

**IMPACT OF REGULATORY FRAMEWORK ON  
PERFORMANCE OF BUILDING CONSTRUCTION  
PROJECTS: A CASE STUDY OF MURANGA COUNTY**

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**Impact of Regulatory Framework on Performance of Building Construction  
Projects in Kenya: Case Study of Murang'a County**

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## DECLARATION

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

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## **DEDICATION**

This research is a special dedication to my loving wife Millicent Buong' and our daughters; Tekla Nazneen and Natalie Elianna, blessings for which I am truly humbled; and to the Almighty God for the wisdom and gift of life that has made this a reality and till the conclusion of this study. I thank God for the comfort of serenity during my studies from coursework to research.

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## ACRONYMS AND ABBREVIATIONS

<b>AAK</b>	Architectural Association of Kenya
<b>BORAQS</b>	Board of Registration for Architect and Quantity Surveyors
<b>CAK</b>	Competition Authority of Kenya.
<b>CIDB</b>	Construction Industry Development Board
<b>GDP</b>	Gross Domestic Product
<b>GNP</b>	Gross National Project
<b>CPD</b>	Continuous Professional Development
<b>EBK</b>	Engineers Board of Kenya
<b>EIA</b>	Environmental Impact Assessment
<b>EMCA</b>	Environmental Management and Coordination Act
<b>DOSH</b>	Directorate of Safety and Health
<b>IQSK</b>	Institute of Quantity Surveyors of Kenya
<b>KERB</b>	The Kenya Engineers Registration Board
<b>MCG:</b>	Murang'a County Government
<b>NCA</b>	National Construction Authority
<b>NCC</b>	National Construction Code
<b>NEMA</b>	National Environment Management Authority
<b>NHC</b>	National Housing Corporation
<b>SPSS</b>	Statistical Package for Social Sciences

**IQSK** Institute of Quantity Surveyors of Kenya

**QS** Quantity Surveyor(s)



## ABSTRACT

In Kenya, there has been increased number of collapsed buildings despite the existence of various regulatory frameworks. In Murang'a County for instance, between 2017 and 2021, 4 building structures collapsed. This is happening despite the regulatory framework operating in the building construction industry in Kenya. This has put into doubt the regulatory framework operating in the building construction industry, hence, there was need for empirical research into the effect of regulatory framework on performance of building construction projects in Murang'a County. The specific objectives were to assess the existing approval processes in building construction projects in Murang'a County, to investigate the effect of professional, national, and county regulatory practices on performance of building construction projects in Murang'a County, and to model the impacts of regulatory practices on performance of building construction projects in Murang'a County. The study adopted a mixed descriptive survey research design. The target population for the study comprised 260 professionals, supervisors, and contractors involved in the building construction industry in Murang'a County. They included 10 Public Health Officers, 10 Sub county Planners, 7 Chief Officers, 22 Environmental Impact Assessment experts, 14 National Environment Management Authority Officers, 14 National Construction Authority Officers, 40 Developers, 28 Engineers, 28 Architects, 43 Site Supervisors, 44 Contractors. A sample of 158 was used in the study. The study adopted cluster, proportionate, and purposive sampling techniques. Data was collected through questionnaire, interviews, and Focus Group Discussions. Descriptive and inferential statistics were used for data analysis. The overall result of the findings indicated that regulatory framework was statistically significant in explaining the performance of building construction projects in Murang'a County, while for respective predictors: Existing approval processes and Murang'a County Government regulatory practices had significant negative effect on performance of building construction projects; while Professional regulatory practices and National regulatory practices had positive significant effect on performance of building construction projects. It was concluded, that all the three constructs of regulatory framework, individually, had impacted on the performance of the building construction projects to a moderate extent, while the overall regression statistics showed that regulatory framework was strongly associated with performance of building construction projects in Murang'a County. The study recommends that all the regulatory authorities at the professional, national, and county government levels should improve the existing approval processes by reducing waiting time, removing duplication, and automating the systems; discourage unethical practices by introducing stiff penalties and sanctions against professionals and contractors who are found to engage in unethical behaviors like bribery and noncompliance with prescribed regulatory framework, and Murang'a County Government should improve regulatory services by building capacity, employing more staff, minimizing costs, and conducting regular monitoring and supervision of the building construction projects

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background Information

Despite the regulatory framework to regulate the construction industry, cases of collapsed buildings are common phenomena worldwide and especially in the developing countries (World Bank, 2016). In India, in 2012 more than 2,600 people died and 850 were injured and 2,737 building structures collapsed (World Bank, 2016). In 2013, a commercial building collapsed in Bangladesh, killing 547 and about 2,500 got injured; investigation discovered that the building collapsed due to noncompliance with building regulations (Corbett, 2015). In Kenya, a report by National Construction Authority (NCA) indicated that 87 buildings (residential, commercial and mixed use developments) had collapsed between 2021 and 2022 (Tongola, 2022; Wambua & Otieno, 2018). Reasons given for the collapses are weak regulatory frameworks and incompetent enforcement (Corbett, 2015).

According to Ghosh (2004), it is the responsibility of regulating authorities in the building construction industry to ensure that contractors strictly adhere to the code of conduct prescribed for them. The regulatory framework ensures that construction processes are conducted according to the set standards of quality, competence, and efficiency (Bucha *et al.*, Okello, 2020). Ghosh (2004) asserts that building regulations specify lowest standards for building to ensure health, safety, as well as the wellbeing of the occupants and the environment. Similarly, Ayedun *et al.*, (2012) posit that building regulations are meant to match best practices, materials, methods, as well as processes to construct a building that is fit for use.

In the United Kingdom, regulations and standards are the core in UK government's strategy to enhance performance of new construction by ensuring quality maintenance and improvement (Bousmaha *et al.*, 2006). Building Control Bodies (BCBs) have been set up to ensure that Building Regulations are complied with, accordingly in all building projects (Bousmaha *et al.*, 2006). In Australia, the National Construction Code (NCC) ensures that contractors comply with technical requirements before

undertaking building construction projects (Doloi *et al.*, 2017). In Malaysia, the Construction Industry Development Board, CIDB, (2004) which is a statutory body operating under Ministry of Works, was established in July 1994. The mandate of CIDB is to direct activities within the construction industry in order to enhance its competitiveness, and to develop the capacity by enhancing quality and productivity through professionalism, innovation, and knowledge (CIDB, 2004).

In South Africa a similar board, Construction Industry Development Board, CIDB has been established by the Construction Industry Development Board Act 38 of 2000. The board was mandated to categorize, register, and provide regulatory framework to guide the operation of the building and construction sector (CIDB, 2000). Reports show that many of the collapsed buildings were due to lack of or noncompliance with building regulations. For instance, collapse of Hotel New World (Singapore), was reported to have been caused by poor design and weak building regulations (Seng, 2011). A study conducted in India by Kumar and Pushplata (2015) that investigated compliance with building regulations, showed that enforcement and surveillance mechanisms to ensure compliance were inadequate. The same study also mentioned lack of enough technical experts to implement the building regulations and ensure compliance with the appropriate regulations; this has hindered the regulatory authorities to halt the numerous illegal and unplanned building constructions.

In Egypt, the Built Environment Observatory discovered that between 2007 and 2019, around 8.2 million housing units had been built illegally without permits (BEO, 2020). Still in Egypt, Elsisy (2019) asserts that intervention policies practiced in Egypt have not been able to effectively solve the problem of illegal construction of buildings. A study in Ghana by Ameyaw *et al.*, (2017) indicated that there was prevalent corruption in the construction industry, especially in the public sector. The study revealed that despite having in place the Public Procurement Act and other subsidiary codes of conduct for the industry professional bodies, corruption still existed (Ameyaw, 2017: 20). It supports the findings of the study by Callistus *et al.*, (2014) in Ghana, which revealed that corruption, non-coordination between designers and contractors, insufficient monitoring and feedback by regulating authorities, and absence of training on quality, were the barriers to regulation. The study sought to find out why despite

the regulatory framework for the building construction industry, building projects are collapsing.

In Kenya, despite the Government of Kenya putting in place regulations to guide the building and construction industry, cases of collapsed buildings are increasing. For instance, a report by the Engineers Board of Kenya, EBK (2012) indicated that in 2018 one building collapsed; in 2020 they were 2; while in 2021 the number sharply increased to 11 buildings. Gacheru and Diang'a (2015), attribute this to rampant corruption in Kenya's building construction industry, where contractors give out bribes in order to get compliance certificates from authorities mandated to regulate the building construction industry. This despite poor workmanship and construction processes, use of poor materials, poor structural designs, absence of documents from relevant authorities approving building projects, lack of proper supervision by professionals, and laxity or corruption involving enforcement officers (Gacheru & Diang'a, 2015).

A study by Bucha *et al.*, (2020) revealed that although legal frameworks helps in mitigating failure in building constructions, some of the laws were obsolete and that the regulatory frameworks were also duplicated. The study also mentioned bribery that compromises standard at inspections, design and approval phases of the building process which exposes buildings to failures (Bucha *et al.*, 2020).

The construction industry is a major driver of Kenya's economy. Kenya National Bureau of Statistics, KNBS (2016), reported that in 2015, the construction industry recorded a prosperous growth rate of 13.6%, and accounted for 7% of Kenya's GDP (Turner & Townsend, 2017). The demand for housing has been caused by growth in Kenya's population. Competition Authority of Kenya, CAK (2017) statistics show that Kenya population was 38.6 million in 2009, and rose to 44.2 million in 2015, which has in turn led to increase in demand for housing especially in the urban areas. The building construction industry in Kenya as in many parts of the world, face regulatory challenges associated to compliance with environmental guidelines and adherence to building practices that has limited the industry performance (Dania *et al.*, 2013).

It can be concluded that although various countries have regulatory framework to regulate the building construction industry, they are not effective as mentioned in various studies (Ayedun *et al.*, 2012; Auma, 2014; Doloi, Week, & Bora, 2017). The collapse of buildings is attributed to many things including; weak foundations, using substandard construction materials, poorly mixed materials by incompetent workers, and overload on strength of building (Fernandez, 2014).

According to Engineers Board of Kenya (2021), 4 building structures collapsed in Murang'a County between 2017 and 2021. It was imperative therefore, to conduct a study to examine the effect of regulatory framework on performance of building construction projects in Murang'a County, Kenya. Studies by Callistus *et al.*, (2014) and Omollo (2019) associates the cases of collapsed buildings to noncompliance with building regulations, inadequate coordination among the stakeholders, lack of qualified staff, inadequate capacity by regulatory authorities, weak enforcement and surveillance, and lack of sensitization of the stakeholders. The current study therefore examined how regulation framework impacts on performance of building construction industry in Murang'a County.

## **1.2 Statement of the Problem**

Many cases of collapsed buildings have been reported in Kenya, causing many deaths and loss of property. Building Audit Report by the National Building Inspectorate (NBI), showed that there were no cases of collapsed buildings in the 80's and 90's (NBI, 2018), however, NCA (as cited in NBI, 2018; Wambua & Otieno, 2018) has reported that 87 buildings had collapsed between 2017 and 2021. A study by Gacheru and Diang'a, (2015) attribute the cases of collapsed buildings in Kenya to poor workmanship and construction processes, use of poor materials, poor structural designs, and absence of documents from relevant authorities approving building projects. Other reasons given by Gacheru and Diang'a (2015) are lack of proper supervision by professionals and laxity or corruption involving enforcement officers.

In Murang'a County for instance, between 2017 and 2021, 4 building structures collapsed (EBK, 2021). This is happening despite the regulatory framework operating in the building construction industry in Kenya. This has put into doubt the regulatory

framework operating in the building construction industry. Moreover, none of the studies conducted on regulatory framework and building construction in Kenya (i.e. Gacheru & Diang'a, 2015; Gichamba & Kithinji, 2019; Wamuyu & Rukwaro, 2020; Kuta & Nyaaga, 2014), were conducted in the context of Murang'a County. These studies also exhibited conceptual, contextual, and methodological gaps which the study sought to fill. Hence, there was need for empirical research into the effect of regulatory framework on performance of building construction projects in Murang'a County.

### **1.3 Objectives of the Study**

#### **1.3.1 The Main objective**

The main objective of this study was to investigate the impact of the regulatory framework on performance of building construction projects in Kenya with Murang'a County as a case study.

#### **1.3.2 Specific Objectives of the study**

- i. To assess the existing approval processes in building construction projects in Murang'a County.
- ii. To investigate the effect of professional, national, and county regulatory practices on performance of building construction projects in Murang'a County
- iii. To model the impacts of regulatory practices on performance of building construction projects in Murang'a County

### **1.4 Research Questions**

- i. What are the existing approval processes in building construction projects in Murang'a County?
- ii. How do professional, national, and county regulatory practices affect the performance of building construction projects in Murang'a County?
- iii. How do the regulatory practices impact performance of building construction projects in Murang'a County?

## **1.5 Scope and Limitations of the Study**

### **1.5.1 Scope of the Study**

**Geographical scope:** The study investigated the impact of the regulatory framework on performance of building construction projects in Kenya with Murang'a County as a case study. Only private developed building construction projects in Murang'a County were considered in the study. The study was conducted in 2021 and covered the seven sub counties in Murang'a County, namely; Gatanga, Kandara, Kiharu, Kangema, Mathioya, Kigumo and Maragwa.

**Theoretical scope:** Regulatory framework is conceptualized as existing approval processes, and professional, national, and county government regulatory practices, while performance of building construction projects indicators are timeliness, cost, quality, and health & safety (Vukomanovic *et al.*, 2010).

**Methodological scope:** The study adopted a quantitative, descriptive survey research design. Data was gathered by means of questionnaire, interviews, focus group discussion, and site observation. Data was analyzed using descriptive and inferential statistics.

### **1.5.2 Limitations of the Study**

In the course of the study, the challenges faced included the unwillingness of some respondents to disclose information. However, they were assured that the study was strictly for academic purposes and information given by them will be confidential. Due to amount of financial resources and time needed to conduct research of this nature, the research was limited to Murang'a County. However, the restriction to only one county creates an opportunity for future studies that will focus on other counties. The busy schedule of the respondents and the amount of work they have at hand, some of the respondents were reluctant to participate in the study. However, the researcher took time to convince them and also gave them adequate time to respond to the questionnaires and the interviews.

## **1.6 Justification of the Study**

Despite there being the professional, national, and county government regulatory framework for the building construction projects, cases of collapsed buildings in Murang'a County and other parts of Kenya is on increasing trajectory. And if this trend is not stopped a lot of investments and lives will continue to be lost. This brings to doubt the effectiveness of the regulatory framework in the Kenyan building construction industry. Therefore, it was imperative to study how the regulatory framework impacts on performance of building construction industry in Murang'a County.

The findings of the study can be used by the Government of Kenya and the regulatory agencies involved in building construction including BORAQS, NEMA, NCA, and Murang'a County, in developing regulations that will guide the building construction sector. This will reduce or eliminate widespread cases of collapsed buildings. The findings of the study contributes to the body of knowledge pertaining to construction project management. Students and researchers in construction discipline will benefit from the findings of this study as a basis for reference and further research. Finally, the study has practical implication to investors in the building construction industry who keen on building quality buildings.



## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter entails conceptual literature related to the study variables, theoretical review and critique of the existing literature, summary of literature review, research gap, and conceptual framework.

#### **2.2 Theoretical Review**

This study has its theoretical framework anchored on public interest theory, proposed and advocated by Becker (1986), who conducted a study on Public Interest Theory.

##### **2.2.1 Public Interest Theory**

According to Shleifer (2005), Public Interest Theory is based on the following assumptions. First, the assumption that unregulated markets regularly do not succeed due monopoly or externalities. Second, the assumption that governments are benevolent and are able to put right the market failures by introducing regulations. Public Interest theory takes the view that governments introduce regulations to control prices to protect consumers from monopolies that would otherwise overcharge them, enforce safety standards to avoid misfortunes such food poisoning, normalize jobs to protect employees from unscrupulous employers, and also protect investors, etc. (Shleifer, 2005).

Public Interest Theory is applicable to this study as it examines the effect of regulatory framework on performance of building construction projects in Murang'a County, Kenya. The regulatory framework comprising of existing approval processes, professional regulatory practices, national regulatory practices and County Government regulatory practices that have been considered in the study are meant to regulate the building construction industry. The building construction industry is exposed to dangers of corruption and non-compliance (Gacheru & Diang'a, 2015), hence, it has to be regulated. The Public Interest Theory was used in the studies by

(Omollo, 2019), to investigate the barriers to effective regulation of the building construction industry. Also in the study by (Wathua, 2020) to assess the effect of regulations on growth of construction companies in Kiambu County Kenya.

However, Public Interest Theory has been criticized in the following ways. First, it is argued that markets conditions and private arrangements can deal with most the market failures, therefore, government intervention and regulation are not required. Second, critics argue that private litigation can deal with some of the conflicts arising between market participants. And third, the critics argue that government regulations are made ineffective by incompetent and corrupt regulators, therefore regulation make the situation worse.

### **2.2.2 The Existing Approval Processes in Building Construction Projects in Murang'a County.**

Regulation in general is a law, rule, or other order prescribed by an authority, especially to regulate conduct (Wathua, 2020). According to the Competition Authority of Kenya (CAK), by regulating various sectors of the economy, the government ensure that consumers are not exploited by the market forces (CAK, 2017). Building regulations are statutory instruments that seek to ensure that the building policies set out in the relevant legislation are carried out (Gelder, 2004).

Peckitt, Glendon, and Booth (2004) highlighted characteristics of the construction industry in developing countries to including Kenya; lack of investment, insufficient construction regulations, weak enforcement, lack of enough resources, inadequate use of technology, inadequate materials, dominance of small companies, insufficient skills and lack of training among others. The regulatory framework is aimed to regulate the industry (CAK, 2017).

In the case of Kenya, the government has formulated various regulation frameworks, including the Board of Registration of Architects and Quantity Surveyors (BORAQS), Architectural Association of Kenya (AAK), Institute of Quantity Surveyors of Kenya (IQSK), National Housing Corporation (NHC), Engineers Board of Kenya (EBK), National Environmental Management Authority (NEMA), County Governments

(Khaemba, 2013; Nasila & Cloete, 2018). However, majority of the regulating agencies lack their own enforcement capacity, as the county government remain in charge of carrying out enforcement measures. As a result, many building construction works do not comply with the regulations as was revealed in the studies by (Auma, 2014; Gacheru & Diang'a, 2015), Whereas compliance to professionalism in the building construction industry is critical to the attainment of quality building projects noncompliance contribute to failure in building construction projects (Wambua & Otieno, 2018). The same view is shared by (Dania, Larsen, & Yao, 2013), who contend that although construction industry is very significant in the world economies, the industry faces regulatory challenges such as compliance with environmental guidelines and adherence to building practices that limit the industry performance.

As suggested by Githenya and Ngugi (2014), building construction projects face major challenges, including quality assurance, cost overrun, not sticking to schedule, safety, and environmental performance. The acquisition of statutory building approvals required by developers has been cited as one of the hindrances to adequate and affordable housing. With the rate of urbanization in Kenya estimated at 32.8% and with annual deficit in housing at 200,000 units, it is inevitable to evaluate the building approval process in order to make it simple and faster. Boadu *et al.*, (2020) identified lack of a single regulatory authority to regulate the operations of the construction industry as main issue affecting the performance of building and construction industry.

According to Wamuyu and Rukwaro (2020), prior to undertaking any building construction project, approval must be sought from various institutions. Some of the institutions involved include, at the national level, the Ministry of Transport, Infrastructure, Housing and Urban Development whose mandate is to supervise Government and public institutions construction projects. Ministry of Health supervises public health matters as well as occupational health and safety in the construction industry. At the local level, the County governments supervises the approval and inspection of building construction projects in their jurisdiction. The activities undertaken by these agencies continue to be mostly disjointed and not coordinated (Kimani & Musungu, 2010).

There are genuine concerns in the issuance of permits for construction. A study by Wamuyu and Rukwaro (2020), revealed that challenges faced when seeking building construction approval include need for multiple permits and legislation from various institutions, long waiting period in acquiring approval, and improbability in approval time, corruption, and high costs involved in approval process. World Bank report (2015) intimates that the process of approval takes long and permits charges are high. This further makes the construction sector expensive. Other challenges are non-commitment from approval officers and inspectors, inadequate checks by personnel involved in approval, and political interference (Wamuyu & Rukwaro, 2020). Another challenge that affect the effective implementation of these laws and regulations is due to the involvement of several institutions; which all have overlapping processes that affect their effective implementation (Njoh, 1992).

### **2.2.3 Professional, National, and County Regulatory Practices on Performance of Building Construction Projects in Murang'a County**

The contribution of various professionals in the building construction industry is important for the successful performance of building construction projects (Corbett, 2015). The professionals include architects, engineers, land surveyors, quantity surveyors, and environmental experts among others, who are relevant to different aspects of building construction projects. The professional bodies that govern the works of these professionals in the Kenya construction industry include BORAQS, AAK, IQSK, and EBK (Nasila & Cloete, 2018).

BORAQS was established and given the major responsibility of regulating the professionals in Architectural and Quantity Surveying. To perform its duties and responsibilities, the body does training, registrations, and encouragement of ethical conducts within the construction industry (Institute of Quantity Surveyors of Kenya, 2023)

The Kenya Engineers Registration Board (KERB) was formed in 1969 to monitor activities and conduct of engineers in Kenya. KERB was replaced by the Act in 2011, which created the Engineers Board of Kenya in order to strengthen the role played by Kenyan engineers (Engineers Board of Kenya, 2012). EBK's mandate is to ensure that

proficient engineers and engineering works of good quality are produced, by providing regulation, building capacity of engineers, and ensuring that set engineering standards are complied with (CAK, 2017).

The Architectural Association of Kenya was established in 1967 and brings together professionals in the construction industry in Kenya, including Architects, Quantity Surveyors, Town Planners, and Engineers among others. AAK links professionals and construction industry stakeholders: policy makers, manufacturers, real estate developers, financial institutions among others (CAK, 2017). The AAK registers qualified members, regulates the practice, and disciplines wayward professionals (CAK, 2017).

The Institute of Quantity Surveyors of Kenya (IQSK) was established in 1994. IQSK is an entity whose specific mandate is to promote and protect the interests of Quantity Surveyors in Kenya. The primary objective of IQSK is to support the overall development of Quantity Surveying and how it is applied in Kenya (IQSK, 2023).

Stakeholders in the building construction play a role in regulating and ensuring success of the building projects include Public Health Officers, Sub County Planners, Chief Officers, Environmental Impact Assessment (EIA) Experts, and National Environment Management Authority (NEMA) Officers. Other are National Construction Authority (NCA) Officers, Developers, Engineers, Architects, Site Supervisors, and Contractors.

A study conducted by Kuta and Nyaanga (2014), discovered that many contractors undertaking building construction in Nairobi, do not possess any professional qualifications in the related technical fields. The study also found that quality of construction project was influenced by the competence and qualifications of contractors. Omollo (2019) when investigated the barriers to the effective regulation of the building construction industry, revealed that building professionals contributed to building failures through accepting bribery, using unprofessional practices, and failing to comply with building regulations and standards. Khaemba (2013), in a study discovered that because there are no clearly defined policies, as well as, effective policies and regulations to guide the country's construction sector, many construction

projects and technical processes are undertaken by “quacks”. This usually leads to poor workmanship and unsafe buildings (Khaemba, 2013).

The National Construction Authority (NCA) was founded in 2011, with the mandate of ensuring that only qualified contractors are permitted to carry out construction work (World Bank Group, 2019). The NCA is a legal entity responsible for regulating the construction industry in Kenya. Its primary role is to oversee the construction industry with intention to make it better and vibrant. The NCA also has the responsibility to establish standards, techniques, and materials for construction. The entity also formulates and monitors the programs developed to train, in order to produce skilled construction worker and the supervisors for the construction industry. Finally, NCA is authorized to offer accreditation to the construction workers and ensure that only registered and competent contractors are permitted to handle building construction work. The NCA also ensures that contractors handle their work professionally and according to the code of conduct for the contractors operating in Kenya (NCA, 2023).

NCA was established to deal with unprofessional contractors operating in the construction industry and those who do not adhere to the building regulation in the construction sector as a whole (National Construction Authority, 2023). To attain its mandate, the NCA has categorized construction companies based on the contract cost they are permitted to handle, as well as the academic qualifications of proprietors of the building construction firms (NCA, 2023).

Environmental Management and Co-ordination ACT (EMCA) Chapter 387, the National Environment Management Authority (NEMA) was founded under the EMCA (1999) according to the Kenyan laws. The work of NEMA is to supervise and co-ordinate all matters pertaining to the environment, implements policies related to environment, and has the responsibility of protecting the environment using various mechanisms (Republic of Kenya, 2012). Protection of the environment, is supported other entities, including the civil society, environment consultancy firms, as well as, county and national government (Republic of Kenya, 2012). The National Building Inspectorate (NIB) has the responsibility to ensure that buildings conform to land registration, planning, building standards, structural soundness (NBI, 2018).

County governments Kenya were created under chapter 11 of the 2010 constitution of Kenya (CAK, 2017). Devolution through the County Government Act (2011), has mandated counties to be in charge of urban development, plan land use, and oversee the building code within their respective county boundaries (World Bank Group, 2019). Their role in the construction industry include passing laws and issuing regulations concerning health, safety, environmental matter among other issues. The County Government of Murang'a as other counties of Kenya, is in charge of land survey, land mapping, as well as county public works and drainage in urban centers. The county government has responsibility to approve architectural and structural drawings for building construction projects before the developer is permitted to build (County Government of Muranga, 2019). The County Government has the responsibility of providing basic social and physical structures services including education, water and sewerage, health, the collection of wastes etc. (County Government of Muranga, 2019).

#### **2.2.4 Model of the Impacts of Regulatory Practices on Performance of Building Construction Projects in Murang'a County**

In the building construction industry, being unable to prevent wastage and defects contribute significantly to cost of poor quality (COPQ) in the industry. It has been realized COPQ is hidden and consumes up to 40% revenues of the building construction company (Waje & Patil, 2017). In Kenya, building construction projects in most cases do not go according to the implementation plan (Mbaluka & Bwisa, 2013); they meet a lot of challenges in terms of quality assurance, cost, schedule, safety, and environmental performance (Githenya & Ngugi, 2014); and despite well trained consultants and regulation framework for the construction industry, the projects do not attain major performance goals (Lavy, 2011).

Neely *et al.*, (1995) proposed that performance should be defined as the efficiency and effectiveness of action. Efficiency is described as ability to deliver construction projects within the prescribed standards, which include adherence to time schedule, budget, specialized detail, and so on (Baker & Reid, 2005). Effectiveness is the ability to perform as expected (Baker & Reid, 2005). Performance of the building construction industry is influenced by regulations affecting every aspect of the sector

(Auma, 2014). The regulations that individuals and construction firms have to comply with, include environmental regulations, professional regulation practices, wellbeing and security regulations, permits, assessment, and protection laws (Muiruri & Were, 2016).

Xiao and Proverbs (2003), contend that the general performance of construction projects involve assessment of its final products; such as quality of the project, total cost of the project, project time/duration, its sustainability, profitability, as well as competitiveness. Of the same opinion is Vukomanovic *et al.*, (2010), who describes construction project performance in terms of timeliness, cost, quality, and health & safety.

According to Parfitt and Sanvido (1993) construction project quality is described as all the features in a project that enables it to satisfy a particular need or fitness for purpose. Freeman and Beale (1992), suggests that quality is met when a product meets the technical specifications. Mwangi (2016), views building construction time in absolute time; which is the number of days/weeks from the time the project is started to the time it is completed. Bubshait and Almohawis (1994), defines cost as what the project incurs from inception to completion. It includes the cost of variations, modifications, as well as legal claims, for instance litigation and arbitration. They also describe 'Health & safety' as the extent to which the project is completed without significant accidents or injuries (Bubshait & Almohawis, 1994). The purpose of measuring the performance of a building construction project is basically to determine to what extent it has succeeded or failed in relation to achieving its purpose.

The contribution by professional regulatory bodies to performance of building construction industry also needs to be investigated. According to Nyakiongora (2015), in many cases of collapsed buildings, either the opinion of qualified technical personnel in construction industry was not sought, or opinions given were never complied with. In other cases, they gave early warnings which were neglected with construction proceeding without following the correct procedures (Lidonga, 2015). Similar findings are observed in the study by Wambua and Otieno (2018) that revealed that the major causes of collapse of buildings in Kenya were mainly due to



noncompliance to housing policy, followed by low quality building materials and poor workmanship.

In Kenya's urban areas, there is high demand in housing, which has led to increase of poorly constructed buildings to help narrow the housing shortage. The buildings are constructed without complying with the required standards therefore buildings easily fall under minimal pressure (Wambua & Otieno, 2018).

## **2.3 The Critique of the Existing Literature Relevant to the Study**

### **2.3.1 The Existing Approval Processes in Building Construction Projects in Murang'a County.**

A study conducted in Cameroon by Tene *et al.*, (2017), revealed that increased collapse of buildings was because of poor inspection and monitoring, structural defects, defective design/structure, illegal conversion and alterations and, most importantly, non-adherence to existing building regulations and laws. The study used a mixed study method using desk review, interviews, and survey. The questionnaires were administered to 30 building practitioners, 20 staff drawn from the central or local authorities, 25 building operators or occupiers and 25 building owners.

Kuta and Nyaaga (2014) conducted a study to assess the influence of competence and qualifications on construction of substandard building in Kenya. The study was descriptive and targeted a population comprising of contractors within Nairobi Metropolitan. The study revealed that contracts were given to contractors who lack competence and qualifications in building construction. Engineers working on projects were not registered with the relevant professional authorities. Competence and qualification were found to be significantly correlated with quality of standard buildings. The gaps identified in the study were conceptual as it focused on competence and qualifications of contractors and contextual since it only focused on contractors within Nairobi Metropolitan. This study filled the gaps by expanding the scope by examining the effect of regulatory framework on performance of building construction projects in Murang'a County, Kenya.

Ochieng (2018) assessed the critical factors affecting performance of building construction projects in Kitengela, Kajiado County. The study was descriptive and used random sampling method, and correlation and regression analyses. The findings revealed a significant relationship between project managers' experiences, government regulations. The gaps identified in the study were contextual, conceptual, and methodological gaps. The study attempted to fill the gaps by widening the scope to include more stakeholders and focusing on regulatory practices at national and county, and also using a bigger sample of the population.

A study conducted by Wamuyu and Rukwaro (2020) on the challenges of acquiring statutory building approvals and interventions, used a small sample of 30 developers. The small sample of 30 respondents may have not been representative. Besides, using a small sample makes the findings not fit for generalization. Therefore, the gaps identified were conceptual and methodological.

### **2.3.2 Professional, National, and County Regulatory Practices on Performance of Building Construction Projects in Murang'a County.**

A study by Osei-Asibey *et al.*, (2021) to explore the extent to which stakeholders' complied with existing laws and regulations associated with construction health and safety (CHS) within the Ghanaian construction industry (GCI). The study was qualitative research approach and collected data using semi-structured interview guide. The interviews were face-to-face in-depth interview, targeting individuals concerned with ensuring health and safety at the construction sites, together with officers and professionals who are the main stakeholders in the GCI. The study was pegged on the grounded theory approach. The study adopted content analysis to analyze qualitative data. The study identified key laws and regulations including customary laws, bye laws, and Local Governance Act, 2016 (Act 936), as well as contract documents that the stakeholders comply with. The study also discovered that some construction health and safety related regulations which attracted low compliance rate. They include Factories, Shops and Offices Act, 1974 (Act 323), and Environmental Protection Act, 1994 (Act 490).

Gacheru and Diang'a (2015) conducted a study to investigate the challenges faced by the NCA in regulating building contractors in Kenya. The study was confined to one regulator and used a small sample of 61 building contractors drawn from Mombasa County. The sample was not representative of other regulatory bodies and only targeted building contractors from Mombasa County. The study gaps were therefore conceptual, contextual, and methodological. The current study sought to fill the gaps by widening the scope to include more stakeholders such as Sub County Planners, Chief Officers, EIA experts, Developers, Engineers, Site Supervisors etc., as this has provided more insight in to the study. The current study also used more regulatory institutions and a bigger sample of the population.

Omollo (2019) conducted a study to investigate major barriers to the effective regulation of the building construction industry in Kisii Town, Kenya. The study population was 84 contractors registered by NCA in Kisii town from which a sample of 64 was picked for the study. Semi-structured questionnaire was to gather data. Data analyses were both descriptive and inferential statistics comprising of Exploratory Factor Analysis (EFA), Pearson's bivariate correlation coefficient, and Confirmatory Factor Analysis (CFA). The study was only restricted to NCA and only targeted a population of registered building contractors. The gaps identified in the study were conceptual and contextual. The current study attempted to fill the gaps by widening the conceptual and contextual scope by examining the effect of regulatory framework on performance of building construction projects in Murang'a County, Kenya.

A study by Gichamba and Kithinji (2019) assessed the influence of environmental regulations on performance of construction projects in Nairobi County, revealed that influence of waste management regulation on performance of construction projects was significant, whereas the influence of noise and vibration regulations was of little significance, but physical planning regulation had insignificant influence on performance of construction projects in Nairobi County. The study adopted correlational research method on a sample of 269 registered construction firms located in Nairobi County. The study only considered the environmental regulations on performance of construction projects. This study filled the gap by encompassing more

conceptual variables to articulate how regulatory authorities at professional, national, and county levels affects the performance of building construction projects.

### **2.3.3 Model of the Impact of Regulatory Practices on Performance of Building Construction Projects in Murang'a County.**

A study by Oyewobi., (2011) investigated the determinants of unethical performance in Nigerian construction industry. Data was collected using self-administered questionnaire. The results show that corruption in the construction industry led to below standard construction and even abandonment of the projects. Also that corruption permitted all stages of construction including planning stage, tender stage, up to the last stage of completion. Data were analyzed using non parametric statistics since the data were ordinal in nature. To deal with corruption, the study made the following recommendations: Introduce legislation to deal with corruption; reinforcement of professional institutions to check errant members; and strengthening anti-corruption agencies. The study only focused on unethical behaviour, especially corruption. The study will fill the conceptual gap by examining how the regulatory framework affects performance of building construction projects.

A study conducted in Swaziland by Mashwama *et al.*, (2017), assessed the critical success factors that minimize poor quality in construction projects as perceived by construction professionals in the Swaziland construction industry. The research was quantitative and sampled 50 respondents from different construction companies. Data was gathered using questionnaire. Random sampling method was used to select the respondents in various construction companies. The study revealed that the cost of poor quality affects the construction industry of Swaziland. Another problem is underpricing of the construction project. Study conceptual framework was narrow as the study only focused on the perceptions of professional and cost of poor quality. The current study widened the conceptual scope by studying the impact of professional, national and county government regulatory practices on performance of building construction projects.

A study by Bucha *et al.*, (2020) found that legal framework meant to mitigate building failures in Kenya were obsolete, while others were duplications, therefore making

them ineffective. The study was descriptive and used a sample of 275 participants drawn from 11 counties with the worst cases of collapsed buildings. Conceptual gap was identified since the study was limited to legal framework, but the current study widened the scope to include more regulatory frameworks.

#### **2.4 Literature Review Summary and Research Gap**

Literature reviewed has demonstrated that despite developing regulatory framework to guide the building construction industry, there are still increased case of collapsed building projects (EBK, 2021). Studies by (Auma, 2014; Doloji *et al.*, 2017; Bucha *et al.*, 2020) attribute this to weak regular framework or noncompliance with the regulatory practices. Existing regulatory practices have been found to have many challenges. The challenges include; need for multiple permits and legislation from various institutions, long waiting period in acquiring approval, improbability in approval time, corruption, and high costs involved in approval process (Wamuyu & Rukwaro, 2020). Also the process of approval takes long and permits charges are high (World Bank, 2015).

Successful performance of building construction projects depends on the effective contribution of various professionals (Corbett, 2015). The professionals include architects, engineers, land surveyors, quantity surveyors, and environmental experts among others, are regulated by authorities like BORAQS, AAK, IQSK, and EBK (Nasila & Cloete, 2018). Despite that, it was discovered that many contractors undertaking building construction lack professional qualifications in the related technical fields (Kuta & Nyaaga, 2014). Barriers to effective regulation of the building construction industry by building professionals is attributed to unethical practices through accepting bribery, using unprofessional practice, and failing to comply with building regulations/standards (Omollo, 2019). National regulatory bodies such as NCA, have failed to mitigate the problem of collapsing buildings due to corruption, ineffective sensitization, poor organization of training programs offered by NCA, as well as, centralization the services offered by NCA (Gacheru & Diang'a, 2015).

Finally, the study is in line with the Public Interest Theory since the regulatory framework comprising of existing approval processes, professional regulatory

practices, national regulatory practices and County Government regulatory practices, that are meant to regulate the building construction industry, to safeguard public interest.

Although studies have been conducted on regulatory framework and building construction in Kenya, for example, the studies of (Gacheru & Diang'a, 2015; Gichamba & Kithinji, 2019; Wamuyu & Rukwaro, 2020), such studies have not been conducted in the context of Murang'a County. Besides, the reviewed studies, have exhibited conceptual, contextual and methodological gaps. Contextual gap was identified in the study of (Gacheru & Diang'a, 2015), as it was limited to one regulator, NCA and only targeted building contractors, and whose findings could not be applied to other regulators such as county and NEMA. Also the study by Gichamba and Kithinji (2019) that only considered the environmental regulations and firms in Nairobi. Methodological gap was found in the study by (Wamuyu & Rukwaro, 2020), conducted with a small sample of 30 developers only.

## **2.5 Conceptual Framework**

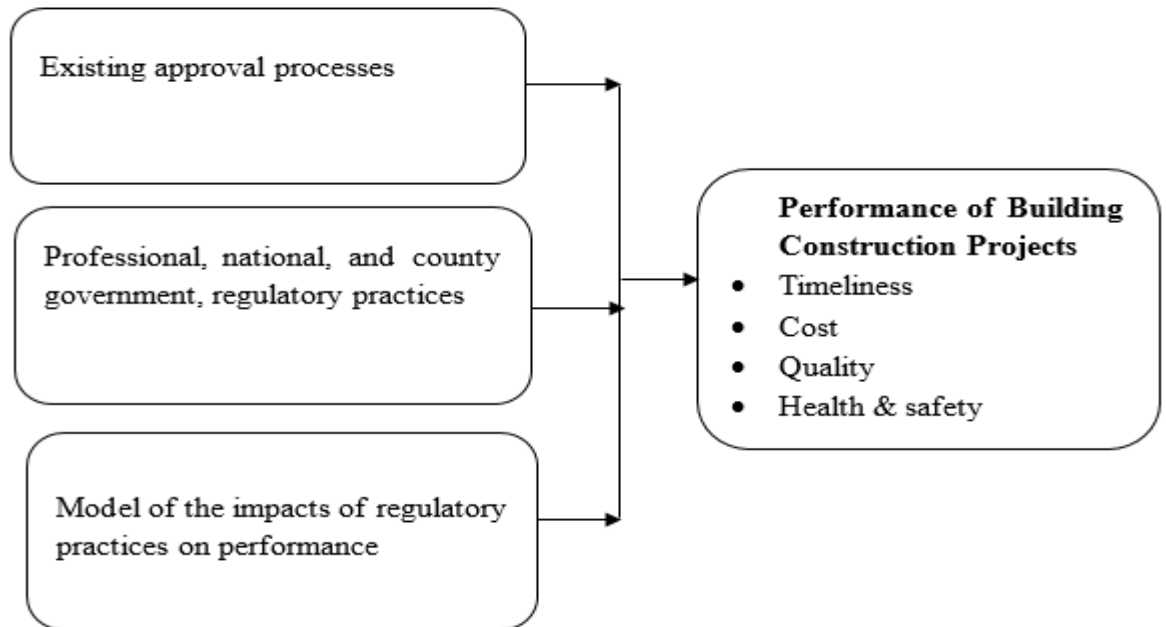
Figure 2.1 presents a description of the conceptual framework illustrating that the regulatory framework, which is the independent variable, affect performance of building construction projects, which is the dependent variable. In the current study, regulatory framework comprises of existing approval processes, professional regulatory practices, national regulatory practices, and County Government regulatory practice. Performance of building construction projects are depicted in the following constructs; timeliness, cost, quality, and health and safety of the project, as proposed by (Vukomanovic *et al.*, 2010).

**Conceptual framework**

**Independent variable**

**Dependent variable**

**Regulatory framework**



**Figure 2.1: Conceptual Framework of the Relationship between Regulatory Framework and Performance of Building Construction Projects**

## CHAPTER THREE

### MATERIALS AND METHODS

#### 3.1 Introduction

This chapter highlighted the research design, target population, sampling and sampling techniques, data collection instruments, data collection procedure, data processing and analysis, and ethical considerations.

#### 3.2 Research Design

The study adopted a descriptive survey research design. The descriptive survey design was considered appropriate for this study it was able to answer the “*how*”, “*what*” and “*to what extent*” questions as contained in the data collection instruments (Creswell & Creswell, 2018:28). The choice of the research design is also supported by Saunders *et al.*, (2019) who confirms that the kind of questions stated above requires descriptive, correlation and regression analyses which the study adopted. The descriptive survey research design was therefore suitable for the study as it responded to the RQ1. “*What are the existing approval processes in building construction projects in Murang’a County?*” RQ2. “*How do professional, national, and county regulatory practices affect the performance of building construction projects in Murang’a County?*” RQ3. “*How do the regulatory practices impact performance of building construction projects in Murang’a County?*”

To answer the questions stated above, questionnaire, interviews, site observations, and Focus Group Discussions (FGDs) were found to be appropriate. Data analysis techniques adopted were descriptive and inferential data analyses.

#### 3.3 Target Population

The targeted population comprised 260 professionals, supervisors, and contractors involved in the building construction industry in Murang’a County. They included 10 Public Health Officers, 10 Sub county Planners, 7 Chief Officers, 22 EIA experts, 14 NEMA Officers, 14 NCA Officers, 40 Developers, 28 Engineers, 28 Architects, 43



Site Supervisors, 44 Contractors. They were drawn from the seven sub counties of Murang'a County, namely; Gatanga, Kandara, Kiharu, Kangema, Mathioya, Kigumo and Maragwa. They were chosen because they possess knowledge and expertise on matters pertaining to planning, supervision, implementation, and regulating practices of building construction projects. They are therefore knowledgeable on issues concerning regulatory framework and performance of building construction projects.

### 3.4 Sample Size and Sampling Techniques

#### 3.4.1 Sample Size

The size of the sample was determined using statistical formula suggested by Yamane (1967) as presented below.

$$n = \frac{N}{1+N(0.05^2)} = \frac{260}{1+260(0.05^2)} = 158 \dots\dots\dots\text{Equation 3.1}$$

Where,

n = Sample Size,

N= Population,

1= Constant, and

e=Error margin = 0.05

Proportion of sample size was arrived at *pro rata* i.e. percentage of proportion sample over total sample size. This ensured that the total sample was distributed proportionally to each category of the sample population as presented in table 3.1

**Table 3.1: Distribution of the Target Population and Sample Size**

<b>Target Category</b>	<b>Population</b>	<b>Sample size (N)</b>	<b>Sample size (%)</b>
Public Health Officers	10	6	4
Sub county Planners	10	6	4
Chief Officers	7	4	3
EIA Experts	22	13	8
NEMA Officers	14	9	6
NCA Officers	14	9	6
Developers	40	24	15
Engineers	28	17	11
Architects	28	17	11
Site Supervisors	43	26	16
Contractors	44	27	17
<b>TOTAL</b>	<b>260</b>	<b>158</b>	<b>100</b>

### **3.4.2 Sampling Technique**

Sampling technique describes how a researcher selects members of a sample who participates in the research study (Cooper & Schindler, 2014). Procedure of selecting members of a sample can be either by probability or non-probability procedures. The study used probability sampling techniques involving cluster sampling, proportionate sampling, and purposive sampling (Cooper & Schindler, 2014). The sample was selected using three-step sampling process as guided by (Cooper & Schindler, 2014). First cluster sampling technique was used to include all categories of the population into the sample; second, proportionate sampling technique was used to ensure that the sample size was proportionately spread among the categories to reflect the distribution in the population; and third, purposive sampling technique was then used to pick individuals in charge of different processes according to the study objectives (Shi, 2015). Purposive sampling also ensured that only participants with the required information were included in the study (Mugenda & Mugenda, 2004).

### **3.5 Data Collection Instruments**

Self-administered questionnaire was used to collect data.

### **3.5.1 Questionnaire**

Self-administered questionnaire was chosen because it can administer standard questions to a big number of participants, within a short time, and at a low cost (Mugenda & Mugenda, 2004). The questionnaire was designed into five sections. Section A handled the respondents' demographic information, such as age, gender, work experience, and highest education level. Section B-F handled questions concerning the research objectives. Section B handled the first objective that focused on existing approval processes; Section C handled the second objective which focused on professional, national, county government regulatory practices; and lastly Section D which handled objective third objective that is to model the impacts of regulatory practices on performance of building construction projects in Murang'a County. The questionnaire required the respondents to answer in a Likert scale ranging from 1= Strongly disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=Strongly agree (Appendix II). As recommended by Bryman and Bell (2015) the questionnaire was subjected to validity and reliability tests to ensure suitability to collect the right information

#### **3.5.1.1 Questionnaire Piloting**

Pilot study was carried out in the month of September, 2023, to test reliability and validity of the questionnaire data. The validity of a data collection instrument is measured by the ability of the tool to measure the right data and to give true and accurate results (Bryman & Bell, 2015). For the pilot test, this study used 20 participants which is more than the 10% (16) of the sample size that is recommended by (Connelly, 2008). It also lies within 10-30 participants in the survey as suggested by (Isaac & Michael, 1999). The participants comprised of Public Health Officers 2, Sub county Planners 2, Chief Officers 2, EIA Experts 2, NEMA Officers 2, NCA Officers 2, Engineers 2, Architects 2, Site Supervisors 2, Contractors 2 drawn from Kiambu County. The participants and the results from piloting the questionnaire, however, were not part of the final research to avoid compromising the study findings.

### 3.5.1.2 Validation of Questionnaire

Validity test was applied to the questionnaire to determine whether it can measure what it is designed to measure (Thompson, 2004). The opinion of experts was sought to test face validity. Construct validity was ensured through expert knowledge of the supervisors and the researcher's mastery of the constructs in the study (Kothari, 2012). Validation of questionnaire was done in September, 2022.

### 3.5.1.3 Reliability of questionnaire

External consistency was tested by way of the test-retest method. It involved administering the questionnaire to similar group of participants in an interval of two weeks. Table 3.2 present the findings of reliability statistics of the study, indicating that the reliability test of all the models presented had satisfactory Cronbach's alpha values. Garson (2013) recommends Cronbach's Alpha of between 0.70 and 0.95. The study adopted cut off point of 0.70.

**Table 3.2: Reliability Test**

<b>Model</b>	<b>Cronbach's Alpha</b>	<b>Items</b>	<b>Interpretation</b>
Existing approval process	0.735	8	Good
Professional regulatory practice	0.674	6	Good
National regulatory practice	0.718	10	Good
County Government regulatory practice	0.804	7	Good
<b>Overall mean</b>	<b>0.733</b>		<b>Good</b>

Source: Data from pilot study

### 3.5.2 Interviews Schedule

Interviews were conducted to both describe and explain the existing approval processes in building construction projects in Murang'a County, and how professional, national, and county regulatory practices affects performance of building construction projects in Murang'a County. A total of 24 semi-formal interviews were conducted with key informants in their offices and at the building construction sites,

to get their opinion and insight, of how regulatory practices impact performance of building construction projects in Murang'a County. Those who participated in the study included 2 executives from NEMA, 2 executives from NCA, 4 officials for MCA, 4 contractors, and two each from the following professional bodies BORAQS, AAK, IQSK, and ERB. Semi-structured interviews enabled the study to explore the phenomena in the study from the perspective of the individuals (Borg & Gall, 1989; Feilzer, 2010); focusing on regulatory framework of building construction projects in Kenya. The interviews were taped and some notes taken for later reference. The interviews were guided by the interview schedule (Appendix III) and each interview lasted 25 minutes on the average.

### **3.5.3 Site Observation**

Site observations, involving site visits and taking records of what was happening on the ground, assisted in gathering significant information through observations. Through observations it was also possible to corroborate the facts that were gathered through interviews and questionnaires. Site observations enabled the researcher to answer questions and corroborate information pertaining to the existing approval processes, as well as for building construction projects in Murang'a County.

### **3.5.4 Focus Group Discussion**

The study conducted a focus group discussion to seek the opinion of the participants about regulatory framework of building construction in Murang'a County. The 8 participants included a Public Health Officer, Sub County Planner, NEMA officer, NCA officer, Contractor, Engineer, Architect, and a Site Supervisor. The related issues discussed included; weakness in the current regulatory framework, performance of the building construction in Murang'a County, focusing on timeliness, cost, quality, as well as health & safety. They also gave suggestions on how to improve the regulatory framework for better performance. This has helped the study to achieve objective 3 which is to model the impacts of regulatory practices on performance of building construction projects in Murang'a County.

### **3.6 Data collection Procedure**

Two research assistants who possessed degree in business course were used to administer the questionnaire. The research assistants were trained on the content of the research instruments and techniques of handling respondents when administering the questionnaires. The respondents were given one week to fill questionnaires. In cases where they had not done so in the first week, they were given one more week in order to provide a completed questionnaire. The approach enabled this study to get a very good response. Drop and pick process was used in administering the questionnaire (Mugenda & Mugenda, 2004).

In order to assess the existing approval processes in building construction projects in Murang'a County and to investigate the effect of professional, national, and county regulatory practices on performance of building construction projects in Murang'a County. Respondents indicated on a Likert scale ranging from strongly disagree to strongly agree; how much they agreed/disagreed with the statements related to the existing approval process; and effects of professional, national, and county regulatory practices on performance of building construction projects in Murang'a County. The respondents also rated to what extent the existing approval process affected performance of building construction projects in Murang'a County; and effect of professional, national, and county regulatory practices on performance of building construction projects in Murang'a County; based on a Likert scale ranging from to no extent to a very great extent (Refer questionnaire Appendix II). Data gathered from questionnaire was used to model the impacts of regulatory practices on performance of building construction projects in Murang'a County.

Interview schedule was used to guide the interview with key informants to investigate the effect of professional, national, and county regulatory practices on performance of building construction projects in Murang'a County (Refer to APPENDIX III: Interview schedule for key informants).

The FGD was held with 8 participants including a Public Health Officer, Sub County Planner, NEMA officer, NCA officer, Contractor, Engineer, Architect, and a Site Supervisor. From the discussion qualitative data was gathered in relation to how long

it takes to supervise an ongoing building construction project within its time of execution, what causes buildings to collapse in Murang'a County, and discussion of the performance of the building construction in Murang'a County, focusing on timeliness, cost, quality, as well as health & safety. They also gave their opinion on how the regulatory framework can be improved for better performance and service delivery in the building construction in Murang'a County.

### **3.7 Data Processing and Analysis**

After collecting data, it was edited, classified according to demographic variables and study objectives, tabulated for simplicity of analysis, and then analyzed (Ott & Longnecker, 2015). The methods of analyzing data involved descriptive and inferential statistics by using Statistical Package for Social Sciences (SPSS) version 24.

#### **3.7.1 Descriptive Statistics**

Descriptive statistics was used to analyze data involving frequency, percent, mean, and standard deviation, which were then presented in tables and graphs. Descriptive statistics was used to describe and present data for simpler and meaningful interpretation (Malhotra, 2010). Descriptive statistics enabled the researcher to assess the existing approval processes in building construction projects in Murang'a County, and to investigate the effect of professional, national, and county regulatory practices on performance of building construction projects in Murang'a County

#### **3.7.2 Inferential Statistics**

Inferential statistics were based on correlation and multiple linear regression analysis. Regression analyses enabled the study to model the impacts of regulatory practices on performance of building construction projects in Murang'a County. The *t* test was used to establish the statistical significance of the predictor variables, while ANOVA *F* statistic confirmed the fitness of the regression model (O'Brien & Sharkey, 2012). Pearson's Product Moment Correlation (*r*) was used to reveal the strength of the

relationships (O'Brien & Sharkey, 2012). SPSS version 23 was used to aid in statistical analyses.

### 3.7.3 Multiple Regression model

Regression analysis was used as a statistical method to show the relationship between the regulatory practices and performance of building construction projects. It adopted the equation below;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \dots\dots\dots \text{(Equation 3.2)}$$

Where:

Y = Performance of building construction projects

$\beta_0$  = constant term

$\beta_1, \beta_2, \beta_3$  and  $\beta_4$ , = Beta coefficients

$X_1$  = Existing approval processes

$X_2$  = Professional, national regulatory practices

$X_4$  = County Government regulatory practices

$\varepsilon$  = Error term

### 3.8 Ethical Considerations

According to Saunders *et al.*, (2019), it is the responsibility of a researcher not to cause harm to participants in a study by observing certain ethical issues. The ethical considerations were observed while conducting the study by seeking informed consent, maintaining confidentiality, ensuring anonymity, and honesty to participants (Mugenda & Mugenda, 2004; Nieswiadomy, 2007). Before conducting the study, the participants were informed that it was meant for academic purpose only. Throughout the research study, all the ethical issues as stated were fully complied with.



## **CHAPTER FOUR**

### **RESULTS AND DISCUSSIONS**

#### **4.1 Introduction**

The chapter presents the results of data analyses based on the research questions. Data analyses were both descriptive and inferential using SPSS version 24.

#### **4.2 Response Rate**

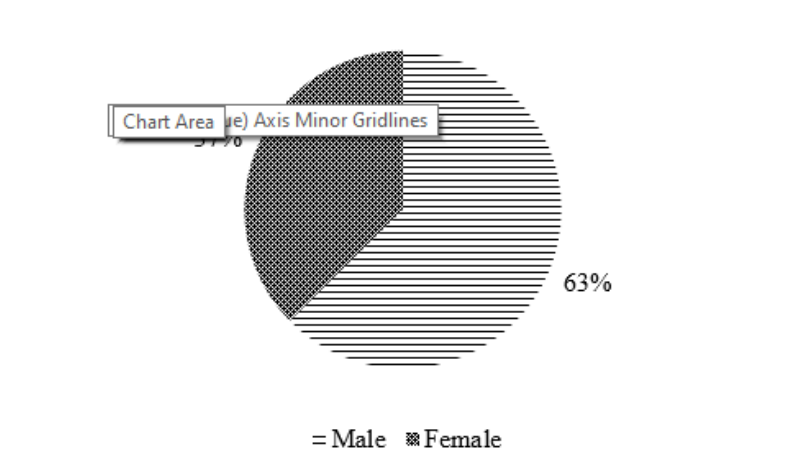
The questionnaires distributed were 158 and all were correctly completed and returned, yielding a response rate of 100%. The 100% response was achieved because the respondents were given enough time (two weeks) to complete the questionnaire. This study also conducted follow up that yielded good response.

#### **4.3 Demographic Information of the Participants in the Study**

The demographic information captured comprised of gender, age, and education level of participants.

##### **4.3.1 Gender of Participants**

As reported in Figure 4.1, gender distribution for participants was 63% male and 37% female. The findings indicated that there were more male than female who participated in the study. However, gender difference does not have any implication in the study results.



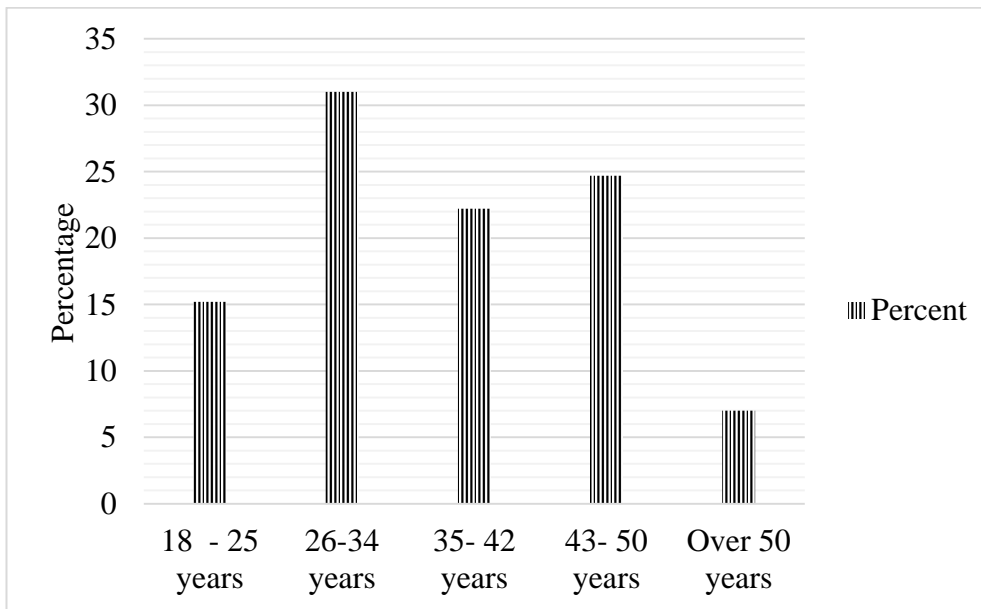
**Figure 4.1: Gender of Participants in the Study**

#### **4.3.2 Age Distribution of Respondents**

Figure 4.2 demonstrates that most of the respondents, 49 (31%) belonged to (26 - 34) age bracket, followed by 38 (24.1%) respondents between the ages 43 – 50 years, 33 (20.9%) respondents of age (35 – 42) years, 27 (17.1%) respondents were between the ages of (18 – 25) with up to 5 years' experience, and 11 (7%) respondents were above 50 years. Majority of the respondents had more than 5 years' experience, therefore enhancing data relevance and credibility.

#### **4.2 Age Distribution of the Participants in the Study**

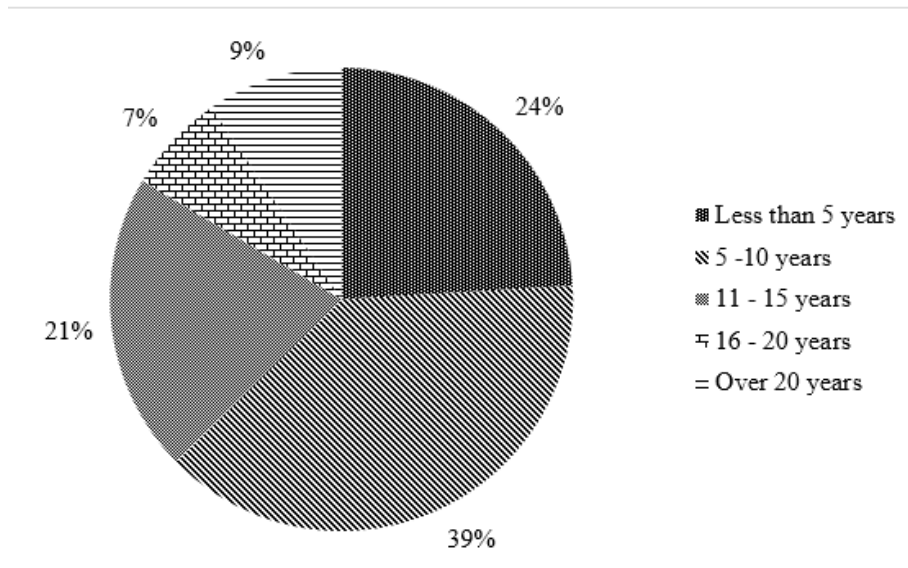
As shown in Figure 4.2 majority of the participants belonged to age group 26-34 years old (31%, n=49), followed by 35-42 age group (20.9%, n=33). The smallest group belonged to those over 50 years (7%, n=11). The findings indicate that most of the participants were in the most active age group.



**Figure 4.2: Age Distribution of the Participants**

### 4.3.3 Work Experience

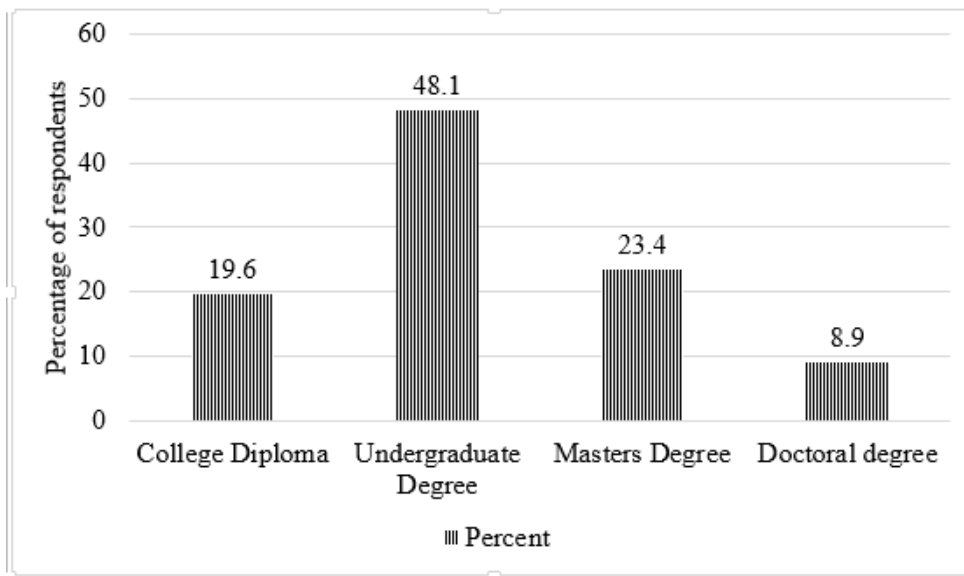
The study enquired from the respondents the duration that they had worked in the respective positions. As evident in Figure 4.3, 61 (39%) respondents had been engaged in the organization for between 5-10 years, 33(21%) had served in the organization for between 11-15 years, 15 (9%) had served in the organization for over twenty years, 11 (7%) had served for between 16-20 years, and 38 (24%) had served for less than five years. The findings indicate that most of the respondents had served for over 5 years and had the knowledge about the organizations' operations. Figure 4.3 below presents the findings.



**Figure 4.3: Work Experience of Participants in the Study**

#### **4.3.4 Highest Level of Education**

The study asked the respondents their academic levels. As evident in the Figure 4.4, 76 (48.1%) respondents were undergraduates, 37 (23.4%) of respondents had Master's degree, 31 (19.6%) had college diploma, and 14 (8.9%) had PhD. This shows that they possessed the necessary skills and knowledge to provide credible and reliable information. The findings indicated that undergraduates are more which conforms to the work experience that shows that slightly more than 50% of the respondents had worked for less than 10 years. The findings are presented in the Figure 4.3 below:



**Figure 4.4: Education Level of the Participants in the Study**

#### **4.4 The Existing Approval Processes in Building Construction Projects in Murang’a County**

The first objective of the study was to assess the existing approval processes in building construction projects in Murang’a County. Findings presented in Table 4.1 show how much the respondents agreed/disagreed with the following statements. Data was analyzed using mean and standard deviation statistics. The study results revealed that; a significant number of the respondents ( $M=4.00$ ) were of the opinion that the existing approval process is characterized by unethical practices, high charges of approval permits, inconsistencies in regulatory requirements and how inspections are conducted, and long waiting duration before approval of architectural and structural drawings. They also agreed that although the routine inspection of construction sites is undertaken by various regulatory authorities to ensure compliance, the multiple permits and legislation cause delay in getting building construction approval. However, they were undecided as to whether technology has allowed better tracking of the approval process ( $M=3.42$ ,  $SD=1.011$ ) and that existing approval process in the building industry is too demanding ( $M=2.09$ ,  $SD=1.021$ ). Table 4.1 displays the descriptive statistics on existing approval process for building construction projects.

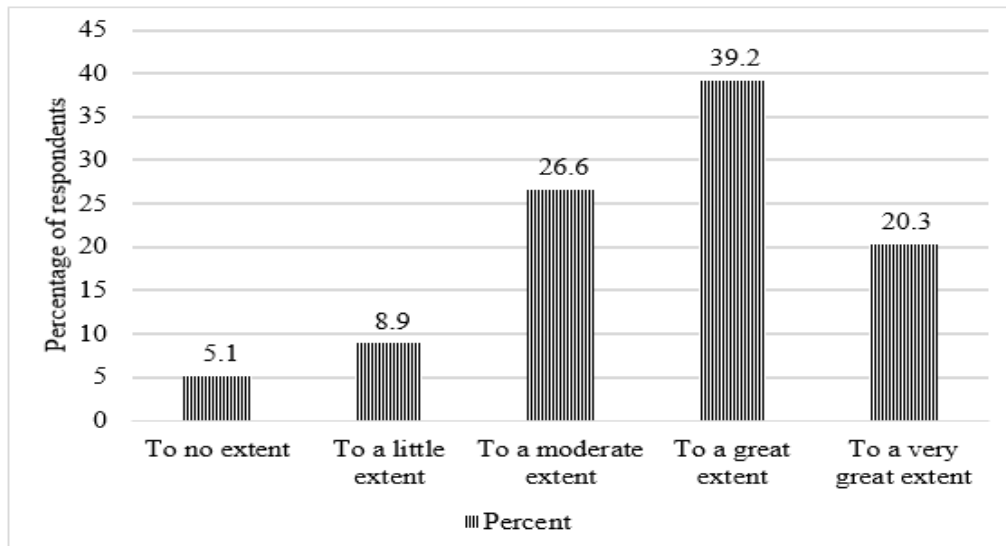
**Table 4.1: Existing Approval Process for Building Construction Projects**

<b>Description of existing approval process</b>	<b>N</b>	<b>M</b>	<b>SD</b>
Approval process is affected by unethical practices	158	3.94	.651
Routine inspection of construction sites is undertaken by regulatory authorities to ensure compliance	158	3.84	.895
There are inconsistencies in regulatory requirements and how inspections are conducted.	158	3.83	.890
Long waiting duration before approval of architectural and structural drawings	158	3.58	1.054
Approval permits charges are high	158	3.55	1.109
Multiple permits and legislation cause delay in getting building construction approval	158	3.51	.915
Technology has allowed better tracking of the approval process	158	3.42	1.011
Existing approval process in the building industry is too demanding	158	2.09	1.021

**Key: *N*=Number of respondents, *M*=Mean, *SD*=Standard deviation**

Figure 4.5 presents results on the extent to which existing approval process impact building construction projects in Murang'a County. The results indicated that almost 40% were of the opinion that existing approval process impacted the performance of the building construction projects to the majority of the respondents were of the opinion that existing approval process had impacted the construction buildings projects to a great extent, while only a small number (5%) indicated to a little extent.

Figure 4.5 presents the extent to which existing approval process impact building construction projects in Murang'a County.



**Figure 4.5: Extent to which Existing Approval Process Impact Building Construction Projects in Murang'a County**

From the findings it can be suggested that the existing approval process is characterized by a lot of weaknesses, unethical practices, high charges of approval, and delays, and these may be caused by number of regulatory authorities involved in checking compliance, as well as the requirement of multiple permits, which may be the cause of delay in getting building construction approval. The findings are consistent with that of Gacheru and Diang'a (2015) that cited corruption, ineffective sensitization, and centralization of the services as having negative impact on performance of the building construction projects.

#### **4.5 Professional, National, and County Regulatory Practices on Performance of Building Construction Projects in Murang'a County**

The second objective was to investigate the effect of professional, national, and county regulatory practices on performance of building construction projects in Murang'a County. The respondents indicated how much they agreed/disagreed with the statements concerning the professional regulatory practices on performance of building construction projects in Murang'a County. As presented in Table 4.2, the study findings indicate that there was adequate professional inspection of materials and process during construction ( $M=3.71$ ,  $SD=0.966$ ); Cases of compromising

professionals involved in building construction projects are high ( $M=3.51$ ,  $SD$  0.915); Professional regulatory bodies ensure that building constructions comply to all regulations in building construction ( $M=3.46$ ,  $SD=0.928$ ); AAK, IQSK, and EBK enhance ethical practices among the members ( $M=3.45$ ,  $SD=0.818$ ); IQSK safeguards observation of conditions and costs of building contracts ( $M=3.42$ ,  $SD=1.011$ ); Professional regulatory bodies give adequate training and licenses to their professionals ( $M=3.14$ ,  $SD=1.103$ ). Table 4.2 presents data on the description of professional regulatory practices on performance of building construction projects in Murang’a County.

**Table 4.2: Effect of Professional Regulatory Practices on Performance of Building Construction Projects in Murang’a County**

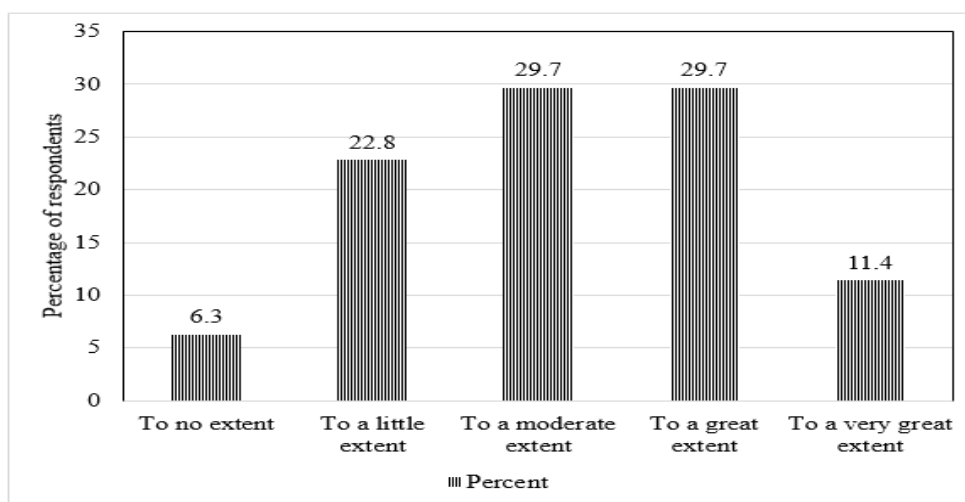
Description of professional regulatory practices	N	M	SD
There is adequate professional inspection of materials and process during construction	158	3.71	.966
Cases of compromising professionals involved in building construction projects are high	158	3.51	.915
Professional regulatory bodies ensure that building constructions comply with all regulations in building construction.	158	3.46	.928
AAK, IQSK, and EBK enhance ethical practices among the members	158	3.45	.818
IQSK safeguards observation of conditions and costs of building contracts	158	3.42	1.011
Professional regulatory bodies give adequate training and licenses to their professionals	158	3.14	1.103
<b>Overall mean</b>		3.45	0.957

**Key: N=Number of respondents, M=Mean, SD=Standard deviation**

Regarding the extent to which professional regulatory practices had impacted performance on building construction projects in Murang’a County. As indicated in Figure 4.6. Majority, 47 (29.7%) each were of the opinion that professional regulatory practices had impacted performance of building construction projects in Murang’a County, to great extent and to a moderate extent. They were followed by 36 (22.8%) who indicated to a little extent, and only 18 (11.4%) who indicated to a very great



extent. The mean score of 3.17 ( $SD=1.101$ ) show that majority of the respondents suggested that professional regulatory practices impacted on overall cost and timely completion of performance of building construction projects in Murang’a County, to a moderate extent.



**Figure 4.6: Extent to which Professional Regulatory Practices Impact Overall Cost and Timely Completion of Building Construction Projects in Murang’a County**

Interviews with professionals, including Consultants from BORAQS, AAK, IQSK, and EBK revealed that professional regulatory practices involved:

*Checking of all compliance items including; architectural plan, registered contractor, consultants, actual paperwork, signboard, hoarding, safety precautions, and general workmanship” (AAK, IQSK, and EBK officials)*

Interview question as to what was the average consultancy charges for inspection of ongoing project. The official from BORAQS, EBK, and the contractors also confirmed that the average consultancy charges for inspection of ongoing project in Murang’a County was Kenya shilling. 8,000 per floor.

Response to the question “How often do you inspect any ongoing project within your supervision?” They indicated that:

*“Inspection of ongoing building construction projects within my supervision is done periodically and is a continuous process during the whole period of the building construction”. (BORAQS official)*

The response to the interview question on “What is the average number of projects under your supervision?” they stated that the

*“Average number of projects under their supervision at any one time is dependent on various factors such as; project location but within the jurisdiction of the sub county officials to include physical planners, public health officers and works inspectors”. (Project Engineer)*

The Focus Group Discussions (FGDs) confirmed that it took an average of four times a month to supervise an ongoing building construction project within its time of execution. The FGDs also suggested that what causes buildings to collapse are; carelessness by the workers, alterations and adjustments without consultants’ input, structural defects, inadequate supervision, and using substandard materials, the same is confirmed by (Kazimoto, 2016).

The findings on the impact of national regulatory practices on performance of building construction projects in Murang’a County indicate that the NCA has enhanced the quality of work in construction projects ( $M=3.99$ ,  $SD=0.485$ ); National regulatory authorities effectively enforce their regulations ( $M=3.94$ ,  $SD=0.651$ ); Contractors only work with NCA accredited construction workers and site supervisors ( $M=3.84$ ,  $SD=0.895$ ); National regulatory authorities provide adequate sensitization on regulations to all the stakeholders ( $M=3.83$ ,  $SD=0.890$ ); NCA had reduced incompetent construction contractors ( $M=3.58$ ,  $SD=1.054$ ); NCA published code of conduct guides building construction projects in the county ( $M=3.51$ ,  $SD=0.929$ ); NEMA guidelines for conservation of natural resources are effective ( $M=3.49$ ,  $SD=0.908$ ); National regulatory authorities have put in place effective environmental policies to guide building construction projects ( $M=3.47$ ,  $SD=0.922$ ); National regulatory authority officials conduct regular onsite inspection of building construction projects ( $M=3.46$ ,  $SD=1.032$ ); and NEMA provides mitigation measures to deal with environmental issues associated with building construction ( $M=3.43$ ,

$SD=0.999$ ). The overall mean 3.65 ( $SD= 0.877$ ), suggests that most respondents agreed that national regulatory practices had affected the performance of building construction projects in Murang’a County.

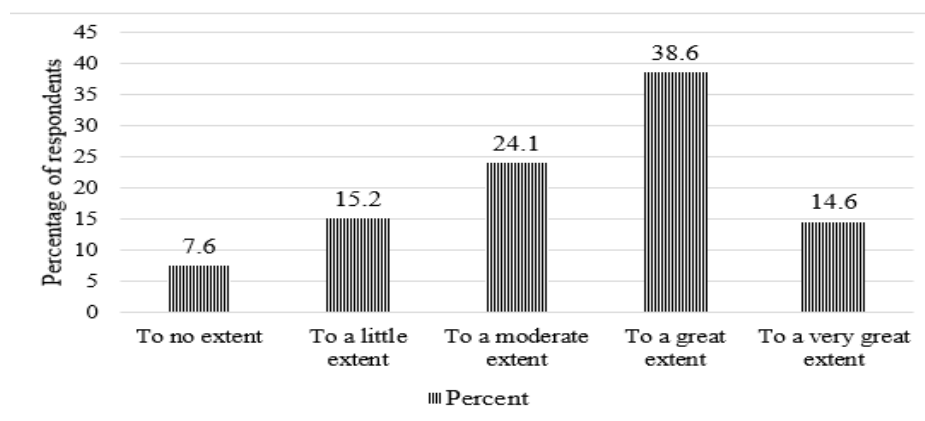
**Table 4.3: Effect of National Regulatory Practices on Performance of Building Construction Projects in Murang’a County**

<b>Description of national regulatory practices</b>	<b>N</b>	<b>M</b>	<b>SD</b>
NCA has enhanced the quality of work in construction projects	158	3.99	.485
National regulatory authorities effectively enforce their regulations	158	3.94	.651
Contractors only work with NCA accredited construction workers and site supervisors	158	3.84	.895
National regulatory authorities provide adequate sensitization on regulations to all the stakeholders	158	3.83	.890
NCA had reduced incompetent construction contractors	158	3.58	1.054
NCA published code of conduct guides building construction projects in the county	158	3.51	.929
NEMA guidelines for conservation of natural resources are effective	158	3.49	.908
National regulatory authorities have put in place effective environmental policies to guide building construction projects	158	3.47	.922
National regulatory authority officials conduct regular onsite inspection of building construction projects	158	3.46	1.032
NEMA provides mitigation measures to deal with environmental issues associated with building construction.	158	3.43	.999
<b>Overall mean</b>	<b>158</b>		

**Key: N=Number of respondents, M=Mean, SD=Standard deviation**

The respondents rated the extent to which national regulatory practices had impacted the health and safety of building construction projects in Murang’a County. The findings are as presented in Figure 4.7. Majority 61 (38.6%) of the respondents were of the opinion that the national regulatory practices had impacted health and safety of

building construction projects in Murang’a County, to a great extent; followed by 38 (24.1%) indicated to a very great extent, 24 (15.2%) indicated to a little extent, followed closely by 23 (14.6%) who indicated to a very great extent. Those who indicated to no extent were only 12 (7.6%) respondents. The mean of 3.37 ( $SD=1.137$ ) suggests that national regulatory practices had impacted health and safety of building construction projects in Murang’a County, to a moderate extent.



**Figure 4.7: Extent to which National Regulatory Practices Impacted Health and Safety of Building Construction Projects in Murang’a County**

Regarding the challenges associated with compliance with NEMA/NCA regulations in the building construction, one interviewee from NEMA cited manipulation in order to get certificate of compliance a major challenge. Another challenge mentioned by NCA official was the long list of requirements needed for project registration and the timelines of approval process for building construction projects. All the participants in the FGDs indicated that compliance to NEMA and NCA regulations is marred by corruption between the contractors and officials from NEMA and NCA. Corruption and construction costs have effect on cost, quality of buildings, and health & safety of the building construction projects, as supported by the study by (Wambua & Otieno, 2018).

Murang’a County Government officials conducts frequent site visits to ensure conformity ( $M=3.99$ ,  $SD=0.485$ ); Personnel attached to supervision of construction regulations at MCG are held responsible when they fail to perform their work responsibly ( $M=3.84$ ,  $SD=0.895$ ); MCG has adequate institution capacity to enforce

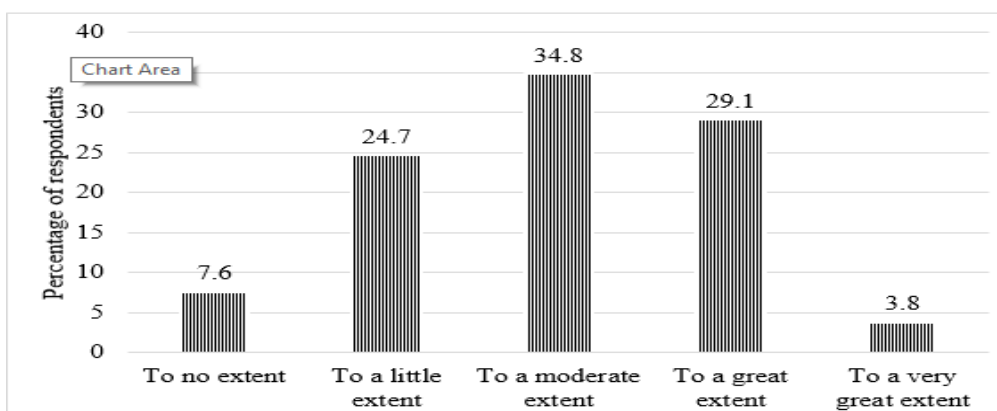
the building construction regulations ( $M=3.83$ ,  $SD=0.890$ ); MCG only issue permits and licenses to qualified contractors ( $M=3.58$ ,  $SD=1.054$ ); In MCG cases of unethical practices involving inspection of buildings during or after construction are high ( $M=3.49$ ,  $SD=1.057$ ); At MCG building and licensing department issues construction and occupation permits competently and on time ( $M=3.39$ ,  $SD=0.957$ ); MCG has ensured competent workmanship throughout the construction project ( $M=3.39$ ,  $SD=0.957$ ). Overall mean of 3.64 ( $SD=0.899$ ), suggests that most respondents were of the view that government regulatory practices affected the performance of building construction projects in the County. Table 4.4 shows the means and standard deviations statistics of county government regulatory practices.

**Table 4.4: Effect of Murang’a County Government Regulatory Practices on Performance of Building Construction Projects in Murang’a County**

<b>Description of County Government regulatory practices</b>	<b>N</b>	<b>M</b>	<b>SD</b>
MCG officials conducts frequent site visits to ensure conformity	158	3.99	.485
Personnel attached to supervision of construction regulations at MCG are held responsible when they fail to perform their work responsibly	158	3.84	.895
MCG has adequate institution capacity to enforce the building construction regulations	158	3.83	.890
MCG only issue permits and licenses to qualified contractors	158	3.58	1.054
In MCG cases of unethical practices involving inspection of buildings during or after construction are high	158	3.49	1.057
At MCG building and licensing department issues construction and occupation permits competently and on time	158	3.39	.957
MCG has ensured competent workmanship throughout the construction project	158	3.39	.957
<b>Overall mean</b>		<b>3.64</b>	<b>0.899</b>

**Key: N=Number of respondents, M=Mean, SD=Standard deviation**

The respondents also rated how MCG regulatory practices had influenced cost and duration of building construction projects in Murang'a County. As presented in Figure 4.8: majority 55 (34.8%) respondents indicated that NEMA regulatory practices influenced cost and quality of building construction projects in Murang'a County, to a moderate extent; they were closely followed by 46 (29.1%) who indicated to a great extent, 39 (24.7%) indicated to a little extent, and 6 (3.8%) who indicated to a very great extent. Those who felt that Government regulatory practices had no effect on building construction projects in Murang'a County, were 12 (7.6%) respondents. Mean of 2.97 ( $SD=0.999$ ), implies that county government regulatory practices had influenced cost and duration of building construction projects to a moderate extent. Figure 4.8 presents findings on the extent to which MCG regulatory practices influenced cost and quality of building construction projects in Murang'a County.



**Figure 4.8: Extent to which MCG Regulatory Practices Influenced Cost and Duration of Building Construction Projects**

The interviewees indicated that developers are required to incur Ksh. 150 per square meter as cost of approval. The cost therefore varies based on the building type and scope of the works. They further said that ongoing projects are subjected to periodic inspections during the project life. According to the MCG executive,

*“Monitoring is carried on a weekly basis by using an inspection sheet called green card to ensure quality and adherence to designs”.*

The interviewees also stated that it takes between 2-7 days for an application to be approved after submission of all the required documents. This however, depended on the coordination between the developer and the technical team. MCG officials indicated that prior to approval of the building construction project, a developer is required to submit approved drawings, Consultants' Certificates and their commitment letters, duly filled PPA 2 form, NEMA license, BoQ Summary page, Developer's KRA Pin, Contractor's practicing license and a signed contract agreement between the contractor and the developer.

The approval process involves professional and technical staff from the professional bodies (i.e. BORAQS, AAK, IQSK), national (NEMA, NCA), and county government (MCG officials). The rigorous approval process is to ensure that all the building construction projects adhere to cost, quality, health, safety, and environmental standards.

The interviewees cited the following as challenges they do face during their undertakings: Long list of approvals by different regulation authorities, completion schedule, poor coordination and poor communication among the stakeholders.

Responding on how they plan to improve service delivery, the interviewees and FGDs suggested the following: Awareness of Key Performance Indicators, having a centralized approval point for all relevant offices or departments, reduced turn around approval time and assigning a specific officer to undertake the periodic inspection.

The FGD revealed that building construction projects in Murang'a County experienced cost overrun, delayed completion period, and poor quality, which contributed to buildings collapsing, high maintenance costs, and buildings that are not functional, as supported by (Githenya & Ngugi, 2014).

The findings from the survey questionnaire, interviews and FGDs on the effect professional, national, and county regulatory practices on performance of building construction projects in Murang'a County, were consistent with (Kazimoto, 2016) assertion that building collapse are caused by carelessness by the workers, alterations and adjustments without consultants' input, structural defects, inadequate supervision,

and using substandard materials. These shortfalls can be associated with unethical practices, multiple requirement, costs involved in the approval process, as well as the actual construction costs, which consequently have effect on cost, quality of buildings, and health & safety of the building construction projects as supported by the study of (Wambua & Otieno, 2018). Githenya and Ngugi (2014) also support the FGDs that revealed that building construction projects in Murang'a County experienced cost overrun, delayed completion period, and poor quality that may be attributed to collapsed building and non-functional buildings.

Table 4.3 presents the descriptive statistics of national regulatory practices on performance of building construction projects in Murang'a County.

#### **4.6 Model of the Impact of Regulatory Practices on Performance of Building Construction Projects in Murang'a County**

The third objective was to model the impacts of regulatory practices on performance of building construction projects in Murang'a County. The findings of correlation and multi regression analysis are as shown below.

##### **4.6.1 Correlation Analysis**

Bivariate Pearson's correlation analysis was conducted to examine the relationship between regulatory framework and performance of building construction projects Table 4.5 presents the results as follows. Existing approval process and performance of building construction project had a positive significant linear relationship, [ $r(158) = .165^*$ ,  $p = 0.038$ ]; professional regulatory practices and performance of building construction projects had a positive significant linear relationship [ $r(158) = 0.268^{**}$ ,  $p = 0.001$ ]; there was a positive significant linear relationship between national regulatory practices and performance of building construction projects [ $r(158) = 0.593^{**}$ ,  $p = .000$ ].

Lastly, there was positive insignificant linear relationship between County Government regulatory practices and performance of building construction project [ $r(158) = 0.097$ ,  $p = 0.224$ ]. The insignificant linear relationship between can be



attributed corruption, ineffective sensitization of the contractors, poor organization of training programs offered by NCA, and, centralization of the services, as supported by the study by Gacheru and Diang'a (2015).

Table 4.5 presents correlation analysis between performance of building construction projects and the various determinant.

**Table 4.5: Correlation Analysis between Performances of Building Construction Projects and the Various Determinants**

		<b>Performance of building and construction project</b>	<b>Existing approval processes</b>	<b>Professional regulatory practices</b>	<b>National regulatory practices</b>	<b>County Government regulatory practices</b>
Performance of building construction projects	Pearson Correlation	1	.165*	.268**	.593**	.097
	Sig. (2-tailed)		.038	.001	.000	.224
	N	158	158	158	158	158
Existing approval processes	Pearson Correlation	.165*	1	.676**	.567**	.651**
	Sig. (2-tailed)	.038		.000	.000	.000
	N	158	158	158	158	158
Professional regulatory practices	Pearson Correlation	.268**	.676**	1	.377**	.432**
	Sig. (2-tailed)	.001	.000		.000	.000
	N	158	158	158	158	158
National regulatory practices	Pearson Correlation	.593**	.567**	.377**	1	.502**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	158	158	158	158	158
County government regulatory practices	Pearson Correlation	.097	.651**	.432**	.502**	1
	Sig. (2-tailed)	.224	.000	.000	.000	
	N	158	158	158	158	158

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\* . Correlation is significant at the 0.01 level (2-tailed).

#### 4.6.2 Multiple Regression Analysis

The multiple regression analysis sought to determine how existing approval processes, professional regulatory practices, national regulatory practices, and County Government regulatory practices impacted on building construction performance in Murang'a County.

#### 4.6.3 Regression Model of the Impact of Regulatory Framework on Performance of Building Construction Projects

Regression model was fitted to examine the impact of each independent variable on performance of building construction projects. The overall regression was found to be statistically significant as shown in Table 4.6; ( $R^2 = 0.462$ ,  $F(4, 153) = 32.895$ ,  $p = 0.000$ ). The ( $R^2$ ) value of 0.462, implying that the independent variables explained 46.2% of the changes in the level of performance of building construction projects, while 53.8% is explained by other factors not considered in the study. Table 4.6: show the regression model of the relationship between regulatory framework and performance of building construction projects in Murang'a County.

**Table 4.6: Regression Model of the Relationship between Regulatory Framework and Performance of Building Construction Projects in Murang'a County**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.680 <sup>a</sup>	.462	.448	2.013	1.914

a. Predictors: (Constant), County Government regulatory practices, Professional regulatory practices, National regulatory practices, Existing approval processes

b. Dependent Variable: Performance of building and construction project

#### 4.6.4 Analysis of Variance (ANOVA) of the Impact Of Regulatory Framework on Performance of Building Construction Projects

ANOVA reports how good the regression equation predicts the performance of building construction projects. As shown in Table 4.7, the ANOVA statistics indicate statistically positive significant effect of the predictors; existing approval processes, as well as

professional, national, and county government regulatory practices on performance of building construction projects at  $p < .05$ , [ $F(4, 153) = 32.895, p = .000$ ]. It means that the existing approval processes and professional, national, county government regulatory practices affect the performance of building construction projects in Murang'a Country. The findings are consistent with the study by Ochieng' (2018) that found that government regulations had significant relationship with performance of building projects. Table 4.7 presents ANOVA of the impact of regulatory framework on performance of building construction project.

**Table 4.7: ANOVA of the Impact of Regulatory Framework on Performance of Building Construction Project**

<b>Model</b>	<b>Sum of Squares</b>	<b>Df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
1 Regression	533.363	4	133.341	32.895	.000 <sup>b</sup>
Residual	620.182	153	4.053		
<b>Total</b>	<b>1153.544</b>	<b>157</b>			

a. Dependent Variable: Performance of building and construction project

b. Predictors: (Constant), County Government regulatory practices, Professional regulatory practices, National regulatory practices, Existing approval processes

#### **4.6.5 Coefficients of the Impact of Regulatory Framework on Performance of Building Construction Projects**

Table 4.8 indicates the regression coefficients for performance of building projects in Murang'a County. The findings demonstrate that regulatory framework is statistically significant in explaining the performance of building construction projects in Murang'a County. This is supported by  $p$  value = 0.000. Respectively, the variables revealed that the existing approval processes had negative significant effect on performance of building construction projects ( $\beta = -0.347, t = -3.458, p < 0.05$ ). The findings on existing approval processes are consistent with the findings Gacheru and Diang'a (2015), that revealed that corruption, ineffective sensitization, poor organization of training programs, as well as centralization the services have negative impact on performance of the building construction project

The professional regulatory practices had significant positive effect on performance of building construction projects ( $\beta = 0.294$ ,  $t = 3.659$ ,  $p = 0.000$ ). This is supported by the findings by Omollo (2019) which revealed that building professionals contributed to performance of building project performance through regulations/standards. It therefore implies that good or poor performance of building construction is determined by the way professional regulatory practices are complied with.

National regulatory practices had positive significant effect on performance of building construction projects ( $\beta = 0.776$ ,  $t = 10.534$ ,  $p = 0.000$ ). The results of the study conform to the findings by Gichamba and Kithinji (2019) that revealed that waste management regulation had significant influence on performance of construction projects.

County Government regulatory practices had a significant negative effect on performance of building construction projects in Murang'a County ( $\beta = -0.193$ ,  $t = -2.421$ ,  $p = 0.017$ ). The findings are supported by the study by Bucha *et al.*, (2020) that found that some of the legal frameworks meant to mitigate building failures in Kenya, are obsolete and some are duplications, therefore making them ineffective. The study findings are also consistent with the theory that the building construction industry is exposed to dangers of integrity and non-compliance (Gacheru & Diang'a, 2015), hence, it had to be regulated. Table 4.8 show the coefficients of the impact of regulatory framework and performance of building construction projects

**Table 4.8: Coefficients of the Impact of Regulatory Framework and Performance of Building Construction Projects**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-2.492	1.762		-1.415	.159
Existing approval processes	-.256	.074	-.347	-3.458	.001
Professional regulatory practices	.224	.061	.294	3.659	.000
National regulatory practices	.596	.057	.776	10.534	.000
County government regulatory practices	-.164	.068	-.193	-2.421	.017

From Table 4.9, the regression model can be written in an equation form as;

$$Y = -2.492 + -0.256X_1 + 0.224X_2 + 0.596X_3 + -0.164X_4 + \varepsilon \dots\dots \text{Equation 4.1}$$

Where Y= Performance of building construction projects, that is the dependent variable

X<sub>1</sub>= Existing approval processes

X<sub>2</sub>= Professional regulatory practices

X<sub>3</sub>= National regulatory practices

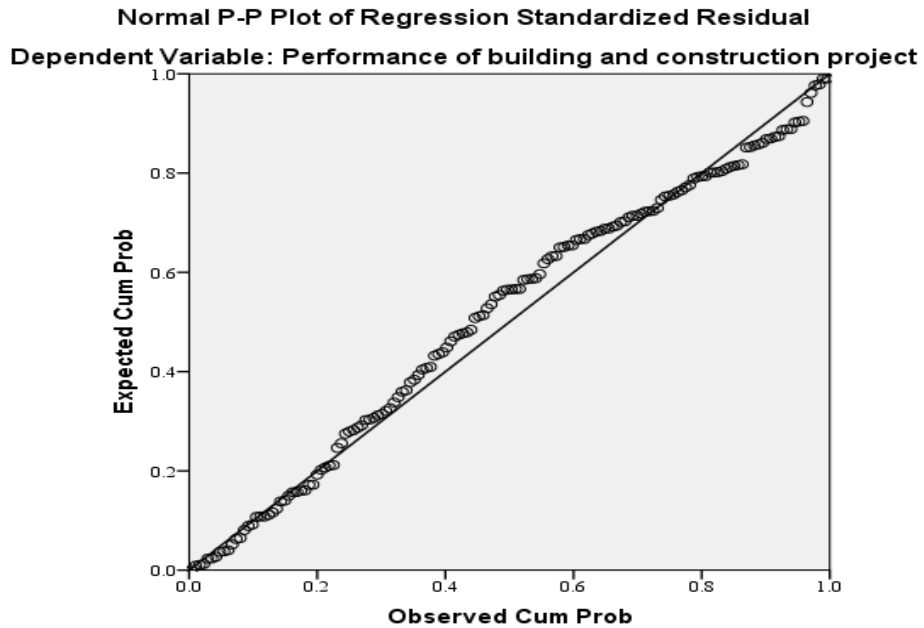
X<sub>4</sub>= County Government regulatory practices

ε = Error Term

#### 4.7 Regression Assumptions

##### 4.7.1 Linearity Test of Independent Variables and Dependent Variable

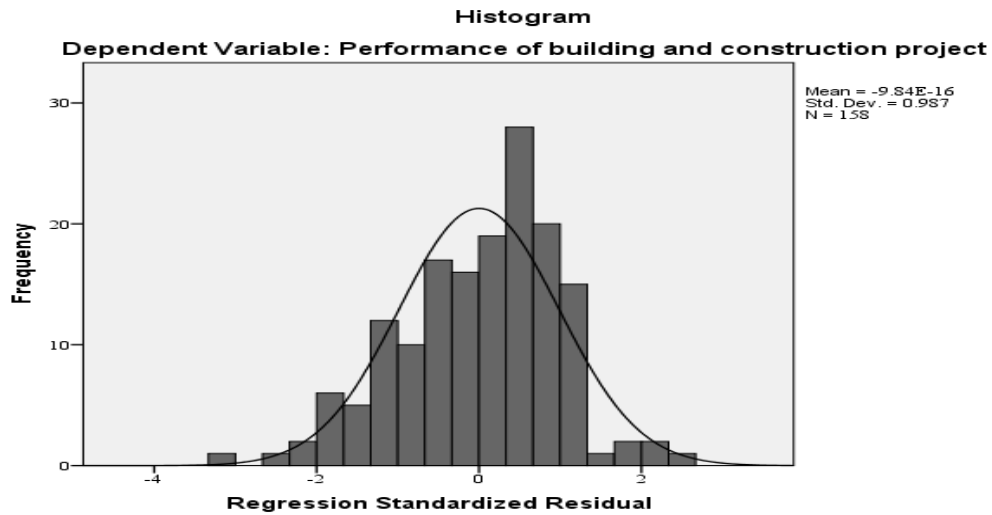
The linearity was tested using P-P plot as indicated in Figure 4.9. The result indicates a normal distribution of the variables following the Best line of fit. The diagrams indicate that the variables are evenly distributed nearer the Best Line of fit. This shows that there was linearity between the independent variables and dependent variable.



**Figure 4.9: Normal P-P Plot for Building and Construction Project**

#### **4.7.2 Normality Test of the Performance of Building Construction Projects**

Normality test was done to determine if there was linear relationship between performance of building construction projects and regulatory framework. Normality assumption was tested using a Histogram. Figure 4.10 shows that the variables are arranged in normal manner balancing on the Best Line of Fit, suggesting that there existed a normal distribution between regulatory framework and the performance of building construction projects.



**Figure 4.10: Histogram of Performance of Building Construction Projects**

#### **4.7.3 Multicollinearity (VIF or Tolerance) Assumptions Tests**

Multicollinearity test conducted in order to establish if the independent variables were highly correlated among themselves, revealed that multicollinearity did not exist since the VIF falls between 1-10 as shown: Existing approval processes (2.871); Professional regulatory practices (1.314); National regulatory practices (1.599); and County Government regulatory practices (2.304). It can be interpreted that since there is no multicollinearity, findings of the study are valid as suggested by (Osborne & Waters, 2002). Table 4.9 presents the results of multicollinearity test.



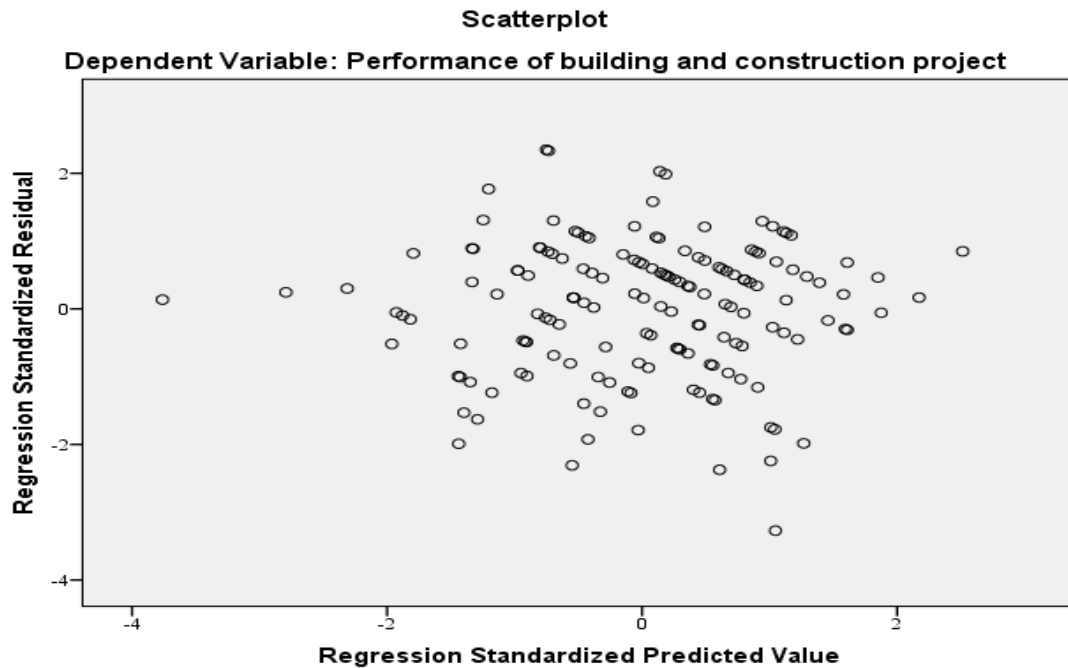
**Table 4.9: Multicollinearity Results of the Impact of Regulatory Practices on Performance of Building Construction Projects in Murang’a County**

Model	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
Existing approval processes	.348	2.871
1 Professional regulatory practices	.543	1.314
National regulatory practices	.648	1.599
County Government regulatory practices	.550	2.304

Source: Survey Data (2023)

#### 4.7.4 Homoscedasticity Assumption Tests

Scatter Plot was used to test the homoscedasticity assumption. The scatter plot revealed that the performance of building construction projects was evenly impacted by regulatory framework. Figure 4.11 shows the Homoscedasticity assumptions.



**Figure 4.11: Homoscedasticity of the Performance of Building and Construction Project**

#### **4.7.5 Auto Correlation-Durbin Watson**

Durbin Watson is based on the residuals and whether there is correlation between the case and the magnitude of the residuals. In Table 4.10, the Durbin Watson value was 1.914 therefore since the values are  $< 4.0$ , it means there was statistical relationship between the regulatory practices (IV) and performance of building construction projects (DV). It implies that regulatory practices impacted the performance of building construction projects in Murang'a County.

**Table 4.10: Auto Correlation - Durbin Watson Results of the Impact of Regulatory Practices on Performance of Building Construction Projects in Murang’a County**

<b>Model</b>	<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Durbin-Watson Estimate</b>	
1	.680 <sup>a</sup>	.462	.448	2.013	1.914

a. Predictors: (Constant), County Government regulatory practices, Professional regulatory practices, National regulatory practices, Existing approval processes  
b. Dependent Variable: Performance of building and construction project

For its contribution to knowledge in building regulatory practices, this study suggests that regulatory authorities associated with the building and construction industry should improve the existing approval processes, discourage unethical practices by introducing stiff penalties and sanctions, and improve regulatory services by building capacity, employing more staff, minimizing costs, and conducting regular monitoring and supervision of the building construction projects.

## CHAPTER FIVE

### CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Conclusion

The study to investigate the impact of the regulatory framework on performance of building construction projects in Kenya with Murang'a County. Based on the findings of the study, the following conclusions can be drawn based on the study objectives.

##### **5.1.1 To assess the Existing Approval Processes in Building Construction Projects in Murang'a County**

Overall, the existing approval process was found to have moderate impact on the performance of the building construction projects. The study found that existing approval process is characterized by a lot of weaknesses, unethical practices, high charges of approval, and delays. It can be concluded that the delay in approval process may partly be caused by the number of regulatory authorities involved in checking compliance, as well as the requirement of multiple permits. It was also revealed that legislation cause delay in getting building construction approval. The findings are consistent with that of Gacheru and Diang'a (2015) that cited corruption, ineffective sensitization, and centralization of the services as having negative impact on performance of the building construction projects.

##### **5.1.2 To Investigate the Effect of Professional, National, and County Regulatory Practices on Performance of Building Construction Projects in Murang'a County**

The study concluded that majority of the respondents were of the view that the professional, national, and county government regulatory practices impacted the performance of building construction projects to a large extent. However, viewed separately; professional regulatory practices impacted on overall cost and timely completion of performance of building construction projects in Murang'a County, to a

moderate extent; the national regulatory practices had impacted health and safety of building construction projects in Murang'a County, to a great extent; and county government regulatory practices had influenced cost and duration of building construction projects to a moderate extent. It can be concluded that although professional regulatory bodies i.e. AAK, IQSK, and EBK improved ethical practices among the members, there existed some cases of compromising professionals involved in building construction projects. They also face a lot of challenges that compromise the quality, cost, and time of completion of the building construction projects.

### **5.1.3 To Model the Impacts of Regulatory Practices on Performance of Building Construction Projects in Muranga County**

The findings showed that regulatory framework is statistically significant in explaining the performance of building construction projects in Murang'a County. It can be concluded that existing approval process and performance of building construction project had a positive significant linear relationship. Likewise, there was a positive significant linear relationship between professional regulatory practices and national regulatory practices with the performance of building construction projects, however, there was positive insignificant linear relationship between County Government regulatory practices and performance of building construction project. Similarly, the regression model fitted to examine the impact of each independent variable on performance of building construction projects indicated that overall regression was found to be statistically significant. Therefore, it can be concluded that the existing approval processes and professional, national, county government regulatory practices affect the performance of building construction projects in Murang'a Country. The findings are consistent with the study by Ochieng (2018) that found that government regulations had significant relationship with performance of building projects.

In the view of the researcher, there is a weakness in the existing approval processes that has greatly affected the performance of the regulatory framework regardless of the involvement of the inspectorate. In this regard, an Adhoc committee comprising of all the

regulatory agencies be constituted to look into the same to give a way forward towards great improvement to the regulatory framework

## **5.2 Recommendation**

### **5.2.1 Recommendations from the Study**

The findings have guided the study to recommend the following:

1. The study recommends that all the regulatory authorities at the professional, national, and county government levels should improve the existing approval processes by:
  - i. Reducing the turnaround approval time.
  - ii. Removing duplication of duties.
  - iii. Automation of the systems for ease of access of the services
2. Discourage unethical practices by introducing stiff penalties and sanctions against professionals and contractors who are found to engage in unethical behaviors like corruption and noncompliance with prescribed regulatory framework with a clearly defined construction law
3. General improvement of regulatory services by:
  - i. Building capacity amongst employees
  - ii. Employing more staff for sufficient coverage
  - iii. Minimizing costs
  - iv. Conducting regular monitoring and supervision of the building construction projects.

### **5.2.2 Recommended Areas for Further Research**

The study examined the effect of regulatory framework on performance of building construction projects in Murang'a County, Kenya. Further studies could consider:

1. Replicating similar study to other counties as this would bring out unique practices from other counties based on different geotechnical set ups, difference in walling materials and comparison on approval costs and existing processes which vary from one county to the other.
2. Conducting studies focusing on individual regulatory framework i.e. approval processes, professional regulatory. This will allow future studies to get more insight on how each one affects performance of building construction projects.
3. Longitudinal research could be undertaken to investigate how regulatory practices, over time, would improve the performance of building construction projects.

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## APPENDICES

### Appendix I: Letter of Transmittal of Instruments

Willis O. Ochola,

P.O. Box 21046 – 00100,

Nairobi.

Dear Respondent,

**RE: REQUEST FOR PARTICIPATION IN DATA COLLECTION**

P.O BOX 62000

NAIROBI, KENYA.

Dear Respondent,

I am a student at Jomo Kenyatta University of Agriculture and Technology pursuing a Master of Science in Construction Engineering and Management of the Jomo Kenyatta University of Agriculture and Technology. I am carrying out a research on the *“Effect of regulatory framework on performance of building construction projects in Kenya. Case study of Murang’a County, Kenya”*, and you have been identified to participate in this study in providing information about the project you are associated with.

I hereby kindly request you to fill the attached questionnaire. The information gathered is meant for this study and will be treated with total confidentiality.

Thank you in advance for accepting to co-operate.

Yours Faithfully,

Willis O. Ochola

JKUAT

## Appendix II: Research Questionnaire

This questionnaire is meant to gather information on “**Effect of regulatory framework on performance of building construction projects in Kenya. Case study of Murang’a County, Kenya**”.

### Section A: SOCIO-DEMOGRAPHIC DATA

Indicate by ticking (✓) the appropriate answer.

1. What is your gender? Male  Female

2. Indicate your age in years.

a) 18- 25

b) 26 -34

c) 35-42

d) 43-50

e) Over 50

3. How long have you worked with your Organization?

Less than 5 years	
5 -10 years	
11 - 15 years	
16 - 20 years	
Over 20 years	

4. Indicate the highest level of education you attained. Tick (✓) appropriately.

College diploma	
Undergraduate degree	
Master's degree	
Doctoral degree	

**Section B: Existing approval processes**

Please indicate how much you agree/disagree with the following statements. Answer by ticking (✓) appropriately on a scale of (1= Strongly disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=Strongly agree) Tick (✓) appropriately.

	<b>SD</b>	<b>D</b>	<b>NS</b>	<b>A</b>	<b>SA</b>
Approval permits charges are high					
Long waiting duration before approval of architectural and structural drawings					
There are inconsistencies in regulatory requirements and how inspections are conducted.					
Routine inspection of construction sites is undertaken by regulatory authorities to ensure compliance					
Approval process is affected by unethical practices					
Existing approval process in the building industry is too demanding					
Technology has allowed better tracking of the approval process					
Multiple permits and legislation cause delay in getting building construction approval					

5. To what extent do existing approval process affect performance of building construction projects in Murang'a County?

To no extent	
To a little extent	
To moderate extent	
To a great extent	
To a very great extent	

**Section C: Professional, national, and county regulatory practices on performance of building construction projects in Murang'a County.**

Please indicate how much you agree/disagree with the following statements. Answer by ticking (✓) appropriately on a scale of (1= Strongly disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=Strongly agree) Tick (✓) appropriately.

<b>Statements on Professional regulatory bodies</b>	<b>SD</b>	<b>D</b>	<b>NS</b>	<b>A</b>	<b>SA</b>
Professional regulatory bodies ensures that building constructions comply to Architectural and Structural regulations					
Professional regulatory bodies give adequate training and licenses to their professionals					
AAK, IQSK, and ERB enhance ethical practices among the members					
IQSK safeguards observation of conditions and costs of building contracts					
Cases of compromising professionals involved in building construction projects are high					
There is adequate professional inspection of materials and process during construction					

6. To what extent do professional regulatory practices affect performance of building construction projects in Murang'a County?

To no extent	
To a little extent	
To moderate extent	
To a great extent	
To a very great extent	

7. Please indicate how much you agree/disagree with the following statements concerning national level regulatory practices. Answer by ticking (✓) appropriately on a scale of (1= Strongly disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=Strongly agree) Tick (✓) appropriately.

<b>Statements on national authorities' regulatory practices</b>	<b>SD</b>	<b>D</b>	<b>NS</b>	<b>A</b>	<b>SA</b>
NEMA put in place effective environmental policies to guide building construction projects					
National regulatory authority officials conduct regular onsite inspection of building construction projects					
NEMA guidelines for conservation of natural resources are effective					
NEMA provides mitigation measures to deal with environmental issues associated with building construction.					
NCA published code of conduct guides building construction projects in the county					
NCA had reduced incompetent construction contractors					
National regulatory authorities provide adequate sensitization on regulations to all the stakeholders					
Contractors only work with NCA accredited construction workers and site supervisors					
National regulatory authorities effectively enforce their regulations					
National regulatory authorities have improved the quality of workmanship in construction projects					

8. To what extent do national regulatory practices affect the safety of building construction projects in Murang'a County?

To no extent	
To a little extent	
To moderate extent	
To a great extent	
To a very great extent	

9. Please indicate how much you agree/disagree with the following statements. (1= Strongly disagree, 2= Disagree, 3= Neutral, 4= Agree, 5=Strongly agree). Tick (✓) appropriately.

<b>Statements on MCG regulatory practices</b>	<b>SD</b>	<b>D</b>	<b>NS</b>	<b>A</b>	<b>SA</b>
MCG only issue permits and licenses to qualified contractors					
MCG has adequate institution capacity to enforce the building construction regulations					
Personnel attached to supervision of construction regulations at MCG are held responsible when they fail to perform their work responsibly					
In MCG cases of unethical practices involving inspection of buildings during or after construction are high					
MCG has ensured competent workmanship throughout the construction project					
MCG officials conducts frequent site visits to ensure conformity					
At MCG building and licensing department issues construction and occupation permits competently and on time					



10. To what extent do MCG regulatory practices affect the cost and duration of building construction projects in Murang'a County?

To no extent	
To a little extent	
To moderate extent	
To a great extent	
To a very great extent	

**Thank you for participating in this study!**

### **Appendix III: Interview Schedule for Key Informants**

Professional regulatory practices (BORAQS, AAK, IQSK, and ERB)

- i. What entails your supervision checklist?
- ii. What is the average consultancy charges for inspection of ongoing project?
- iii. How often do you inspect any ongoing project within your supervision?
- iv. At any given time, what is the average number of projects under your supervision?

National regulatory practices (NEMA Executives/NCA Executives)

- i. What are the charges associated with issuance of construction licenses and/or permits?
- ii. How long does it take to issue a permit?
- iii. What roles do you carry out post-approval?

Murang'a County Government regulatory practices (County Executives)

- i. What fixed costs are normally incurred by developers during approvals and incase of any variation approval costs, what determines?
- ii. How often is an ongoing project subjected to periodic inspections and how is monitoring carried out to ensure completion?
- iii. How long (averagely) does an application take from submission of documents to the approval time?
- iv. What are the requisite required during the approval process?

#### **General Questions**

- i. What challenges do you face during your undertakings?
- ii. How do you plan to improve service delivery?
- iii. What is your opinion regarding timeliness, cost, quality, and health & safety?

**Thank you for participating in this interview**

#### **Appendix IV: Focus Group Discussion Guide**

The FGD was for 8 participants including a Public Health Officer, Sub County Planner, NEMA officer, NCA officer, Contractor, Engineer, Architect, and a Site Supervisor.

- i. How long does it take to supervise an ongoing building construction project within its time of execution? *Probe for explanation.*
- ii. In your own opinion, what causes buildings to collapse in Murang'a County?
- iii. Discuss performance of the building construction in Murang'a County, focusing on timeliness, cost, quality, as well as health & safety. *Probe for explanation.*
- iv. In your own opinion, how can the regulatory framework be improved for better performance and service delivery. *Probe for explanation.*

**Appendix V: Raw Data from SPSS 24**



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