (59%) of the professionals in the building industry are aware of the relevant policies that exist while (41%) are not aware of the existing policies. This indicates that the relevant authorities that are charged with the implementation of the policies have not done enough sensitization to ensure that every professional in the industry is aware of all existing sector policies to enable implementation and enforcement. This also indicates low level of professional involvement in the policy formulation process.

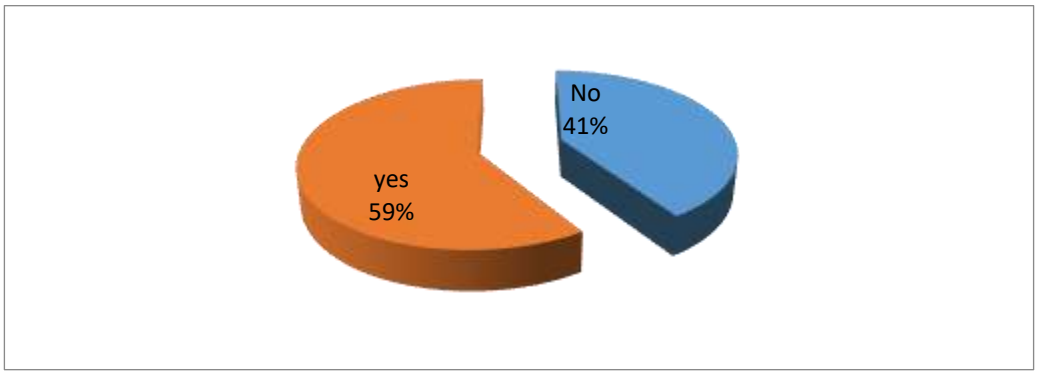

Figure 4.8: Awareness of the Relevant Policies

4.6.2 Policy Framework that is Mostly Adopted in Routine Job

From the findings in figure 4.9, indicates that majority of the respondents adopt construction industry policies in their routine work (34%) followed by the building policy (25%) then National Housing Policy (22%). This finding indicates that professionals in the building industry mostly adopt construction policy while maintenance policy is the one that is least adopted which explains why building fails due to performance failure induced by non-structural components and factors such as poor maintenance or exposure to adverse climate conditions.

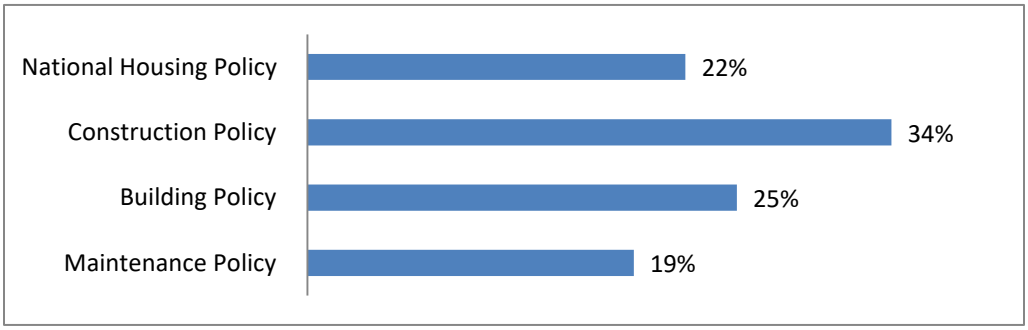

Figure 4.9: Policies that are Mostly Adopted by the Respondents

4.6.3 Accessibility of the Policies

Following the study findings in figure 4.10 as given by the total number of the frequency counts of the respondents, it indicates that majority of the respondents (39%) find it very easy to access relevant policies with respect to buildings. Respondents (36%) find it easy to access the relevant policies while 17% and 3% find it difficult and very difficult respectively to access the sector policies.

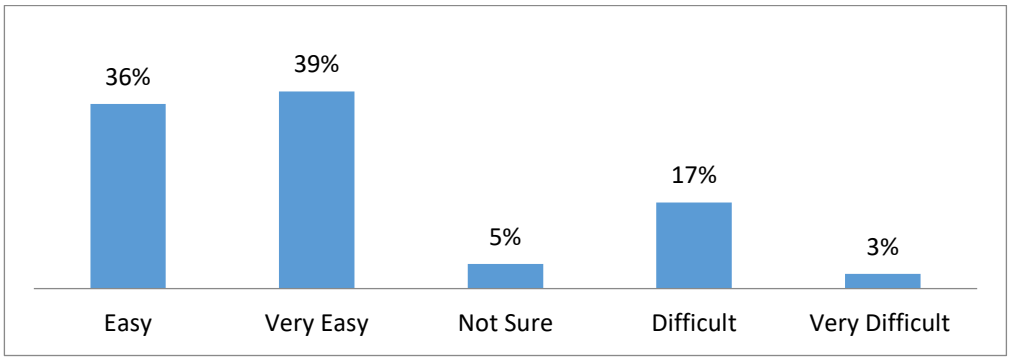

Figure 4.10: Accessibility of the Policies

4.6.4 Factor Analysis on Policy Framework

Table 4.13: Factor Analysis on Policy Framework

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
There is adequate implementation and enforcement of building sector policies	1.812	10.225	47.07
There exists a comprehensive building policy in the country	1.716	9.154	56.224
There is continuous review and audit of building sector policy implementation and success	1.614	8.428	64.652
Stakeholders in the building sector are fully aware and conversant with the existing policies governing the building sector	1.523	7.033	71.685
Stakeholders in the building sector adequately comply with the existing building policies	1.499	6.732	78.417
There are adequate policies guiding all the areas within the building sector	1.346	4.822	83.239
There is adequate harmonization of the multiple policies guiding the building sector	1.236	4.695	87.934
There is continuous reference to the laid down policies in all building processes	1.158	3.323	91.257
The existing building policies are clearly defined and communicated to stakeholders	1.146	2.853	94.11
Existing building policy is operationalized through the building regulation	1.123	2.652	96.762
Building policies are formulated through participation of all building stakeholders	1.111	2.468	96.578
Existing policies covers safety and risk management practices	1.023	2.254	98.832
Adherence to the building policy reduces building failures	.014	0.548	99.38
Building polices specify maintenance requirements	.005	0.318	99.698
Existing building policies covers building sustainability	.001	0.302	100.000

Following the findings in table 4.13, the eigenvalue or amount of variance in the original variables accounted for by each component as given by the ‘total’ is greater than one in

most of the variable except the last 3 factors; therefore, the following factors were dropped in the analysis: Adherence to the building policy reduces building failures; Building polices specify maintenance requirements and Existing building policies covers building sustainability". According Purdon, (2015), the cut off point for factor loading in confirmatory factor analysis is determined by the researcher depending on the eigenvalues obtained during the factor analysis. In this case, the last three factors in table 4.12 gave much lower values as compared to the rest hence the cut off for factor loading was set as 1.

4.6.5 Frequency Distribution on Policy Framework

Table 4.14: Frequency Distribution on Policy Framework

Statement (where 1-strongly disagree, 2-disagree, 3-neither agree nor disagree, 4 –agree and 5-strongly agree)		**5**	**4**	**3**	**2**	**1**	totals
There is adequate implementation and enforcement of building sector policies	**n**	35	24	22	73	52	**206**
	%	17	12	10	36	25	**100**
There exists a comprehensive building policy in the country	**n**	12	48	16	82	48	**206**
	%	6	23	8	39	24	**100**
There is continuous review and audit of building sector policy implementation and success	**n**	16	31	13	91	55	**206**
	%	7	15	7	45	26	**100**
Stakeholders in the building sector are fully aware and conversant with the existing policies governing the building sector	**n**	8	29	15	98	56	**206**
	%	3	14	8	48	27	**100**
Stakeholders in the building sector adequately comply with the existing building policies	**n**	7	27	11	87	74	**206**
	%	3	14	5	42	36	**100**
There are adequate policies guiding all the areas within the building sector	**n**	21	28	13	77	67	**206**
	%	10	14	6	38	32	**100**
There is adequate harmonization of the multiple policies guiding the building sector	**n**	20	36	11	85	54	**206**
	%	10	17	5	41	27	**100**
There is continuous reference to the laid down policies in all building processes	**n**	12	25	12	91	66	**206**
	%	6	12	6	44	32	**100**
The existing building policies are clearly defined and communicated to stakeholders	**n**	14	33	10	89	60	**206**
	%	7	16	5	43	29	**100**
Existing building policy is operationalized through the building regulation	**n**	25	32	13	80	56	**206**
	%	12	15	6	39	28	**100**
Building policies are formulated through participation of all building stakeholders	n	16	21	12	82	75	206
	%	8	10	6	40	36	**100**
	n	14	12	21	81	78	**206**
Existing policies covers safety and	**%**	7	6	10	39	38	**100**

Risk management practices

The findings in table 4.14 indicates that majority of the respondents 36% disagree that there is adequate implementation and enforcement of the building sector policies while 39% majority disagree that there is existence of comprehensive building policy in Kenya. There is no continuous review and audit of building sector Policy implementation and success (45%) while stakeholders in the building sector (48%) are not fully aware and conversant with the existing Policies governing the building sector. Stakeholder in the building sector do not comply with the existing building policies (42%) and there no adequate policies guiding all the areas within the building process and lack of effort to harmonize multiple policies in the building sector and lack of stakeholder participation in the formulation of all building Policies (40%).

4.6.6 Regression Analysis

The first objective of the study was to determine the influence of policy framework on mitigating building failures in Kenya. Based on linear regression model, the study sought to determine the influence of policy framework on mitigating building failures in Kenya. The following hypothesis were therefore tested:

H_0: Policy Framework has no significant influence on mitigating building failures in Kenya

Table 4.15: Model Summary for Policy Framework

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.836[a]	.845	.787	.413

a. Independent variables: (Constant), Policy Framework

The study found out that policy framework explained a significant proportion on mitigating building failures in Kenya, R^2= .845 This implies that 84.5% of the proportion

in mitigating building failures in Kenya can be explained by policy framework as indicated in table 4.15.

Table 4.16: ANOVA for Policy Framework

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.366	1	9.366	23.177	.000[b]
	Residual	4.041	204	.4041		
	Total	13.407	205			

a. Dependent Variable: Mitigating Building Failures
b. Independent variables: (Constant), Policy Framework

The findings on table 5.16 indicate that the significance value in testing the significance of the model for the relationship between policy framework and mitigating building failures was $p = 0.000$ which is less than 0.05 testing at 5% significance level using a one tail test. Therefore the null hypothesis is rejected and the research then concludes that: the Policy Framework has a significant influence on mitigating building failures in Kenya.

Table 4.17: Regression Coefficients for Policy Framework

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.647	.661		1.387	.014
	Policy Framework	.937	.109	.756	7.812	.000

a. Dependent Variable: Mitigating Building Failures

Based on the linear regression model, $Y = \alpha + \beta_1 X_1 + e$, the model therefore becomes;

$Y = 0.647 + 0.937X_1 + e$

The study findings in the table 4.17 indicate that for very one unit change in policy framework, mitigating building failures in Kenya increases by 93.7% ceteris paribus hence implying a positive influence of policy framework on mitigating building failures in Kenya. The study found that policy framework significantly predicted mitigating

building failures, β = .937, t = 7.812, p = .000. This finding implied rejection of the null hypothesis since the p value is less than<.05 set by the study. The study therefore concluded that policy framework significantly influences mitigating building failures in Kenya.

The findings are supported by Sapru (2009) who denotes that without policy, legislative efforts would be disjoined and blind to the industry. The proper way to make law is to begin from identifying sector challenges and then weaving solid policy grounds and direction for the sector after which attendant laws and regulations can be made.

According to Riemer (2009), any effective law must be anchored on strong policy that covers proper troubleshooting of the presenting challenges culminating with proposals for relevant and water tight legal mechanism. It is a foundation in which to understand any sector and address its challenges. Policy coverage for the building and construction sectors of the East African region are glaring weak.

4.7 Influence of Legal Framework on Mitigating Building Failures in Kenya

4.7.1 The legal framework that is mostly used in the building sector

The findings in figure 4.11 indicate that most (37%) of the respondents in the study use building by laws as their main legal framework followed by the respondents (29%,) who use building regulations. The study however reveals that building code is the one that is least (14%) adopted by the respondents. The study contradicts the findings of Ndithu (2013) on the building code stressing that most contractors always use the building code in the construction sites. This could be probably because the Kenya Building Code is outdated having been adopted from British Building Code of 1948. Kenya Building Code is 1968 and not responsive to dynamic changes in the building sector where construction technology has tremendously changed.

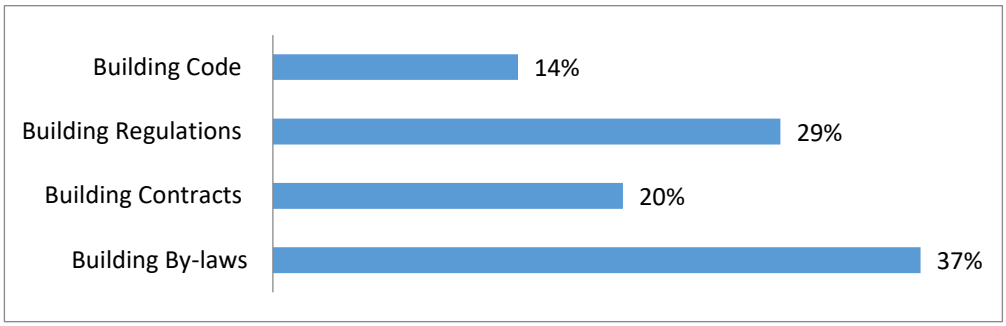

Figure 4.11: The legal framework that is mostly used in the building sector

4.7.2 The Legal Framework has Adequate Sanctions and Penalties

The study findings in figure 4.12 reveals that only (36%) of the respondents have the opinion that the legal framework has adequate sanctions and penalties for errand contractors followed by (28%) for non-compliance with the regulations. The study findings also revealed that only (19%) opined adequate sanctions and penalties for errand professional and 11% for use of substandard materials and 6% for non-maintenance of buildings.

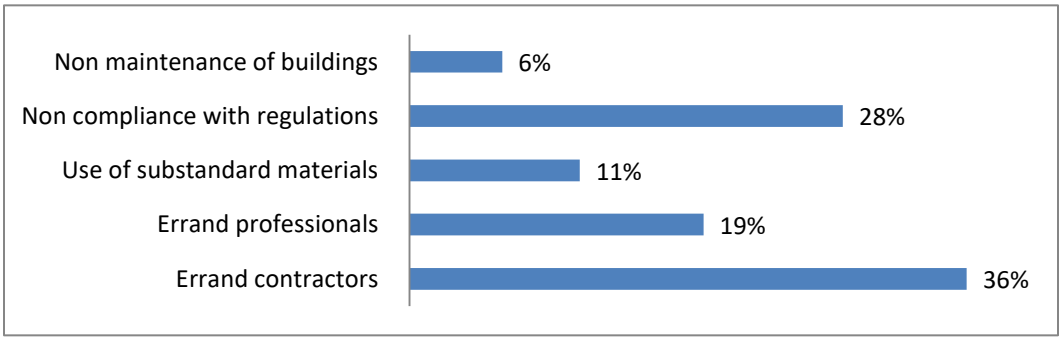

Figure 4.12: The Legal Framework has Adequate Sanctions and Penalties

4.7.3 The Status of Existing Building Laws and Regulations

The study findings in figure 4.13 indicate that majority of the respondents (53%) indicated that the existing building laws and regulations are obsolete; while (41%,) indicated that the existing building laws and regulations do not adequately mitigate building failures.

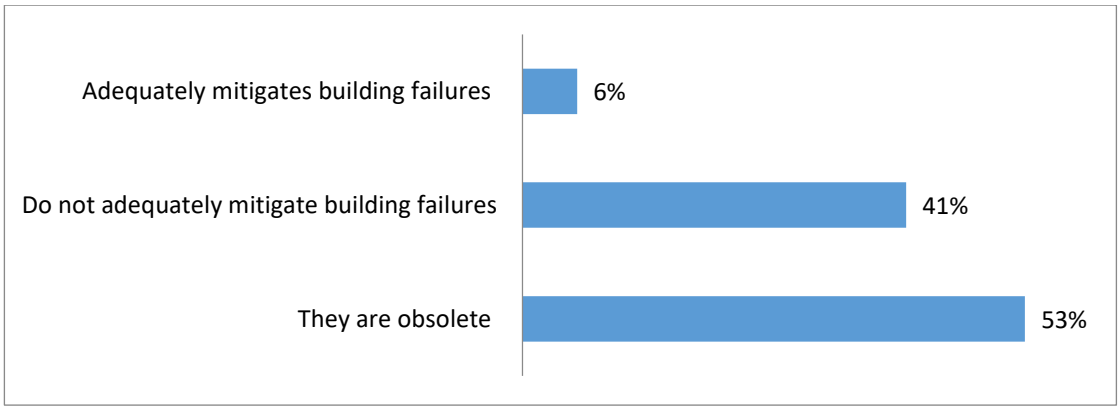

Figure 4.13: The Status of Existing Building Laws and Regulations

4.7.4 Factor Analysis on Legal Framework

Table 4.18: Factor Analysis on Legal Framework

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
Developers adequately comply with the existing building laws and codes of practice	1.916	9.235	47.581
There is a comprehensive and integrated legal framework guiding operations in the building industry	1.826	8.123	55.704
Multiplicity of laws and regulations guiding building sector impact negatively to the sector	1.745	7.146	62.850
Selective application of the laws causes building failure	1.744	6.938	69.788
Stakeholders in the building sector are fully aware and conversant with the existing sector laws and regulations	1.741	6.764	76.552
The existing legal framework adequately supports the successful implementation of building policies	1.627	6.328	82.880
There are adequate operational laws governing Kenya's building sector	1.615	5.435	88.315
The building laws and regulations are clearly defined	1.546	4.112	92.427
There are sanctions and penalties for law/regulation defaulters	1.469	3.753	96.180
Complexity and ambiguity of building laws and regulations affects the effectiveness in enforcement of building laws	1.339	1.854	98.034
The administration of the various statutes by several agencies affects the efficiency and coordination in enforcing building laws	1.256	1.230	99.264
There is adequate legal provision for decommissioning aged buildings	1.045	0.210	99.474
There are adequate operational laws governing Kenya's building sector	0.144	0.200	99.674
There are adequate legal/regulations enforcement procedures within the building industry	0.133	0.198	99.872
Existence of many pieces of regulations scattered in many statutes complicates implementation of building procedures	0.122	0.125	99.997
There is adequate legal provision of building maintenance	0.011	0.003	100.000

Following the findings in table 4.18, the Eigenvalues or amount of variance in the original variables accounted for by each component as given by the 'total' is greater than one in most of the variable except the last 4 factors; therefore, the following factors were dropped in the analysis:

There are adequate operational laws governing Kenya's building sector; There are adequate legal/regulations enforcement procedures within the building industry; Existence of many pieces of regulations scattered in many statutes complicates implementation of building procedures; There is adequate legal provision of building maintenance;

The dropped factors have similar meaning to other statements that are already mentioned in the study or they are not making any good sense to the respondents thus reducing redundancy in the data collection instrument. According to Purdon (2015), where one is doing confirmatory factor analysis, the cut off point for factor loading is determined by the researcher depending on the eigenvalues obtained during the factor analysis. In this case, the last four factors in table 4.18 gave much lower values as compared to the rest hence the cut off for factor loading was set as 1.

4.7.5 Frequency Distribution on Legal Framework

Table 4.19: Frequency Distribution on Legal Framework

Statement **(where 1-strongly disagree, 2-disagree, 3-neither agree nor disagree, 4 –agree and 5-strongly agree)**		**5**	**4**	**3**	**2**	**1**	**Totals**
Developers adequately comply with the existing building laws and codes of practice	**n**	23	27	18	78	60	**206**
	%	11	13	9	38	29	**100**
There is a comprehensive and integrated legal framework guiding operations in the building industry	**n**	33	41	14	66	52	**206**
	%	16	20	7	32	25	**100**

Multiplicity of laws and regulations guiding building sector impact negatively to the sector	**n**	60	56	18	41	31	**206**
	%	29	27	9	20	15	**100**
Selective application of the laws causes building failure	**n**	64	54	16	35	37	**206**
	%	31	26	8	17	18	**100**
Stakeholders in the building sector are fully aware and conversant with the existing sector laws and regulations	**n**	25	37	14	72	58	**206**
	%	12	18	7	35	28	**100**
The existing legal framework adequately supports the successful implementation of building policies	**n**	27	39	12	68	60	**206**
	%	13	19	6	33	29	**100**
There are adequate operational laws governing Kenya's building sector	**n**	28	44	16	58	60	**206**
	%	14	21	8	28	29	**100**
The building laws and regulations are clearly defined	**n**	33	45	10	64	54	**206**
	%	16	22	5	31	26	**100**
There are sanctions and penalties for law/regulation defaulters	**n**	56	52	12	45	41	**206**
	%	27	25	6	22	20	**100**
Complexity and ambiguity of building laws and regulations affects the effectiveness in enforcement of building laws	**n**	44	78	16	31	37	**206**
	%	21	38	8	15	18	**100**
The administration of the various statutes by several agencies do not affect the efficiency and coordination in enforcing building laws	**n**	52	74	18	35	27	**206**
	%	25	36	9	17	13	**100**
There is adequate legal provision for decommissioning aged buildings	**n**	58	63	14	43	28	**206**
	%	27	31	7	21	14	**100**

The study findings in table 4.19 indicate that majority (38%,) of the respondents disagree that developers adequately comply with the existing building laws and codes of practice followed by those who strongly disagreed at 29% that developers adequately comply with the existing building laws and codes of practice. Majority of the respondents (32%)also disagreed that there is a comprehensive and integrated legal framework guiding operations in the building industry followed by those respondents who totally disagreed at 25%. The study findings further revealed that majority (29%) of the respondents totally agreed that multiplicity of laws and regulations guiding building sector impact negatively to the sector

followed by those respondents who agreed at 27%. Further, the respondents totally agreed that selective application of the laws causes building failure (31%). The findings were in agreement with the findings of Mativo and Akech (2015) stressing that it is only when there is a presence of operationalization of an effective legal framework and proper enforcement of laws is when the risk of building failures will reduce.

4.7.6 Regression Analysis on Legal Framework

The Second Objective of the study was to examine the influence of legal framework on mitigating building failures in Kenya. Based on linear regression model, the study sought to examine the influence of legal framework on mitigating building failures in Kenya. the following hypothesis was therefore tested:

H_0: Legal Framework has no significant influence on mitigating building failures in Kenya

Table 4.20: Model Summary for Legal Framework

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.766[a]	.743	.784	1.579

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a. Independent variables: (Constant), legal framework

The study found out that legal framework explained a significant proportion of variance in mitigating building failures in Kenya, R^2= .743. This implies that 74.3% of the proportion in mitigating building failures in Kenya can be explained by Legal framework as indicated in table 4.20

Table 4.21: ANOVA for Legal Framework

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.326	1	8.326	26.643	.000[b]
	Residual	3.125	204	.313		
	Total	**11.451**	**205**			

a. Dependent Variable: Mitigating Building Failures
b. Independent variables: (Constant), legal Framework

The findings in table 4.21 indicate that the model is significant in testing hypothesis of the study since the p value (0.000) is less than 0.05 testing at 5% significance level using a one tail test. Therefore, the researcher rejects the null hypothesis and concludes that the legal framework has a significant influence on mitigating building failures in Kenya.

Table 4.22: Regression Coefficients for Legal Framework

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.675	.502		1.156	.012
	Legal Framework	.742	.113	.644	6.541	.000

a. Dependent Variable: Mitigating Building Failures

Based on the linear regression model, $Y = \alpha + \beta_1 X_1 + e$, the model therefore becomes;

$Y = 0.675 + 0.742X_1 + e$

The findings in table 4.22 imply that for every one-unit change in legal framework, mitigation of building failures in Kenya increases by 74.2% ceteris paribus hence implying a positive influence of legal framework on mitigating building failures in Kenya. The study found that legal framework significantly predicted mitigating building failures, $\beta = .742$, t (1.156) = 6.541, $p = .000$. This finding implied rejection of the null hypothesis since the p value was less than<.05 set by the study. The study therefore concluded that the legal framework significantly influences mitigating building failures in Kenya.

The findings are consistent with those of Kioko (2014) who studied the causes of building failures in Africa and notes that collapse of buildings is mainly due to lack of legal framework particularly African Code of Practice and that most codes used are foreign codes either from Britain or India applied in the use of local construction materials. The study points out that building failures are as a result of the usage of substandard in building works, poor workmanship, incompetent contractors, non-compliance with specification and standards. The Government Queensland (2011) provides details of mandatory inspection of all buildings in order to enable certification for new occupation or continued occupation.

The guidelines are to ensure that buildings comply with state requirements for safety and health and inspections are anchored in the building code and have a policy and legal backing for prosecution in case of default. Oloyede (2010), studied collapse of buildings in Nigeria notes that non-compliance with the law and slow or selective application of the law and weak capacities in oversight agencies are major causes of collapse of buildings. Wardhana (2003), notes that breakdown between the law and enforcement is a breeding ground for building malpractices which eventually lead to building failures.

4.8 Influence of Institutional Framework on Mitigation of Building Failures in Kenya

4.8.1 Institutions Relevant in Mitigating Building Failures

The study findings in figure 4.14 indicate that NCA is the institution that majorly mitigate building failures (61%) followed by the County Government (20%) while NBI was the least (6%). The study results indicate that the National Building Inspectorate (NBI) contributes very little to the mitigation of building failures while the National Construction Authority contributes the most in mitigation of building failures. The County Governments do not make reasonable contributions towards the expectation of the general public based on the role they play on approvals and necessary periodical inspection of constructions at the county levels.

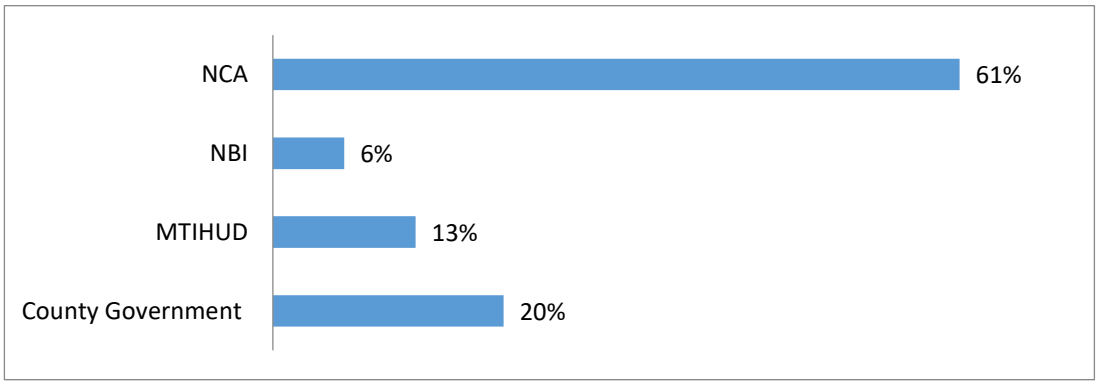

Figure 4.14: Institutions those are relevant in Mitigating Building Failures

4.8.2 Factors Hindering Institutions from Mitigating Building Failures

The study finding in figure 4.15 indicate that lack of personnel is the most frequent factor that hinder mitigation of building failures (43%) followed by lack of finance (34%) as other respondents indicated that the staff they have is not enough to cover the existing geographical locations for inspections and supervisions during the regular working hours hence most constructions go uninspected while 23% indicated lack of equipment for testing of materials and structural integrity tests.

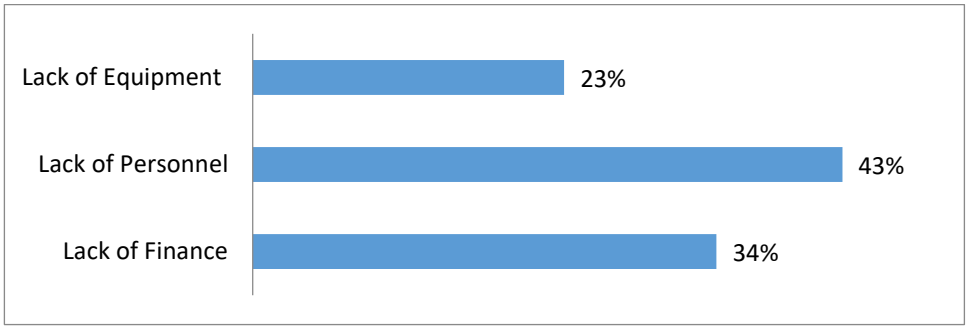

Figure 4.15: Factors Hindering Institutions from Mitigating Building Failures

4.8.3 How Institutions Mitigate Building Failures

The study findings in figure 4.16 indicate that the institutions studied mitigate building failures by different response rates as given by the counts of the frequency of the response

where the highest method through which institutions mitigate building failures is through 'regular inspection' (65%) followed by the response on the 'enforcement of the law' (25%) and the least being enforcement of the policies at 10%.

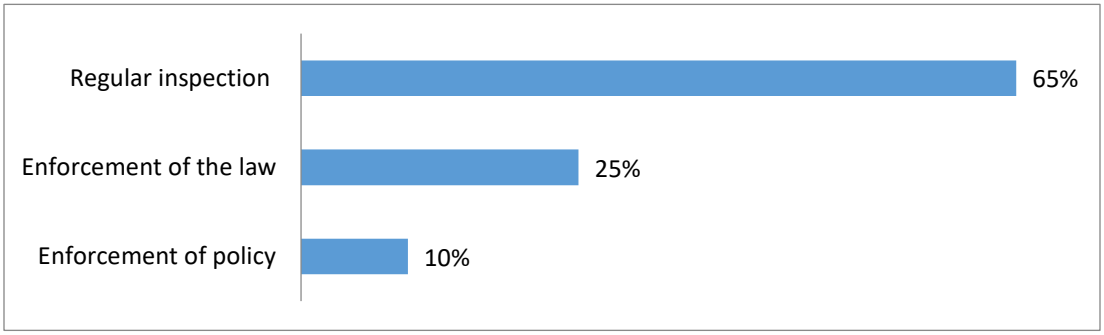

Figure 4.16: How Institutions Mitigate Building Failures

4.8.4 Major Causes of Building Failures

The study findings in figure 4.17 indicate that 'conflict between institutions' is the main cause of building failure (49%) based on the counts of the frequency responses followed by 'conflict between national and county governments' (29%) while the least response was 'many institutions managing the building sector' (22%).

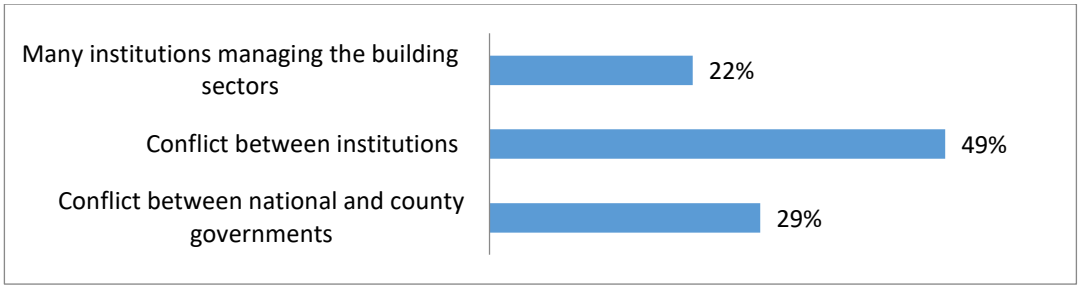

Figure 4.17: Major Causes of Building Failure

4.8.5 Factor Analysis on Institutional Framework

Table 4.23: Factor Analysis on Institutional Framework

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
There are adequate institutions managing building sector	6.710	33.845	33.845
Multiplicity of institutions with different mandates and jurisdiction brings conflicts in the functionality of building industry	1.863	9.423	43.268
Regulatory and supervisory agencies have adequate equipment to put in place various associated quality assurance procedures	1.823	8.733	52.001
There are multiple institutions and agencies with legal mandates in the governance of the building sector	1.741	8.153	60.154
There is high coordination and integration of functions among the state agencies within the building sector	1.716	7.954	68.108
There is complexity in the institutional arrangement for overseeing the building sector	1.614	7.369	75.477
There is co-operation and coordination among all regulatory and supervisory agencies	1.612	6.542	82.019
There are unaccredited checkers/inspectors within the building sector	1.521	6.672	88.691
The agencies overseeing the building sector are adequately staffed with qualified personnel	1.432	4.323	93.014
Inadequate financial allocation to regulatory and supervisory agencies affects their ability to realize their mandates	1.329	3.132	96.146
Inadequate capacity of regulatory and supervisory agencies limits inspection of buildings as procedure required	1.256	2.422	98.568
The roles of the public and private sectors in the building industry have been clearly defined	.005	0.249	99.811
The existing institutional framework mitigates building failure in Kenya	.001	0.189	100.000

Following the findings in table 4.23, the eigenvalue or amount of variance in the original variables accounted for by each component as given by the 'total' is greater than one in most of the variable except the last two (2) factors; the roles of the public and private

sectors in the building industry have been clearly defined and the existing institutional framework mitigates building failures in Kenya.

The dropped factor has a similar meaning to other statements that are already mentioned in the study or they are not making any good sense to the respondents thus reducing redundancy in the data collection instrument. According to Pardon (2015) where one is doing confirmatory factor analysis, the cut off point for factor loading is determined by the researcher depending on the Eigen values obtained during the factor analysis. In this case, the last two factors in table 4.22 gave much lower values as compared to the rest hence the cut off for factor loading was set as 1.

4.8.6 Frequency Distribution on Institutional Framework

Table 4.24: Frequency Distribution on Institutional Framework

Statement		**5**	**4**	**3**	**2**	**1**	**Totals**
(where 1-strongly disagree, 2-disagree, 3-neither agree nor disagree, 4 –agree and 5-strongly agree)							
There are adequate institutions managing building sector	**n**	26	32	13	80	55	**206**
	%	13	15	6	39	29	**100**
Multiplicity of institutions with different mandates and jurisdiction brings conflicts in the functionality of building industry	**n**	74	82	12	21	17	**206**
	%	35	40	6	10	9	**100**
Regulatory and supervisory agencies have adequate equipment to put in place various associated quality assurance procedures	**n**	13	25	12	91	65	**206**
	%	7	12	6	44	31	**100**
There are multiple institutions and agencies with legal mandates in the governance of the building sector	**n**	13	33	10	89	61	**206**
	%	6	16	5	43	30	**100**
There is high coordination and integration of functions among	**n**	8	27	11	87	73	**206**
	%	4	14	5	42	35	**100**

the state agencies within the building sector							
There is complexity in the institutional arrangement for overseeing the building sector	**n**	22	28	13	77	66	**206**
	%	11	14	6	38	33	**100**
There is co-operation and coordination among all regulatory and supervisory agencies	**n**	21	36	11	85	55	**206**
	%	11	17	5	41	28	**100**
There are unaccredited checkers/inspectors within the building sector	**n**	75	87	11	27	8	**206**
	%	37	42	5	14	4	**100**
The agencies overseeing the building sector are adequately staffed with qualified personnel	**n**	22	28	13	77	66	**206**
	%	11	14	6	38	31	**100**
Inadequate financial allocation to regulatory and supervisory agencies affects their ability to realize their mandates	**n**	54	91	13	31	17	**206**
	%	25	45	7	15	8	**100**
Inadequate capacity of regulatory and supervisory agencies limits inspection of buildings as procedure require	**n**	58	95	16	26	11	**206**
	%	28	46	7	13	6	**100**

The study findings in table 4.24 indicate that there are not enough institutions managing the building sector as indicated by the highest response of 39% for the population of the respondents who disagreed followed by the 29% of the population who totally disagreed on the same issue. The study also indicates that the existence of multiplicity of institutions with different mandates and jurisdiction do not bring conflicts in the functionality of building industry supported by 40% of the respondents who agreed followed by the 35% of the respondents who totally agreed on the same.

The study findings also agreed that inadequate financial allocation to regulatory and supervisory agencies affects their ability to realize their mandates as indicated by 45% of the respondents who agreed followed by 25% of the respondents who totally agreed. The study further indicated that inadequate capacity of regulatory and supervisory agencies limits inspection of buildings as procedure require as given by 28% of the respondents who totally agreed followed by 46% of the respondents who agreed. The study also

indicates lack of equipment to undertake quality assurance and lack of coordination and integration of functions among the State agencies within the building sector. There is also lack of qualified personnel as indicated by 38%.

4.8.7 Regression Analysis on Institutional Framework

The third objective was to establish the influence of institutional framework on mitigation of building failures in Kenya. Based on linear regression model, the study sought to establish the influence of institutional framework on mitigating building failures in Kenya. The following hypothesis was therefore tested:

H_0: Institutional Framework has no significant influence on mitigating building failures in Kenya

Table 4.25: Model Summary for Institutional Framework

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.558[a]	.311	.308	.41717

a. Predictors: (Constant), Institutional Framework

The study findings in table 4.25 indicates that institutional framework explained a significant proportion of variance in mitigating building failures in Kenya, R^2= .311 This implies that 31.1% of the proportion in mitigation of building failures in Kenya can be explained by institutional framework as indicated in table 4.23.

Table 4.26: ANOVA for Institutional Framework

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	9.245	1	9.245	24.265	.000[b]
	Residual	4.568	204	.381		
	Total	13.813	205			

a. Dependent Variable: Mitigating Building Failures

b. Independent variables: (Constant), Institutional Framework

The findings in table 4.26 gives the significance of the ANOVA model where the p-values obtained was less than 0.05 testing at 5% significance level using a one tail test indicating that the model is significant and can be relied upon. The F-value obtained was 24.265 which is greater than 0.05 testing at 5% significance level using a one tail test indicating that the null hypothesis is rejected. The study then concludes that the institutional framework has a significant influence on mitigating building failures in Kenya.

Table 4.27: Regression Coefficients for Institutional Framework

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.768	.448		1.136	.016
	Institutional Framework	.968	.109	.639	7.556	.000

a. Dependent Variable: Mitigating Building Failures

Based on the linear regression model, $Y = \alpha + \beta_1 X_1 + e$, the model therefore becomes; $Y = 0.768 + 0.968X_1 + e$.

The study findings in table 4.27 indicate that for very one-unit change in institutional framework, mitigating building failures in Kenya increases by 96.8% ceteris paribus hence implying a positive influence of institutional framework on mitigating building failures in Kenya. The study found that institutional framework significantly predicted

mitigating building failures, β = .968, t(1.136) = 7.556, p = .000. This finding implied rejection of the null hypothesis since the p value was less than <.05 set by the study. The study therefore concluded that the institutional framework significantly influences mitigating building failures in Kenya.

The findings are consistent with those of Wardhama (2003) who studied the importance of strong institutional framework in preventing building failures while looking at causes of building collapses in Asia and points out lack of skills in inspecting ongoing construction works as well as coordination among involved arms of government. This breakdown between law, enforcement and standards forms a large loophole which developers use to circumvent requirement for structural integrity in construction.

4.9 Influence of Contextual Framework on Mitigating Building Failures in Kenya

4.9.1 Situations where Bribery occurs leading to Building Failures

The study findings in figure 4.18 indicate that inspection of buildings during construction are the main (59%) situations where bribery occurs followed by the design approval stage (30%) while (11%) bribery occurs during certification.

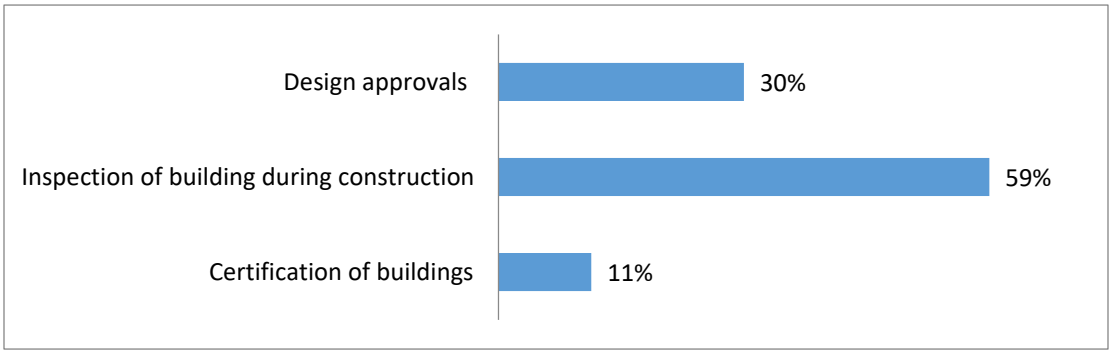

Figure 4.18: Situations where Bribery Occurs leading to Building Failures

4.9.2 How Building Professionals Contributes to Building Failures

The study findings in figure 4.19 indicate that building professionals majorly (55%) contributes to building failures through bribery followed by the use of unprofessional practice at 33%. While 7% and 4% do not comply with building regulations/standards and providing compromise in designs respectively. Compromise in design leads to structural failure and eventually total collapse.

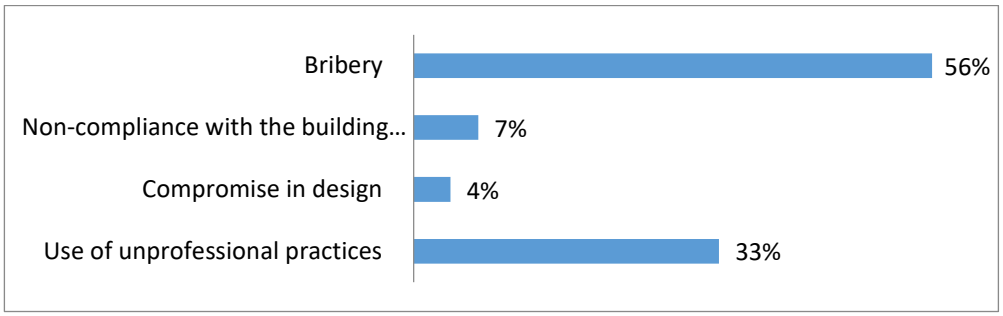

Figure 4.19: How Building Professionals Contributes to Building Failures

4.9.3 Factor Analysis on Contextual Framework

Table 4.28: Factor Analysis on Contextual Framework

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
The existing disciplinary mechanisms for malpractices within the building sector are highly effective	8.741	35.280	35.280
The cases of compromising officials' being involved in the inspection of buildings during or after construction are high	1.848	8.125	43.405
The level of non-adherence to quality assurance in the building sector is high	1.801	8.106	51.511
Technical personnel usually run multiple construction projects at any given time	1.635	7.005	58.516
Most contractors fully adhere to approved building designs and standards	1.541	6.634	65.15
There has been an increased number of bribery related cases in the building sector	1.423	6.421	71.571
There are cases of involvement of unqualified personnel not registered by professional bodies in building designs	1.326	6.258	77.829
All contractors are professionally qualified to handle construction projects	1.259	6.114	83.943
There is required workmanship throughout the construction processes	1.168	5.908	89.851
Agencies managing the building sector are actively instilling ethical culture in the building sector	1.125	5.797	95.648
Technical personnel attached to construction works fully devote themselves in particular constructions site	1.114	2.698	98.346
There is adequate professional inspection of materials during construction process	1.106	1.254	99.600
The existing disciplinary mechanisms for malpractices within the building sector are highly effective	0.500	0.234	99.834
Contractors comply with the set building sector specifications and standards	0.434	0.166	100.00

Following the findings in table table 4.28, the Eigenvalues or amount of variance in the original variables accounted for by each component as given by the 'total' is greater than one in most of the variable except the last two (2) factors; therefore, these factors were dropped in the analysis: The existing disciplinary mechanisms for malpractices within the building sector are highly effective and Contractors comply with the set building sector specifications and standards.

According to Purdon (2015), where one is doing confirmatory factor analysis, the cut off point for factor loading is determined by the researcher depending on the eigenvalues obtained during the factor analysis. In this case, the last two factors in table 4.27 gave much lower values as compared to the rest hence the cut off for factor loading was set as 1. The dropped factor has a similar meaning to other statements that are already mentioned in the Likert scale or they are not making any good sense to the respondents thus reducing redundancy in the data collection instrument.

Table 4.29: Frequency Distribution on Contextual Framework

Statement (where 1-strongly disagree, 2-disagree, 3-neither agree nor disagree, 4 –agree and 5-strongly agree)		**5**	**4**	**3**	**2**	**1**	totals
The cases of compromising officials' being involved in the inspection of buildings during or after construction are high	**N**	45	79	16	30	36	**206**
	%	22	39	8	14	17	**100**
The level of non-adherence to quality assurance in the building sector is high	**n**	57	53	12	44	40	**206**
	%	28	26	6	21	19	**100**
Technical personnel usually run multiple construction projects at any given time	**n**	65	55	16	34	36	**206**
	%	32	27	8	16	17	**100**
Most contractors fully adhere to approved building designs and standards	**n**	31	47	16	55	57	**206**
	%	17	24	8	25	26	**100**
There has been an increased number of bribery related cases in the building sector	**n**	61	57	18	40	30	**206**
	%	30	28	9	21	14	**100**
There are cases of involvement of unqualified personnel not registered by professional bodies in building designs and supervision.	**n**	53	75	18	34	26	**206**
	%	26	37	9	16	12	**100**
All contractors are professionally qualified to handle construction projects	**n**	32	49	16	53	55	**206**
	%	19	26	8	23	24	**100**
There is required workmanship throughout the construction processes	**n**	34	46	10	63	53	**206**
	%	17	23	5	30	25	**100**
Agencies managing the building sector are actively instilling ethical culture in the building sector	**n**	29	45	16	57	59	**206**
	%	15	22	8	27	28	**100**
Technical personnel attached to construction works fully devote themselves in particular constructions site	**n**	26	38	14	71	57	**206**
	%	13	19	7	34	27	**100**
There is adequate professional inspection of materials during construction process	**n**	30	46	16	56	58	**206**
	%	16	23	8	26	27	**100**

The study findings in table 4.29 indicate that majority of the respondents agreed that there are cases of compromising officials' being involved in the inspection of buildings during or after construction are high (39%) followed by those who strongly agreed at 22% .Majority of the respondents totally disagreed that technical personnel usually run multiple construction projects at any given time (32%) followed by those who agreed at 27%. The level of non-adherence to quality assurance is high as indicated by (28%) while cases of bribery have been increasing. Most contractors are not technically qualified to undertake construction works while there were cases of use of unqualified personnel not registered by professional bodies involved in design and supervision of building construction. Most of the respondents totally agreed (26%) that most contractors do not fully adhere to approved building designs and standards followed by those who agree at 25%. The professionals attached to projects do not devote full time to the project and there is no professional inspection of materials during construction as indicated by (27%). There is disagreement that agencies managing the sector instill ethical values in the sector. The study findings are inconsistent with Ahzahar, Karim, Hassan and Eman (2011) who did a study on contribution factors to building failures and defects in construction industry and found that that corruption is the key factor leading to poor works at the construction site.

4.9.4 Regression Analysis on Contextual Framework

The fourth objective was to establish the influence of contextual framework on mitigation of building failures in Kenya. Based on linear regression model, the study sought to establish the influence of contextual framework on mitigation of building failures in Kenya. The following hypothesis was therefore tested:

H_0: Contextual Framework has no significant influence on mitigating building failures in Kenya

Table 4.30: Model Summary for Contextual Framework

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.796[a]	.715	.774	1.487

a. Independent variables: (Constant), contextual framework

The study found out that contextual framework explained a significant proportion of variance in mitigating building failures in Kenya, R^2= .715. This implies that 71.5% of the proportion in mitigating building failures in Kenya can be explained by contextual factor's covered by the study as indicated in table 4.30

Table 4.31: ANOVA for Contextual Framework

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.865	1	7.865	34.286	.000[b]
	Residual	2.769	204	.256		
	Total	10.634	205			

a. Dependent Variable: Mitigating Building Failures
b. Independent variables: (Constant), Contextual Framework

The study findings in table 4.31 indicate that the ANOVA model is significance in testing for hypothesis since its p-value 0.000 is less than 0.05 testing at 5% level of significance using a one tail test. The F-value is 34.286 which is greater than 0.05 testing at 5% significance level indicating that the null hypothesis is rejected and the researcher therefore concludes that the contextual framework has a significant influence on mitigating building failures in Kenya.

Table 4.32: Regression Coefficients for Contextual Framework

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.852	.990		1.358	.113
	Contextual Framework	.619	.198	.452	7.746	.000

a. Dependent Variable: Mitigating Building Failures

Based on the linear regression model, $Y = \alpha + \beta_1 X_1 + e$, the model therefore becomes; $Y = 0.852 + 0.619X_1 + e$

The findings obtained in table 4.32 indicate that for every one-unit change in contextual framework, mitigation of building failures in Kenya increases by 61.9% ceteris paribus hence implying a positive influence of contextual framework on mitigating building failures in Kenya. The study found that contextual framework significantly predicted mitigating building failures, $\beta = .619$, $t(1.358) = 7.746$, $p = .000$. This finding implied rejection of the null hypothesis since the p value was less than<.05 set by the study. The study therefore concluded that the contextual framework significantly influences mitigation of building failures in Kenya.

These findings are supported by chartered institutes of Building Surveyors (2010) which lays a lot of emphasis on corruption as a major cause of building failures in that sound technical and professional practices are sacrificed for personal gain. The institutes cite compromise of approvals, inspection and supervision as a major factor in causing building failures. Buildings which are approved irregularly and are not inspected in accordance with the laid down regulations are highly likely to collapse. Kioko (2014) recommends use of local building codes, employment of qualified professional and contractors, increased supervision and inspection and improved governance in construction industry to eliminate corruption.

4.10 Analysis of all Variables

4.10.1 Correlation Analysis

Table 4.33: Correlation Analysis

Variables		Mitigating building Failure	Policy Framework	Legal Framework	Institutional Framework	Contextual Framework
Mitigating Building Failure	Pearson Correlation	1				
	Sig. (2-tailed)					
Policy Framework	Pearson Correlation	0.805	1			
	Sig. (2tailed)	0.000				
Legal Framework	Pearson Correlation	0.769	0.627	1		
	Sig. (2tailed)	0.003	0.001			
Institutional Framework	Pearson Correlation	0.889	0.528	0.531	1	
	Sig. (2tailed)	0.015	0.011	0.000		
Contextual Framework	Pearson Correlation	0.701	0.148	0.325	0.489	1
	Sig. (2tailed)	0.001	0.170	0.005	0.014	

Testing at 5% significant level, two tail tests; the correlation analysis was significant since all the p-values (Sig.) was less than 0.025 ($p<0.025$). The findings further reveal that all the independent variables in the study had strong correlation with the dependent variable since their Pearson values were above 0.7 with institutional framework being the strongest variable followed by policy framework then legal framework while contextual framework was the least as indicated in table 4.33.

4.10.2 Regression Analysis for all variables

Table 4.34: Model Summary for All the Variables

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.788[a]	.752	.769	1.743

Independent variables: (Constant), policy framework, legal framework, institutional framework and contextual framework

The study found out that the independent variable in the study explained a significant proportion of variance in mitigation of building failures in Kenya, R^2= .752 which implies that 75.2% of the proportion in mitigating building failures in Kenya can be explained by the independent variables while other variables not covered by this study contributes to 24.8% of the variance as indicated in table 4.34.

Table 4.35: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.654	1	8.654	69.175	.000[b]
	Residual	4.978	204	.365		
	Total	13.632	205			

a. Dependent Variable: Mitigating Building Failures

b. Independent variables: (Constant), policy framework, legal framework, institutional framework, and contextual framework

The findings in table 4.35 indicate that the significance value in testing the reliability of the model for the relationship between independent variables and mitigating building failures was $F(1, 13) = 69.175$, $p = 0.00$; therefore, the model is statistically significant in predicting the relationship between the study variables.

Table 4.36: Regression Coefficients for all the Variable

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	.852	.990	.236	1.256	.000
Policy Framework	.302	.198	.452	1.443	.000
Legal Framework	.289	.479	.475	1.387	.001
Institutional Framework	.348	.569	.987	1.546	.000
Contextual Framework	.167	.236	.654	1.234	.002

a. Dependent Variable: Mitigating Building Failures

As shown in table 4.35 and based on the linear regression model,

$Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + e$, the model therefore becomes; $Y = 0.852 + 0.302\ X_1 + 0.289X_2 + 0.348X_3 + 0.167X_4 + e$

Where Y = dependent variable (mitigation building failure)

α = constant

$\beta_1, \beta_2, \beta_3$ and β_4 are coefficients of independent variables

X_1, X_2, X_3 and X_4= are independent variables (policy framework, legal framework, institutional framework and contextual framework respectively). Testing at 5% significant level, the regression analysis is significant since all the p-values (Sig. $p<0.025$) testing at 2 tail tests. The findings indicate that holding legal framework, institutional framework and contextual framework constant, every one unit increase in policy framework increase mitigation of building failure by 30.2%. Holding policy framework, institutional framework and contextual framework constant, every one unit increase in legal framework increases mitigation of building failures by 28.9%. Holding policy framework, legal

framework and contextual framework constant, every one unit increase in institutional framework increases mitigation of building failure by 34.8% while holding policy framework, institutional framework and legal framework constant, every one unit increase in contextual framework increases mitigation of building failures by 16.7%. From multiple regression analysis, $R^2 = 0.752$ meaning that 75.2% of building failures can be mitigated through Governance Framework and that the high degree means the regression model fits the data very well.

Table 4.37: Summary Results of Hypothesis Testing

No.	Null Hypothesis	P-Value	Decision
1.	Policy Framework has no significant influence on mitigating building failures in Kenya	P value< 0.05	Reject the null hypothesis. Therefore, Policy Framework has a significant influence on mitigating building failures in Kenya
2.	Legal Framework has no significant influence on mitigating building failures in Kenya	P value< 0.05	Reject the null hypothesis. Therefore, Legal Framework has a significant influence on mitigating building failures in Kenya
3.	Institutional framework has no significant influence on mitigating building failures in Kenya	P value< 0.05	Reject the null hypothesis. Therefore, Institutional Framework has a significant influence on mitigating building failures in Kenya
4.	Contextual framework has no significant influence on mitigating building failures in Kenya	P value< 0.05	Reject the null hypothesis. Therefore, Contextual Framework has a significant influence on mitigating building failures in Kenya

Table 4.38: Hierarchy Model of Variables

Rank	Variable	Coefficient Value
1.	Institutional Framework	0.348
2.	Policy Framework	0.302
3.	Legal Framework	0.289
4.	Contextual	0.167

Table 4.38 indicates that the institutional framework has high statistical significance in mitigating building failure followed by policy framework, legal framework and contextual framework respectively.

In order to address the issue of building failure, there is need to have strong institutions well capacitated to undertake the management and leadership of the sector, equally the sector policies, legal and contextual issue are equally statistically significant in mitigating building failure in Kenya.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENATIONS

5.1 Introduction

This chapter presents summary of the findings, conclusions and recommendations of results of the study that sought to establish influence of governance frameworks on mitigating building failures in Kenya. This is in line with the objectives of the study and the study suggests further areas of research.

5.2 Summary

The purpose of this study was to establish the influence of governance frameworks on mitigating building failures in Kenya from the analysis and review of data through a questionnaire. The study was guided by the main objective which was to establish the influence of Governance Framework on mitigating building failures in Kenya and four other specific objectives which includes; to determine the influence of policy framework on mitigating building failures in Kenya; to examine the influence of legal framework on mitigating building failures in Kenya; to establish the influence of institutional framework on mitigating building failures in Kenya and to establish the influence of the contextual framework on mitigating building failures in Kenya.

Data was collected through the use of a questionnaire which was administered to sampled respondents. Both descriptive and inferential methods were employed in analyzing the data collected. Descriptive methods included means, standard deviations, frequencies and percentages that showed the trends in the data whereas inferential methods included correlation analysis and regression analysis. The findings were then presented in tables, figures, bar charts, and graphs where appropriate.

The study used both descriptive and correlational research designs which were quantitative and qualitative in nature. The target population was from the National

Government and County Governments, the sample size was determined by the proportion of policy makers, law enforcers, quality assurance officers in the relevant target institutions. The study also used stratified sampling and questionnaires during the sampling procedure.

In testing the relationship between the study variables which included policy framework, legal framework, institutional framework, and contextual framework, the results show that all these governance frameworks had a significant influence on mitigating building failures. The regression analysis results also indicated that all governance framework had a strong positive and significant influence on mitigating building failures in Kenya.

5.2.1 Demographic Information

Demographic information of the respondents is presented in terms of age, sex, level of education, employer, department, and profession. A total of 275 questionnaires were issued out for the survey, 206 were completely filled making a large turnout. Out of the 206 respondents, majority were male while the rest were female. Most of the respondents had attained a diploma level in education followed by bachelors, masters, and then PhD. Majority of the respondents had served in their current employment for a period between three to eight years, followed by those who had served for a period of eight to twelve years, the third group had served for a period of one to three years, the fourth group had served for a period of twelve to fifteen years, new employees had served for less than a year while the oldest employees had served for more than fifteen years. Majority of the respondents were aged 31-40 years, followed by those below 30 years, then those below 41-50 years and those above 60 years respectively.

5.2.2 Influence of Policy Framework on Mitigating Building Failures in Kenya

The study sought to find out the influence of policy framework on mitigating building failure in Kenya where it established that not all of the building professionals are aware of existing building policies in the country as given by 59% of the response on awareness

of the policies. The study also established that not all stakeholders have accessibility of the relevant building policies.

The study also found out that the existing policy do not cover adequately safety and risk management practices and that not all stakeholders in the building sector comply with the existing building policies and are not fully aware and conversant with the existing policies governing the building sector; this implies that the authorities charged with the implementation of the building policies in the country do not sensitize the professionals in building industry to be fully aware of all the relevant policies in order to also enhance compliance to the building policies The study established that most of the respondents in the study mostly adopts construction policy while building maintenance policy was the least adopted by the industry practitioners implying low level of maintenance of the existing housing stock. This calls for sensitization of all the existing policies to stakeholder and involvement in the policy formulation and implementation. The study also established the existence of many pieces of policies touching on building by different sub-sectors which are not harmonized that making the implementation a challenge. The study also established that the existing building policies do not cover extensively on the safety requirements of the buildings and not all building stakeholders are involved during the building policy formulation. The National Construction Authority and National Building Inspectorate institutions mandated to manage building industry are not anchored in policy.

The study sought to determine the influence of the policy framework on mitigating building failures in Kenya, the following hypotheses were formulated:

H_0: Policy Framework has no significant influence on mitigating building failures in Kenya

The hypothesis was tested using ANOVA model on the relationship between policy framework and mitigation of building failures where the model was found to be significant with the p-value 0.000 <0.05 testing at 5% significant level using a one tail test implying

that the null hypothesis is rejected hence concluding that the policy framework has a significant influence on mitigating building failures in Kenya.

5.2.3 Influence of Legal Framework on Mitigating Building Failures in Kenya

The study sought to examine the influence of the legal framework on mitigating building failures in Kenya. The study established that building by-laws are the most used legal instrument, followed by building regulations, building contracts then building code as the least used the legal framework in the building sector. The study further determined that the legal framework had inadequate sanctions and penalties for non-maintenance of buildings; non-compliance with the regulations; use of substandard materials and errant professionals resulting to increased building failure killing and maiming many people due to impunity of Developers, Contractors and professionals. This is against the constitutional dispensation of the Constitution of Kenya (2010), which provides in Article 24(1) the right to life for every citizen and goes on to provide that such a right cannot be denied which is the bedrock of all policies and legislation that govern all sectors. The housing policy has been under review to match the new constitutional dispensation, a situation which has hindered the realization of critical milestones towards safety in the industry.

The study further establishes that there are inadequate operational laws governing Kenya's building sector and that there are inadequate legal/regulations enforcement procedures within the building industry and the existence of many pieces of regulations scattered in many statutes complicates implementation of building procedures. The study also found out that developers inadequately comply with the existing building laws and codes of practice and that the administration of the various statutes by several agencies affects the efficiency and coordination in enforcing building laws. The study sought to determine the influence of the legal framework on mitigating of building failures in Kenya where the following hypotheses were formulated:

H_0: Legal Framework has no significant influence on mitigating building failures in Kenya

Regression analysis was conducted on the legal framework and it was found out that a proportion of mitigating building failures in Kenya can be attributed to legal factors. ANOVA model for legal framework was found to be statistically significant testing at 5% significance level using a one tail test where the p-value was 0.000 which is less than 0.05. The null hypothesis was rejected thus concluding that the legal framework has a significant influence on mitigating building failures in Kenya.

5.2.4 Influence of Institutional Framework on Mitigating Building Failures in Kenya

The study found that National Construction Authority is the most relevant institution when it comes to mitigation of building failures in Kenya as supported by 61% of the respondents, followed by county government, Ministry of Transport, Infrastructure, Housing and Urban Development (MTIHUD) and the National Building Inspectorate (NBI). It was also determined that lack of personnel was the leading factor that hinders institutions from mitigating building failures, lack of financial resources was the second leading factor followed by lack of equipment as the least hindrance that affects institutions mandated to manage the building sector to perform their mandate of inspection and supervision of construction process.

These findings support the finding of a study that was conducted by Schotter (1981) which stated that people respect rules depending on how the institutions behind them conduct themselves; they interpret rules according to the weight the parent institutions give them. Weak institutions result from not being able to follow up on rules with disincentives and deterrent sanctions. Regular periodical inspections were the best way in which institutions use to mitigate building failures in Kenya following a response by the majority of the respondents as given in the study. The other way in which institutions mitigate building failures in the country is through law enforcement and finally the policy enforcement also plays a major role in mitigating building failures in the country.

The study reveals that the institutions are affected by the lack of personnel to cover the existing geographical locations which is wider and inadequate finance for effective operation of the institutions. The study also indicate that the existing institutions do not perform regular inspections that help in the mitigation of building failures as well as policy and law enforcements which are very instrumental in mitigating building failures in the country; this finding is supported by a study conducted by Billington (2014) who stated that setting out the premise for regulation is the backing of law and regulations within the sector. This implies that there is need for clear regulations in the building sector for effective supervision and monitoring as this would help in mitigating building failures.

The study further reveals existence of conflict between institutions comprising national government and county government and other institutions managing the building sector. There is also no coordination and integration of functions among the state agencies within the building sector, which is further complicated by inadequate personnel, finance and equipment to put in place various associated quality assurance procedures by the agencies.

The study sought to establish the influence of the institutional framework on mitigating building failures in Kenya, the following hypotheses were formulated:

H_0: Institutional Framework has no significant influence on mitigating building failures in Kenya

The hypothesis test was conducted using ANOVA model to find the relationship between institutional framework and mitigation of building failures, the model was found to be statistically significant in testing the hypothesis since the p-value was 0.000 which is less than 0.05 testing at 5% significance level using a one tail test. Hence the null hypothesis rejected and the study concludes that institutional frameworks has a significant influence on mitigating building failures in Kenya.

5.2.5 Influence of Contextual Framework on Mitigating Building Failures in Kenya

The study sought to establish the influence of contextual framework on mitigating building failures in Kenya. The study found out that compromise and bribery takes place during supervision and inspections of buildings resulting to poor or no inspection during various construction stages, during the design approvals resulting to poorly designed buildings being approved and also during certification of building process where faulty buildings are certified and issued with completion certificate and eventual occupation certification. This study finding is similar to the study carried out by Omollo, (2019) which concludes that the building industry is exposed to many cultural issues including unethical behavior and unfair competition which are a breeding ground for corruption in the industry. The poor design approval during certification of the building are caused by corruption situation. This is also supported by William (1995), who revealed that corruption and unethical practices have affected building sector by contributing to the building failures in the circumstances that surround the entire building system. The study noted that building professionals contribute to building failures by accepting bribe making them participate in unprofessional practices since the building professionals do not follow building regulations and standards thus contributing to building failures through use of faulty designs. The study findings further reveals that there are cases of compromising officials' involved in the inspection of buildings and also technical personnel usually run multiple construction projects at any given time making them pay less attention during inspections. The study sought to find out the influence of contextual framework on mitigation of building failures in Kenya, the following hypotheses were formulated:

H_0: Contextual Framework has no significant influence on mitigating building failures in Kenya

Regression analysis on the contextual framework found out that a proportion in mitigating of building failures in Kenya can be attributed to contextual factors. ANOVA model indicated the P-value was 0.000 which is less than 0. testing at 5% significance level using a one tail test thus the null hypothesis was therefore rejected. The researcher then

concludes that the contextual framework has a significant influence on mitigating building failures in Kenya.

5.3 Conclusion

Based on the set objectives, the researcher, therefore, concludes the findings of the study as follows:-

5.3.1 Influence of the Policy Framework on Mitigating Building Failures in Kenya

The study found out that the relevant authorities that are charged with the implementation of the policies have not ensured that every professional in the industry have proper awareness of the policies since everyone in the industry should be aware of the relevant policies in the sector. The finding indicated that professionals in the building industry mostly adopt construction policy while maintenance policy is least adopted. This is an indication that the policy making process is not all inclusive particularly involvement of building professionals and stakeholders.

The findings that the policy framework has significance influence in mitigating building failure indicates the importance the sector must place on policies guiding the sector.

5.3.2 Influence of the Legal Framework on Mitigating of Building Failures in Kenya

The study found out that building by-laws and building regulations are the most used legal instruments and the existing legal framework has inadequate sanctions and penalties for the: non-maintenance of buildings; non-compliance with the regulations and use of substandard materials and errant professionals. The study further established that developers inadequately comply with the existing building laws and codes of practice and that administration of various statutes by several agencies affects the efficiency and coordination in enforcing building laws. The study found that there is lack of adequate compliance with the existing laws among building professionals and there are inadequate sanctions and penalties on unprofessional practices.

The existing building laws and particularly the building code of 1968 is outdated and inadequate. The Building Standards and materials/components specifications due to technology advancement and the dynamism in the sector have tremendously challenged the current building code of 1968.

The study finally concludes that due to lack of comprehensive adequate policy that anchors the law means that the existing legal framework is inadequate, out dated and is poorly implemented which is a major cause for building failures in the country.

5.3.3 Influence of the Institutional Framework on Mitigating of Building Failures in Kenya

The study established that lack of personnel to cover the existing geographical locations for inspections and supervisions during the regular working hours as a major challenge hence most constructions go uninspected. Further, lack of finance and equipment makes institutions managing building sector unable to implement their mandate particularly carrying out regular periodical inspection and material, structural and integrity testing. The institutions are not well anchored in the policy and subsequent laws and therefore weakness in implementation of their mandate.

This is simply due to weak policies resulting in weak laws and establishing weak institutions.

5.3.4 Influence of the Contextual Framework on Mitigating of Building Failures in Kenya

The study determined that compromise and bribery occurs in design, during approval of building plans, inspections of building during construction and certification of buildings leading to building failures in most cases where there is improper construction works. The study also noted professional negligence where building professionals do not adequately follow building policies, building regulations and building standards and that they contribute to building failures through use of faulty designs and by running multiple

construction projects at any given time making them pay less attention. Professionals involved in bribery cases do not conduct required inspection and award certificate to buildings that have not met the required standards leading to building failure.

The use of unprofessional ethics among professionals and developers using non-professional to manage construction works are also major challenges. Contractors also bribing inspection officers on the use of substandard materials and following unprocedural construction practices.

5.4 Recommendations

5.4.1 Influence of Policy Framework on mitigating building failures

The quality of the existing policies are wanting, archaic and non-inclusive making enforcement rather a challenge. Weak policies have equally resulted in weak laws and weak institutions because both the law and institution should be anchored in a policy otherwise lack of clear policy leads to disjoined legislative efforts. According to Sapru, 2009, the proper way to make law is to begin from identifying the sector challengers and then weaving solid policy grounds and direction for sector after which attendant laws and regulations can be made.

The study recommends review and harmonisation of the existing policies and to develop a comprehensive building policy that covers all aspects of planning, construction, risk management, maintenance, destruction, disposal and establishes legal and institutional framework for policy implementation. The policy formulation should be all inclusive involving all shareholders, National and County Governments including public participation for ownership to enable implementation and enforcement.

5.4.2 Influence of the Legal Framework on mitigating of Building Failure

The study found out that the existing Building Code (1968) is archaic and outdated considering new building trends, materials and complex construction technologies. The

existing Acts of Parliament establishing NEMA and NCA and others pieces of legislation governing the building sector do not provide adequate penalties and sanction punitive for non-compliance.

The study recommends the review of current building code and other pieces of legislation governing the building sector to include strict penalties and sanctions for non-compliance and provide clear delineation between the County government and National Government and the institutions mandated to check quality assurance and compliance.

The law should create a legal entity to harmonise administration and implementation of the building laws to ensure efficiency and coordination in the building sector. The legal entity should continuously review the building regulation and other laws affecting building taking into account new building trends and dynamism in the building sector including new building materials, technology and designs.

5.4.3 Influence of Institution Frameworks in mitigating building failures

The institutions mandated to govern the construction sector are not adequately anchored in policy or law. This has created weak institutions which is further compounded by lack of both human and financial resources to undertake their mandate. The County Government lacks professionals, equipment and finance to undertake inspection of buildings under construction and post construction in their jurisdiction.

The study recommends that institutions governing the building sector should be adequately anchored in the policy and the law. The laws should be clear and properly demarcate the mandate of each institutions to avoid conflict. The study also recommends establishment of a legal entity that provides leadership in building sector as well as to harmonize and oversee implementation of the regulation and able to apportion any building failure to respective institution to take remedial measure and to effect coordination.

5.4.4 Influence of Contextual Frameworks in mitigating building failures

The study indicates that there is compromise and bribery in approval of building plans, inspection of buildings during construction and issuance of certificates including completion and issuance of occupation certificate. Also professional negligence in design, bribery and use of unprofessional practices. Contractors ignore the building standards and corruptly influence approvals and compromise officials involved in inspection of building during or after construction.

The study recommends a one stop approval process involving all approving authorities which include the County, NCA, NEMA and reduce human interface by computerising the approval process. The inspection should be periodic and carried at every stage of construction and where the county lacks adequate professionals to undertake inspection, this can be contracted to practicing professionals or professional bodies. This will minimize compromise in building design which leads to structural failure and total collapse and also bribery in the approval process and non-compliance to regulations/standards. Professional bodies should punish errant profession for any malpractice or negligent on professional design or deregister them from practicing.

5.5 Contribution of the study to Theory/existing knowledge

The study developed a theoretical framework with anchoring theories being System Theory, Power Elite Theory, Deontological Theory and Institutional Theory.

5.5.1 System Theory

The study places building process as a system with policy, laws and institutions that must be interrelated and coordinated in a manner to achieve performance of the building sector. The theory underlines the synergies that are required in the sector from all stakeholders particularly institutions and players out to move together as a system in order to deliver efficiently. The institutional relationship among the construction managing institutions must be maintained within the sector intra and interrelationships. Intra-relationship in

view of the theory being the relationship among all institutions as a network while interrelationships is internal institution arrangement within each institution guided by its policy and the law in order to play in the sector.

5.5.2 Power Elite Theory

The study further found that the policy formulation does not involve all stakeholders and they are not inclusive and this may explain the poor implementation and enforcement. This is in line with the Power Elite Theory that posits that policies and decisions are made by Elite that have positions of influence and power. The study advises on all inclusive construction policy that involve all building sector players in its formulation, implementation and enforcement.

5.5.3 The Deontological Theory

This theory recognizes that law and morality are deeply connected and describe duties that people have towards one another. The construction of a building entails the contractor, developer, professionals, and institutions charged with managing the sector. The theory is based on the principal of duty of care each one owns towards one another. The theory advocates against unethical practices that include compromise in building approval process, bribery in the inspection of building, use of substandard materials, use of quacks and unprofessional behaviours, that have resulted in building failure killing or maiming the beneficiaries who are owned duty of care by the developers and professions.

5.5.4 Institutional Theory

The building process occurs within a given environment and managed within policy, legal and institutional arrangement. This theory advocates environment impact on organisation and responsive restructuring addressing the environmental needs. The building failure in Kenya dates back in 1990's and various institutions/laws and regulations have been developed to address the situation and some recommendation that include review of the

laws have not been implemented. The study recommends establishment of legal entity and review of laws to address the increase in building failure in the county.

5.5.5 Existing knowledge

Most studies in the building failure are technical in nature mostly in design, structure failure, workmanship, quality of materials that have direct relationship to building failure. This study introduces another dimension addressing the governance frameworks that includes policy, legal, institutional and contextual framework and their significant in mitigating building failures.

The significant of governance framework provides a proactive approach that deals with prevention rather than reactive where government only addresses the issue when a building collapses causing death or injury. There is need for a clear organized development control with a detailed prerequisite for building approvals with stringent checks on design failure and weaknesses. This can be achieved through a comprehensive policy framework and legislative provisions for management of the building sector.

5.6 Suggested Areas for further Study

The construction industry comprises buildings and other infrastructure facilities which include roads, bridges and dams. This study was about the influence of Governance Frameworks on mitigating building failure and therefore does not address the other branch of the construction industry. The study recommended a research to be undertaken on the influence of governance framework on mitigating failure and collapse of infrastructure facilities. The infrastructure is a sub-sector which supports the building subsector of the construction industry in Kenya that experiences similar challenge.

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APPENDICES

Appendix I: Introduction Letter

Chief Executive Officer

P.o. Box ……..

Nairobi

Dear Sir,

RE: ACADEMIC RESEARCH PROJECT

I am a PhD student at Jomo Kenyatta University of Agriculture and Technology (JKUAT). I wish to conduct a research entitle *"Influence of Governance Framework on mitigating Building Failures in Kenya"*. A questionnaire has been designed and will be used to gather relevant information to address the research objectives of the study. The purpose of writing to you is to request for permission to collect information on this important subject from randomly selected members of your staff.

Please note that the study will be conducted as an academic research and the information provided will be treated in strict confidence. Strict ethical principles will be observed to ensure confidentiality and the study outcomes and reports will not include reference to any individuals.

Your acceptance is highly appreciated.

Yours Sincerely,

Patrick Mwenda Bucha

Appendix II: Sample Questionnaire

This research seeks to establish the influence of governance framework on mitigating causes of building failure. Your honest views on the questions are of great importance to the study. Please answer all the questions to the best of your ability. The information provided will be treated with utmost confidentiality.

SECTION A: DEMOGRAPHIC DETAILS

Please tick (√) your perceived relevant response to each of the questions below

1. **Age bracket**
   - 0 – 30 years ( )
   - 31 – 40 years ( )
   - 41 – 50 years ( )
   - 51-60 years ( )
   - Above 60 years ( )
2. **Sex**
   - Male ( )
   - Female ( )
3. **Level of Education**
   - Certificate ( )
   - Diploma ( )
   - Bachelors ( )
   - Masters ( )
   - Doctorate ( )
   - Other [*Please specify*] ……
4. **Employer**
   - National Government ( )
   - County Government ( )
   - National Construction Authority ( )

National Buildings Inspectorate ( )

KEBS ( )

EBS ( )

BORAQS ( )

Other [*please specify*] ……

5. **Department**

Legal ( )

Quality Assurance ( )

Research ( )

Compliance ( )

Planning ( )

Enforcement ( )

Development Control ( )

Other [*please specify*]

……..

6. **Profession**

Planner ( )

Engineer ( )

Architect ( )

Quantity Surveyor ( )

Construction Manager ( )

Legal Practitioner ( )

Researcher ( )

Housing Officer ( )

Artisan ( )

Building Inspector ( )

Other [*please specify*]

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SECTION B: INFLUENCE OF POLICY FRAMEWORK ON MITIGATING BUILDING FAILURE IN KENYA

Use the Likert-scale where Strongly agree [5], Agree [4],* Neither Agree nor Disagree *[3],* Disagree [2], Strongly Disagree *[1], and kindly tick (√) the degree of agreement with the statements provided below:

	Statement	**1**	**2**	**3**	**4**	**5**
7.	There exists a comprehensive building policy in the country					
8.	There is adequate harmonization of the multiple policies guiding the building sector					
9.	Stakeholders in the building sector are fully aware and conversant with the existing policies governing the building sector					
10.	There are adequate policies guiding all the areas within the building sector					
11.	There is adequate implementation and enforcement of building sector policies					
12.	There is continuous review and audit of building sector policy implementation and success					
13.	Stakeholders in the building sector adequately comply with the existing building policies					
14.	There is continuous reference to the laid down policies in all building processes					

15.	The existing building policies are clearly defined and communicated to stakeholders					
16.	Adherence to the building policy reduces building failures					
17.	Existing building policy is operationalized through the building regulation					
18	Existing policies covers safety and risk management practices					
19	Existing building policies covers building sustainability					
20	Building policies are formulated through participation of all building stakeholders					
21	Building polices specify maintenance requirements					

Please tick (√) where appropriate and kindly explain where necessary.

22. The existing building policies include: -

(i) National Housing Policy ( )

(ii) ConstructionPolicy ( )

(iii)Building Policy ( )

(iv)Maintenance Policy ( )

Any other (please specify

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23. The building Policies have the following provisions to mitigate building failures

(i) Safety and Risk management ( )

(ii) Quality of materials ( )

(iii)Workmanship ( )

(iv)Inspection of buildings ( )

(v) Structural requirements ( )

Any other (please specify)

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24. The Building Policies are anchored in

(i) Regulations ( )

(ii) Constitution ( )

(iii)Building Code ( )

(iv)Laws ( )

(v) Specification and Standards ( )

(vi)Contracts ( )

Any other (please specify)

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25. Building Policies are formulated by:-

(i) NCA ( )

(ii) NHC ( )

(iii) NBI ( )

(iv) MTIHUD ( )

(v) County Governments ( )

(vi) Stakeholders ( )

(vii) Parliament ( )

Any other (please specify)

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26. Building Policies are implemented by

(i) NCA ( )

(ii) NHC ( )

(iii) NBI ( )

(iv) MTIHUD ( )

(v) County Governments ( )

Any other (please specify)

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SECTION C: INFLUENCE OF LEGAL FRAMEWORK ON MITIGATING BUILDING FAILURES IN KENYA

Use the Likert-scale where Strongly agree [5], Agree [4],], **Neither Agree nor Disagree** ***[3],*** **Disagree [2], Strongly Disagree** ***[1], and kindly tick (√) the degree of agreement with the statements provided below:***

	Statement	**1**	**2**	**3**	**4**	**5**
27	There are adequate operational laws governing Kenya's building sector					
28	The existing legal framework adequately supports the successful implementation of building policies					
29	Multiplicity of laws and regulations guiding building sector impact negatively to the sector					
30	There is a comprehensive and integrated legal framework guiding operations in the building industry					
31	Existence of many pieces of regulations scattered in many statutes complicates implementation of building procedures					
32	There are adequate legal/regulations enforcement procedures within the building industry					

33	The building laws and regulations are clearly defined					
34	Stakeholders in the building sector are fully aware and conversant with the existing sector laws and regulations					
35	Complexity and ambiguity of building laws and regulations affects the effectiveness in enforcement of building laws					
36	The administration of the various statutes by several agencies do not affect the efficiency and coordination in enforcing building laws					
37	Selective application of the laws causes building failure					
38	Developers adequately comply with the existing building laws and codes of practice					
39	There is adequate legal provision for decommissioning aged buildings					
40	There is adequate legal provision of building maintenance					
41	There are sanctions and penalties for law/regulation defaulters					

Please tick (√) where appropriate and kindly explain where necessary.

42. The following legal framework exist in building sector

(i) Building Code ( )

(ii) Building Regulation ( )

(iii) Building Contracts ( )

(iv) Building by-lays ( )

Any other (please specify)

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43. The legal framework has adequate sanctions and penalties for

(i) Errant contractors ( )

(ii) Errant professionals ( )

(iii) Use of substandard materials ( )

(iv) Non-compliance with regulations/specifications ( )

(v) Non-maintenance of buildings ( )

Any other (please specify)

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44. The legal framework adequately specifies

(i) Quantity of building materials ( )

(ii) Periodic Inspection of buildings under construction ( )

(iii) Demolition of substandard buildings ( )

(iv) Structural requirements ( )

Any other (please specify)

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45. The existing building laws and regulations

(i) Adequately mitigates building failures ( )

(ii) Do not adequately mitigates building failures ( )

(iii) They are obsolete ( )

Any other (please specify)

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SECTION E: INFLUENCE OF INSTITUTIONAL FRAMEWORK ON MITIGATING BUILDING FAILURES IN KENYA

Use the Likert-scale where Strongly agree [5], Agree [4], **Neither Agree Nor Disagree** ***[3],*** **Disagree [2], Strongly Disagree** ***[1], and kindly tick (√) the degree of agreement with the statements provided below:***

	Statement	**1**	**2**	**3**	**4**	**5**
46	There is complexity in the institutional arrangement for overseeing the building sector					
47	There are multiple institutions and agencies with legal mandates in the governance of the building sector					

48	There is high coordination and integration of functions among the state agencies within the building sector					
49	Multiplicity of institutions with different mandates and jurisdiction brings conflicts in the functionality of building industry					
50	The agencies overseeing the building sector are adequately staffed with qualified personnel					
51	Inadequate financial allocation to regulatory and supervisory agencies affects their ability to realize their mandates					
52	Inadequate capacity of regulatory and supervisory agencies limits supervision and inspection of buildings as procedure require					
53	There are unaccredited checkers/inspectors within the building sector					
54	Regulatory and supervisory agencies have adequate equipment to put in place various associated quality assurance procedures					
55	There are adequate institutions managing building sector					
56	There is co-operation and coordination among all regulatory and supervisory agencies					
57	The roles of National and County Governments in the building industry are clearly defined					
58	The existing institutional framework mitigates building failure in Kenya					

Please tick (√) where appropriate and kindly explain where necessary.

59. Following institutions mitigate building failures

(i) NCA ( )

(ii) NBI ( )

(iii) MTIHUD ( )

(iv) County Governments ( )

Any other (please specify)

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60. Following institutions are responsible for building failures

(i) NCA ( )

(ii) NBI ( )

(iii) MTIHUD ( )

(iv) County Governments ( )

Any other (please specify)

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61. The institutions in building sector are anchored in:-

(i) National Housing Policy ( )

(ii) National Construction Authority Act ( )

(iii) Government Circulars ( )

(v) County Governments Act ( )

Any other (please specify)

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62. Institutions have not been able to mitigate building failures due to:-

(i) Lack of finance ( )

(ii) Lack of personnel ( )

(iii) Lack of equipment ( )

Any other (please specify)

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63. How do institutions mitigate building failures?

(i) Regular inspections ( )

(ii) Enforcement of the law ( )

(iii) Enforcement of policy ( )

Any other (please specify)

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64. Building failures is due to:-

(i) Many institutions managing the building sector ( )

(ii) Conflict between institutions ( )

(iii) Conflict between National and County Governments ( )

Any other (please specify)

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SECTION F: INFLUENCE OF CONTEXTUAL FRAMEWORK ON MITIGATING BUILDING FAILURES IN KENYA

Use the Likert-scale where strongly agree [5], Agree [4], **Neither Agree Nor Disagree** ***[3],*** **Disagree [2], Strongly Disagree** ***[1], and kindly tick (√) the degree of agreement with the statements provided below:***

	Statement	**1**	**2**	**3**	**4**	**5**
65	The existing disciplinary mechanisms for malpractices within the building sector are highly effective					
66	There has been an increased number of corruption related cases in the building sector					
67	Agencies managing the building sector are actively instilling ethical culture in the building sector					

68	The level of non-compliance to quality assurance in the building sector is high					
69	There is adequate professional inspection of materials during construction process					
70	The cases of compromising officials' being involved in the inspection of buildings during or after construction are high					
71	Most contractors fully comply to approved building designs and standards					
72	There are cases of involvement of unqualified personnel not registered by professional bodies in building designs and supervision					
73	There is required workmanship throughout the construction processes					
74	Contractors comply with the set building sector specifications and standards					
75	Technical personnel attached to construction works fully devote themselves in particular constructions site					
76	Technical personnel usually run multiple construction projects at any given time					
77	All contractors are professionally qualified to handle construction projects					
78	There are high cases of officers being compromised during the building approval					

Please tick (√) where appropriate and kindly explain where necessary.

78. Building failures can be attributed to compromise in

(i) Design approval ( )

(ii) Inspection of buildings during construction ( )

(iii) Certification of buildings ( )

Any other (please specify)

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79. Building professionals have contributed to building failures in

(i) Use of unprofessional practices ( )

(ii) Compromise in design ( )

(iii)Non-compliance with building regulations/standards ( )

(iv) Bribery in building approval and inspection ( )

Any other (please specify)

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80. Professionals in building sector are

(i) Regulated ( )

(ii) Unregulated ( )

(iii) Have Code of Practice ( )

(iv) Deregistered if involved in unprofessional behavior ( )

Any other (please specify)

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SECTION G: MITIGATING BUILDING FAILURES IN KENYA

Use the Likert-scale where strongly agree [5], Agree [4], **Neither Agree Nor Disagree** ***[3],*** **Disagree [2], Strongly Disagree** ***[1], and kindly tick (√) the degree of agreement with the statements provided below:***

	Statement	**1**	**2**	**3**	**4**	**5**
81	Most of the buildings in urban centres have been converted into different uses other than the purposes for which they were registered for					
82	There is periodical inspection and supervision during construction period					
83	The existing conflict between the many institutions that deals with building construction and supervision leads to building failures					
84	Lack of enforcement of building laws/codes in the country contributes to building failures					

85	The lack of good will to comply with the existing building laws by the building construction industry players contributes to building failures					
86	Institutions charged with approval/inspection and certification lack capacity to implement the mandate					
87	The high level of corruption that exist in the approval process and the inspection of buildings leads to building failures					
88	Building professionals do get engaged into irregular approvals of buildings thus leading to building failures					
89	Lack of clarity of building policy leads to building failures					
90	Lack of stakeholder engagement in the periodic review and improvement of the building policy leads to building failures					
91	Lack of implementation of building policy by the stakeholders leads to building failures					
92	Buildings are registered according to use					

Please tick (√) where appropriate and kindly explain where necessary.

92. The following are major causes of building failures in Kenya

(i) Faulty design ( )

(ii) Poor workmanship ( )

(iii) Lack/Poor maintenance of buildings ( )

(iv) Use of substandard material during construction ( )

(v) Unapproved change of user ( )

(vi) Use of unapproved drawings for construction ( )

(vii) Corruption among the regulatory and supervision institutions ( )

(viii) Professional negligence in design, approval and inspection during construction ( )

(ix) Use of unregistered contractors who lack necessary construction skills/knowledge ( )

(x) Use of unregistered professionals in design and supervision ( )

Any other (please specify and comment)

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93. The following are mitigating factors to building failures in Kenya

(i) Enforcements of buildings laws and regulations ( )

(ii) Adherence to building policy ( )

(iii) Proper coordination among the regulatory and supervisory Institutions ( )

(iv) Periodical inspection during construction and post construction in order to detect any defects ( )

(v) Periodical maintenance of buildings ( )

(vi) Approved change of user ( )

(vii) Curbing corruption in all stages from approval to construction stage ( )

(viii) Use of approved building materials and components ( )

(ix) Use of registered Contractors ( )

(x) Use of registered building professionals ( )

(xi) Adequate capacity in regulatory and supervisory institutions ( )

(xii) Registration of all buildings according to the use ( )

Any other (please specify and comments)

.....

Appendix III: List of Institutions

National Construction Authority
National Building Inspectorate
Kenya Bureau of Standards
Professional Bodies
BORAQS
EBK
Ministry of Transport, Infrastructure, Housing & Urban Development
Department of Engineering (structural)
Department of Engineering (Mechanical)
Department of Engineering (Electrical)
Department of Materials Technology
Department of Architecture
Department of QS
Department of Housing
County Governments
Nairobi
Mombasa
Kisumu
Nakuru
Kiambu
Kisii
Kericho
Machakos
Uasin Gishu
Kakamega
Garissa

Appendix IV: NACOSTI Letter

NATIONAL COMMISSION FORSCIENCE, TECHNOLOGY ANDINNOVATION

Telephone:+254-20-2213471,
2241349,3310571,2219420
Fax: +254-20-318245,318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/18/12644/20847** Date: **26th January, 2018**

Patrick Mwenda Bucha
Jomo Kenyatta University of
Agriculture & Technology
P.O. Box 62000-00200
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Influence of governance framework on mitigating causes of building failures in Kenya"*** I am pleased to inform you that you have been authorized to undertake research in **All Counties** for the period ending **26th January, 2019.**

You are advised to report to **the County Commissioners and the County Directors of Education, All Counties** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

GP Kalerwa
GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioners
All Counties.

The County Directors of Education
All Counties.

National Commission for Science, Technology and Innovation is ISO:9001: 2008 Certified