UNIVERSITY OF NAIROBI

DEVELOPMENT OF BUILDING REGULATIONS IN KENYA: ASSESSING THEIR IMPLICATIONS FOR URBAN RESILIENCE

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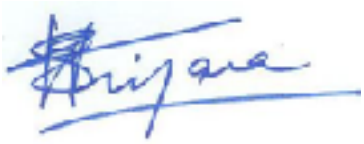
Doctor of Philosophy in Architecture

DECLARATION

I, **George Kigara Kamweru,** hereby declare that this Ph. D Thesis is my original work and has not been presented for a degree in any other University.



24 July 2023

Signed ..... Date .....

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DECLARATION BY SUPERVISORS

This Ph.D Thesis has been submitted for examination with our approval as University Supervisors.

1. **Prof. Owiti A. K'Akumu**

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2. **Prof. Robert W. Rukwaro**

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Acknowledgement

This research work is a labour of love and represents a passionate interest in the process of our national development and the contribution of our professions in it. That is an on-going interest and the completion of a thesis merely opens another chapter in a long journey. As much as this has been an involving endeavour, it foreshadows a more intense involvement for the search for effective channels of impact.

I would like to thank those who have been part of this search. Most immediate are the supervisors at the University of Nairobi, Prof Owiti K'Akumu and Prof Robert Rukwaro, whose input, guidance and continuous encouragement made a huge difference in the progress of this work. To them is owed a huge dept of gratitude and best wishes in their own work.

I would also want to thank other colleagues in the faculty who participated in the various seminars in which this work was presented. Their insights and suggestions made for a sharper focus and no doubt helped to improve the approach in the research.

In the background are my family members who had to endure my long absences from normal family life as I sat ensconced with the various tasks that a work like this entails. For them, this work is a dedication and will hopefully serve as a inspiration to the younger members of the immediate and extended family.

In social encounters are many sources of inspiration. The broad hope that we have that our towns and cities will deliver opportunity, prosperity and fulfilment in our lives serves both as a challenge and an inspiration to work to bring out insights into how our cities can best be organised to meet these aspirations. To all who are part of my social circles and who, probably unknowingly, provide the fire that drives my passion, I offer my gratitude and hope that this work will in some way reward the times spent ruminating and reflecting.

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Abstract

This research arises from a concern for the impact of urbanization on the quality of life in the cities. In a rapidly urbanizing environment, the tools and instruments of governance are stretched and tested and their agility and versatility is critical for the survival of the cities. Building regulations are one such tool of governance which has crucial importance in the shaping of the physical fabric and spatial quality of the city. The question at the heart of this research explores the efficiency with which the regulations are able to bear this responsibility.

Historical survey suggests that this question is critical. The ability if cities to ensure sustenance of life depends in no small measure on the agile regulatory regime. The research uses a qualitative approach to interrogate the available set of regulations and using a datum developed by drawing on historical analysis and expert interpretations of resilience makes conclusions regarding the regulations in place. By employing a robust interpretive strategy, focused on a close reading of the entirety of the regulations, the research draws out the character of the Kenyan building regulations and examines them for effectiveness in securing resilience. The outcome of this examination suggests that the regulations are largely introverted and therefore weak in securing the quality of the shared commons. This is related to the finding that resilience is ultimately anchored in the commons and the vulnerability of the city is premised on the quality of the shared domain. Springing from this, the research makes suggestion on possible areas of reinforcement and brings to light questions that would support further research in this area.

Chapter 1 Introduction

1.1 Background and Context

Rapid urbanisation resulting from both the natural growth and influx of population to towns and cities, creates a commensurate expansion of the urban systems and the complexity of relationships that govern them. Among the visible manifestations of this growth is the increase in the stock of buildings and a rising sophistication in the process of realising such buildings. The population increase also manifests itself in a more complex set of relationships that contribute to making the city liveable and support the totality of human life.

The United Nations in their study of African cities have estimated that in the decade 2010-20, the urban population in Eastern Africa will grow by 50%. In the year 2040, the increase in population will reach five times the figures for 2010. (UN, 2014). This rate of growth is however not matched by an increase in the capacity to manage it and therefore has the potential to upset the stability of the urban system.

A rapid growth in the urban population without a commensurate capacity to regulate the resultant environment, has echoes in history and notably the industrial revolution cities of Europe in the early part of the 19th century. The crisis that arose from these cities led to the creation of far-reaching systems of urban management and introduced urban governance.

This research is inspired by a similar concern for the broader health of the city and the contribution made by one important part of the governance mechanism. The focus is on building regulations and an interrogation of the consensus that they represent. At the centre of the concern, is uncertainty about the manner in which the process of building regulation may be affecting the critical outlook and commitments that underpin the health of the urban systems.

Urban environments emerge as a human necessity. (Mumford,1961). In the next chapter, a nuanced discussion on the emergence if cities in human development is presented. In the contemporary world, cities and urban areas generally are perceived as offering a degree of efficiency and enhanced opportunity for its occupants. In this respect, cities may be seen both as an artificial human institution but one that is inevitable in the overall scheme of human development. Human beings have, in an accelerating dynamic, drifted towards the urban environments to the point where the United Nations estimates that worldwide, the growth of human population has now tilted the balance in favour of urban dwellers and that since the mid-2000s - probably around the year 2005 - more human beings live in urban areas that those who do not. (United Nations, 2014). This is a revealing milestone and foreshadows what the prospects are for the majority. The trend towards urbanization is one way and the foreseeable future of the human race is going to be dominated by urban living.

It follows from this that the quality of life in the urban areas will translate in a big way to the aggregate level of satisfaction at the national level. To achieve a broadly satisfactory outcome, the various contributory factors will have to be well understood and the manner of their operationalization made explicit.

The process of regulation of buildings has a deep “political” angle in as far as it is deeply invested in the fortunes of society. There is an important technical aspect of the regulations, to ensure that the desired results can indeed be achieved through the application of scientific understanding of the best way to provide and shape living environments. The technicalities of the provision of shelter seek to create an environment within the comfort zone of a human being, both in terms of the physical dimensions and aspects of the space, and the sensorial aspects. The physical aspects provide a space where the human frame can move in and perform normal human functions in a natural manner and also be protected against heat, harsh light, noise or other environmental

extremes. The other dimension seeks to satisfy the normal curiosities of a human being and a sense of being a part of the ecosystem.

Brought together, the various components of societies efforts create a living environment characterised by relationships and which benefits from the economies of scale in the provision of critical support functions. It is within such an environment that society develops in all its complexities.

The process of building a living environment is primordial and inherent in every human being and human society. The concept of shelter is deeply embedded in our psyche (Moe, 1977). [11] Individuals have a natural desire to shape their living environments to their taste and their sense of comfort. Like the taste for food or choice of clothing, it is an instinct that we are loathe to impose without a compelling reason.

The nature of the urban environment however requires for mediation in the process of inevitable sharing that makes for a workable and economical arrangement. The complexities of the urban environments, and their governance have been a concern for scholarship for a long time. The reason for this is that the ideal arrangement would seem not to have been arrived at. (Kostof, 1993; Jacobs, 1961; Mumford,1961; Gehl,2010).

As a living environment, the city is a dynamic, organic entity. It has a metabolic dimension requiring inputs - like energy, food, water - and creating outputs- like manufactured products, garbage, pollution, and physical developments. It is also a social environment involving interactions between people for mutual benefit. These issues lead to the need for governance and self-expression. Cities eventually are known as places of culture, politics, commerce and enlightment, products of this dynamism and complex set of relationships.

As a living environment however, the fundamental purpose of the city is to support and nurture life. This is the most critical function it must maintain and preserve. A threat to a city's ability to sustain life is an existential threat and would offend the most basic of social tenets.

The purpose of governance ultimately aims to preserve this capability, in a manner that also preserves other freedoms that are natural to human beings. The threats to this balance could come from different sources; internally by the actions of the citizens themselves, but also from external factors like natural forces - floods, earthquakes, or aggression of the military kind. If and when disruption occurs, a recovery of the balance becomes a profound concern.

Governance seeks to create this balance by setting boundaries for individuals and assuring the common good. This however cannot be enough. A more nuanced engagement of the population is necessary. A deeper exploration of the relationships that inform this dynamic is necessary to discover how the desired outcome can be arrived at with a degree of surety.

The other aspect however requires that society is convinced that indeed the set standards represent what society wants and can afford. By their nature, the process of regulation sets standards which are deemed to offer the best guarantees of the quality of facilities that will be utilised by unknowing users. A minimum and optimum standard may apply to different aspects of a building, and a choice has to be made about where the line of acceptability will be drawn. (Productivity Commission [PC], 2004)

In this sense, regulation employs legal instruments for the implementation of social-economic policy objectives (Hertog,1999). The import of this is that individuals in society can be compelled to comply with a set standard or a prescribed course of action. But the law also rides on the perception or assumption, that it represents the best interests of the society.

This study sought to examine this point of convergence to determine how a consensus position can be arrived at. It is based on the presumption that such a consensus is critical in protecting the life

supporting function of the city, and that in the event of a traumatic shock on the city, this point of convergence assumes an even greater significance.

Although Kenya has had a building code for many years, there is broad agreement that this has not led to the desired quality of urban environment. (Kabando and Wuchuan, 2014; Yahya et al., 2000). Whereas several efforts have been instituted by the authorities to try and resolve a perceived weaknesses with the existent laws, no evidence exists to show that this has led to an improvement (Kabando and Wuchuan 2014). This situation has been blamed by some scholars for the unsatisfactory approach in the provision of urban housing (Yahya et al., 2000).

The quality of urban environments is related to the overall development trajectory of the nation on account of the fact that majority of the population will, in the next fifteen years or so – counting from the end of 2020, will be living in the urban areas. Projections for the city of Nairobi show a possible five fold increase in the population before 2050. This realisation has led to efforts by government to place more emphasis on the evolving quality of the urban environment through the development of governance structures and specific policies. (National Urban Policy, [NUP] 2016).

The provision of facilities for living (housing) and for commerce, is largely an act of individuals acting on their own initiative and in many cases inspired by the possibility of profit. The growth of urban areas is therefore fuelled largely by commercial calculations to respond to a demand for space. Most of the growth of the urban environment is driven by, and happens on, private land although the resultant environment must be considered to be public. The quality of the resultant urban environment is a public good as is the system of public spaces, including streets, parks and urban squares that connect and link all the facilities in a locality.

There is therefore a public concern for the resultant quality of the urban environment. The building activity can and will produce both positive and negative externalities (PC, 2004). The positive externalities refer to the benefits by people other than those directly engaged in a particular activity

without paying for them. The negative externalities (or spillover costs) refer to the costs experienced such as noise or poor aesthetics which impact of people not involved with the activity. (PC,2004)

The overall result of these activities of urban development define and give character to the living environment. The city is thus a conglomeration of activities by different players and in each of these actions are the possibility of both positive gain and negative outcomes. The pursuit of self-interest does not necessarily translate to an agreeable outcome for all and conflicts are bound to emerge.

Public authorities express the value of building regulations as requirements intended to achieve a minimum standard of building work and to ensure "the safety, health, welfare and convenience of people in and around buildings".(Ministry of Housing, Kenya,[MoH] 2009). In more recent times, the objective of conservation of resources has been added as part of the goals of the regulations, demonstrating a growth in the understanding of critical concerns for the regulatory process. (MoH, 2009)

Building regulations are therefore concerned with the wider society and its aspirations. Indeed there are unstated goals and outcomes from the institution of rules. Among these are the creation of minimum standards, the educative value of coding and communicating the results of research on the better ways to build, and the encouragement of innovation. (PC,2004).

1.2 Statement of the Problem

The discussion on the question of city resilience revolves around two main issues: The maintenance of the function of the city complex, and, the maintenance of its existence, in the face of threats to both factors.

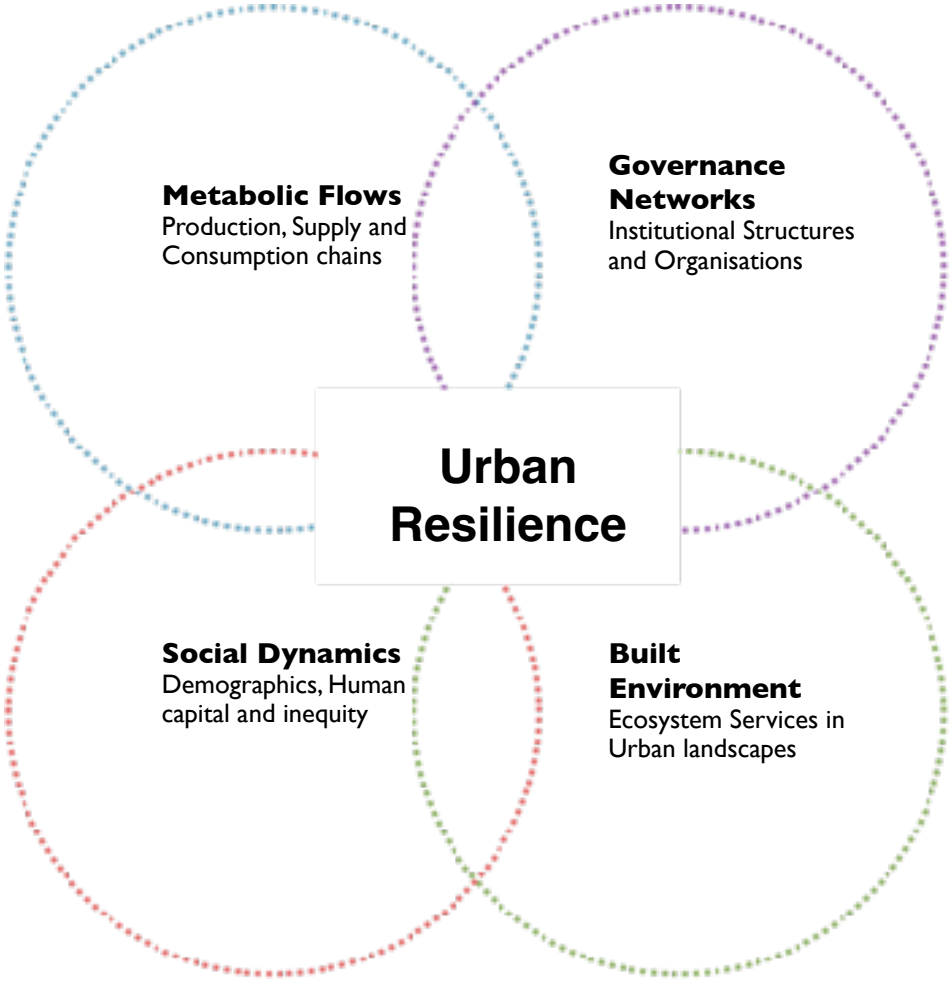

Fig 1.1 Conceptual Representation of Factors in Urban Resilience Source: Rockefeller Foundation

The original conception of *resilience* focussed on the maintenance of function and this remains the critical concern. The maintenance of the function relates to the capacity of the city to continuously support life. This is engineering resilience. (Vale and Campanella,2005)

Ecological Resilience as a concept, connects to the existential function of the city. It expresses the city's ability to harness the live giving characteristics of the locality it is in to create a habitable environment.

The discussions of urban resilience places the question of governance as one of several factors that ensure the stability of the urban system. In the model developed by the Resilience Alliance, (Resilience Alliance, [RA],2012) four factors are identified as the key tenets of urban resilience. These are:

(i) Metabolic Flows: Metabolic flows capture the production, supply and consumption chains that exist to sustain life in the city. These flows may be actively through human effort or passively via natural processes such as weather dynamics.

(ii) Social Dynamics: This relates to population growth structure and the cultural patterns that result.

(iii) **Governance Networks**: This refers to the institutional structures and organisations that are involved in decision making.

(iv) Built Environment: This is the physical aspect of the city including its green spaces and other urban landscapes.

The prior concern to resilience dynamics, is the existential value of the urban settlement and the overriding goal of providing an environment supportive of life. Whereas the factors of urban resilience contribute to the ongoing viability of the environment, there is a higher purpose that must be supported.

The problem then relates to this nexus between the *regulation* which govern day to day activities in one of the areas that contribute to resilience, and the *overall goal* of protecting the existential value of the settlement. The proposition is that unless the regulatory function carries a philosophy that reconnects it to the fundamental goals, those fundamental goals may face a threat whose ultimate outcome is the negation of the viability of the settlement.

It is this that helps to formulate the Research question for this study. In formal terms, the Research Question is stated as:

> To identify the extent to which the Kenya Building Regulations support the objective to build resilient urban environments.

The process of interpreting human needs that results in a decision to build a structure, and the implementation of that decision into a tangible structure, involves the permutation of varied factors. Among these are the knowledge that informs the process (i.e. the knowledge on how to build, which incorporates an understanding of the chemistry and physical behaviour of materials), the demarcation and utilisation of land - including the protection of natural resources and processes, the resolution of possible conflicts, and the proper placement of the building in its social and cultural context which may involve a value system. This complex process allows for relativity of values and creates the difficulty of stating absolutes in the determination of the worth of right and wrong in the building process.

This relativism invites interrogation. Relativism is the concept that points of view have no absolute truth or validity within themselves, but they only have relative, subjective value according to differences in perception and consideration. (Baghramian, 2004) Looking at the nature of the regulatory process through the prism of relativism promised to yield a deeper and more nuanced understanding on how it works to contribute to the wider goals.

The general problem of urbanisation manifests in different ways. The growth rate of urban populations outpaces the economic growth rate, meaning that the response to the needs of the situation lags behind. The overall rate of unemployment in Nairobi is as high as 40% for the working age population and even higher (48%) among the youth. (African Growth Initiative, [AGI],2023)

Urban population growth naturally leads to a physical growth. In an ideal situation the physical growth - delivering optimised facilities for all aspects of life - should be delivered at the same rate as the growth of population. The reality is however different in developing cities and population growth outpaces the physical developments as it does the economic development. This later fact means that a dynamic is generated where survival leads to some premium being placed on

individuals' needs. A latent competition ensues where the common interest becomes a secondary matter.

The problem then manifests in the scramble by the citizens to be involved in the economy and which has a significant impact on the spatial dimension of the cities and urban areas. They manifest in the rapid development of physical facilities, the buildings that house the human functions of the population, and the utilisation of public space. Political pressure is generated by, for example, the lack of sufficient housing leading to a stressful level of demand. The vocalisation of the problem of lack of sufficient housing blames many factors and is rather in need of more nuanced empirical insights.

The problem of how we regulate the building process has been highlighted as a possible bottleneck in the provision of affordable housing and in the lack of social amenities in the living environments. The suggestion is that the regulatory process is not sensitive to the urgent needs of the population or that it prioritises the wrong issues. A clear understanding of the broad issues that the regulations may be addressing is absent in the discourse. It remains a critical question: Are the building regulations serving the broader needs of the urban population?

The question is however not answered in a way that would be persuasive on the link between these factors. A gap in the public understanding thus exists creating the need to probe the question of the impact building regulations have on the quality of the city. The outcome of this question would assist in determining the priority given to the reform of the regulation and the outcome of these efforts.

This study set out to understand the implications of building regulations on urban resilience. Such an undertaking inherently seeks to make a connection between the manner of regulation and control of the building process on one hand, and the quality of the resultant urban environment on the other. It seeks to understand how the inherent meaning and values that are embedded in the statements of

regulation contribute to the ability of the urban environment to withstand the shocks that may confront it.

From the literature review, it is established that the growth of a regulatory regime for the building process, has historically been driven by catastrophes that have been encountered within urban areas, and the compelling need to prevent them from recurring. It is the establishment of authority and a control framework that has been utilised to deal with the most difficult issues in the existence of towns.

Contemporary scholars have sought to highlight urban problems of a new nature not encountered before. Questions that relate to the resultant quality of life, like walkability of the urban environment or the nature of public space have fueled recent writing. (Jacobs,1961; Newman,1972; Speck,2013; Gelh, 2010; etc). Other urban problems that have received increasing attention include the aspect of crime in the urban areas (Newman *1972*, Wilcox et al., 2017), the prevalence of the motor car and the problems associated (Shoup(ed), 2018), the neglect of public space (Gehl,2010, Montgomery, 2014) and the overall walkability of cities.(Speck,2013). Others have focussed on social issues and their contribution to the quality of life in the cities(Harvey,2009; Castlles, 2009; Landry,2008; Florida,2019).

Urban problems have however persisted and it is a continuous struggle to come to terms with widespread problems that have defied solutions. A deeper understanding of the manner of applying the regulatory regime and the dynamics at play, is therefore needed. It is this urgency that informs the current study.

Thus in addition to the prior stated concerns the study stands on the foundation that is concerned with inherent conflict. Cities by their nature create opportunity for conflict and a system of protecting the common good is necessary (Kleniewski, 2019). As has been demonstrated (Obala, 2020) conflict exist side by side with other urban problems. Building regulations, which constitute

an important aspect of the governance system, have historically been a reaction to known problems and have mainly focused on the safety and health of citizens. Safety can be threatened by structurally unstable constructions or by the destructive force of fire. Health concerns related to the availability and proper handling of clean water on one hand and proper disposal of waste water on the other. Health can also be affected by the proper channeling of clean air.

However, when communities are created by the close arrangement of buildings, the shared environment becomes a major factor in the quality of life and in the sustainability of the urban environment. It also becomes a critical catalyst in developing a system of communal values that serve to shape common understandings.

The role that codes play in the shaping of our living environments is not always appreciated, until there is a calamity. Sometimes, the implementation process is unsatisfactory or questionable (Ametepey et al., 2020). Yet the regulations are “the silent protector to the general public” (von Weller, 2003). This viewpoint sheds further light into the research question and the concern at the heart of it: to understand how well the regime of regulation has been able to carry the broader responsibility of ensuring a capacity to recover from stresses that may act upon that environment. To explore this question, it will be necessary to get into a deep familiarity with the Kenya building regulations. That means an engagement with their intentions, their language and their overall tone.

Appropriate research tools are applied to this endeavour from the statement of the research paradigm to the analysis of the material available. A research approach that seeks to get to this deeper meaning as opposed to one that seeks to make detached measurement has a better chance of arriving at the insights carried through the written form of the building regulations.

In this instance it will be necessary to subject the written regulations - which are the formal guidelines - to interpretation so that they can be described and evaluated. (Leddy and Ormrod, 2013). This approach should serve to enable this researcher gain insights about the phenomenon of

regulation and its interactions with the values of the society, and through a process of evaluation, judge the effectiveness of policies, practices or innovations.

1.3 Objectives of the Research

The study set clear and hierarchically related objectives for this purpose. The formal objective of this research are.

1. To interrogate the underlying philosophy of the building regulations.
2. To evaluate the Kenya building regulations in the context of Urban resilience
3. To develop a strategy for fortifying Urban resilience through the building regulations.

The interrogation of the underlying philosophy is necessary to connect with the historical dimensions of the regulation. This is premised on the belief that the beginnings reflect the essence. The search for the essence "honours beginnings" in the words of Louis Kahn (Tyng,1984) and making the connection with the essential thinking of building regulations lays a strong basis for unearthing the embedded meanings. The study therefore seeks to understand the driving forces that created the genetic set of regulations and in so doing to understand better the spirit of this endeavour. This is achieved by a close reading of literature relating to the early efforts of formulating the regulations.

The evaluation of the Kenya building regulations is informed by this benchmark with the express objective to understand how these regulations carry through the underlying philosophy in regard to the urban environment. This leads to an understanding of whether the regulations deliver a significant impact in the society's understanding and participation in the shaping of the environment in a sustainable, resilient manner.

With these understandings, a basis is laid to develop and propose a strategy for fortifying the building regulation to better serve the purposes of creating resilient urban environments. My

expectation in this study is that the insights and proposals that emerge in this study will be a worthwhile contribution to the understanding of how we regulate the building process and what factors make for a more effective process.

1.4 Justification and Significance of the Study

The fast growth of the urban settlements in Kenya and Africa in general provides a challenge for the control and quality assurance of the resultant cities. The phenomenon of buildings collapsing under construction or failures in a myriad other ways makes it impertinent to examine the process in place with a view to mitigate such failure. The resultant urban environment also exhibits a dysfunctional order in crucial zones of human interaction, creating a general sense of a diminished environment and harbouring insecurities. The control of space use in these environments seems to have broken down.

Among the measures available for this control is the building regulations. This study seeks to contribute to an understanding of the best way to formulate the building regulations. For the regulations to be effective, there needs to be broad awareness of their existence, and acceptance of the values they represent and a willingness to adhere to their dictates. This compliance is largely lacking despite the fact that building developments are still being realised. The gap between this reality and the desired situation can be narrowed with greater acceptance of the rules and thus reduce the possibility of diminished quality or disaster.

The regime in place to regulate building practices has been faulted for failure to be responsive to the dynamics of the Kenyan scene. The causes for the various shortcomings are not agreed upon but they generally are seen to be on the operational level, especially in the realm of enforcement. Some scholars have identified specific shortcomings (Kimani and Musungu, 2010; Nzioki, 1992).

This study will seek to elevate the debate and to place the regulations on a higher plane by relating the process of regulation to the existential basis of the city. This will give a deeper meaning to the

regulations and their application in the development process. Such an interrogation may help to clear the confusion surrounding the non-performance of the current code.

Further, it is expected the study will contribute to developing a framework for further advancement of the regulatory regime. The ultimate result of this exercise will be an understanding of the underlying philosophy that must be harnessed in order to create a regulatory regime fully in harmony with the spirit of the city and its environs.

1.4.1 Assumptions or Proposition of the Study,

In the foregoing, a proposition for the study is indicated. The proposition is that unless the regulatory function carries a philosophy that reconnects it to the fundamental goals of a living environment, those fundamental goals may face a threat whose ultimate outcome is the negation of the viability of the settlement.

The sustenance of life is key to this understanding. Human being, and indeed other creatures, are wired to create conditions that will support the goals of creating and bringing forth a new generation of themselves. In this process, the instinct protects the interests of the individual and the immediate family, especially the offsprings. The study is partly focussed on seeing how this is supported through the consensus that the building regulations represent.

1.5 Scope and Limitations of the Study

1.5.1 Conceptual scope

Jabareen (2009) offers a method of building a conceptual framework for phenomenon that are linked. He points out that a conceptual framework “is not merely a collection of concepts but rather a construct in which each concept plays an integral role”. The conceptual framework provides an interpretative approach to social reality.

In this study, it is intended to develop the link between the application of building regulations and the fundamental basis of the city. Further the study seeks to interrogate how the application of the regulations affects the resilience of the urban environment.

Three concepts are involved here: The springing point focuses on the concept of the existential roots of the city bringing to the fore the philosophy that underlies city development. The second key concept is urban resilience which looks at the city as a ongoing, living concern and the third concept looks at governance and regulation as a necessary step in maintaining the balance in the city.

The relationship between the three concepts can be seen in two steps. At the first instance, there are factors that anchor the urban environment as a necessary and suitable habitation. These factors are directly linked to the support of life and the primordial needs of man.

The concept of Resilience and governance are then aspects of a broader concern.

The primary thrust of the study is to interrogate and substantiate the link between these concepts and to explore the connection between the actions at an immediate level to the more fundamental dimensions of the urban environment.

The material that is sought for analysis and to develop the understanding, is Kenyan material; developed by and for the Kenyan experience. Whereas this is acknowledged as a framer of the conceptual scope, the universal nature of the building process and the search for shelter underlies all other understandings.

1.5.2 Temporal Scope

The study, as formulated in the subject matter, straddles across temporal dimensions. In as far as it concerns itself with building regulations, the study focuses on a matter that might shift in interpretation and in its statement from time to time. Regulations are revised periodically and in this respect will not remain static for long.

On another plane however, the relationships that develop in the appropriation of land for urban settlement relate to a primordial dimension and will withstand change and interpretation over a long period of time. In this respect therefore the study seeks to look at the phenomenon of governance as an abiding aspect of a dynamic human culture and which will traverse time in different forms.

1.5.3 Geographical Scope

The study is rooted in the Kenyan experience. The focus of the study is the regulations developed for the building process by the Kenya government and which as a result, reflect the experiences within this jurisdiction. Whereas the process of creating shelter and building facilities which are covered by regulation is universal, variation in outlook which may affect the language, emphasis and strictures within the regulations, can be expected to vary with jurisdiction. The Kenyan regulatory documents are not rootless but rather embody the experience within this geographical scope.

Reference is however made to experiences further afield both in the contemporary time and through historical citations. This has helped to enrich the theoretical framework and provide a richer contextualisation of the matters under discussion.

1.6 Definition of Terms

In this study, some key terms recur and reflect the thrust of the enquiry. The main terms are the ones in the title and in the discussions.

1.6.1.The Key Terms

Urban environment captures the idea of a dense settlement that is a habitation of a human population and which has the infrastructure to support human functions. An Urban environment need not be recognised as such in a formal sense, but its dynamics are still of interest. An urban environment will be characterized by a range of activities supporting human life. In this study our

concern is with the management of dense developments which may occur without administrative acknowledgement but which must deliver functionality on a day to day basis.

Cities are political entities. A city will most likely have delineated administrative boundaries but is characterised by an intense density of use. The term city and town are urban areas with known boundaries usually set for political administrative purposes. In some jurisdictions, and Kenya is an example, these terms are protected and bestowed with due process. In academic discourse however, there is a more liberal use of the terms and most scholars use the term city to incorporate what would otherwise be labelled town or municipality.

In the study the more liberal use of the term is adopted and the term city will be used in favour of town or municipality. However the context will reveal if the term town is used in the regular sense.

Resilience in this study means the capacity for a city or urban area to continue as an effective life sustaining environment. Resilience is a broad term and now used with difference meaning by almost every academic aspect of social science. In this study the prefix “urban” is attached to emphasise the focus on the built environment. Unless the context indicates otherwise, the term resilience without the prefix will have the meaning above.

Within the study, there is further elucidation on the concept of resilience (Chapter 2). Other entities have indeed offered differently stated definitions but which do not substantially deviate from the definition adopted above. The definition of Urban resilience offered by, as an example, the Rockefeller Foundation (Rockefeller Foundation, [RF] 2023) as “the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience.” would be good approximation of the meaning applied in this study.

Implication is used in its most common meaning. The Oxford Languages dictionary indicates the word to mean “the conclusion that can be drawn from something although it is not explicitly stated”.

This in the main is the meaning adopted for this study. A second meaning from the same source is indicated "as the action or state of being involved in something."

The first meaning is adopted for the embedded sense of interpreting or drawing meaning. It alludes to the process of interpretation which gives a fairly accurate pointer to the nature of the study and the manner in which the entities of the *building regulation*s and *urban resilience* are related.

As a matter of comparison, the Miriam Webster dictionary defines implication to mean something implied: such as *a possible significance.* Used as a verb, it means *the act of implying.*

1.6.2 Defining "Regulation"

"*Regulation*" exists in the English language as both a noun and a verb. The verb "*regulate*" denotes an action that may sometimes result in the creation of a "*regulation*"(noun). The Collins English Dictionary indicates that Regulations are "rules made by a government or other authority in order to control the way something is done or to control the way people behave". The same dictionary adds that when used as an uncountable noun, Regulations (n) are "the controlling of an activity or process, usually by means of rules".

The common understanding of *the building code* is a set of regulations written by city or county officials with the help of construction professionals, that governs the design, construction and modification of commercial buildings, homes and other structures in the jurisdiction. (Miriam-Webster dictionary). The critical issue here is that the code is usually a specific set, usually packaged out as a document. However, such documents are also frequently labelled as *building regulations*.

1.7 Structure of the Report

Whereas this study is basically focussed on the framework of the Kenyan building regulations, it seeks to develop a backward linkage to the historical source of building regulations and make connection with the spirit the has driven this aspect of urban governance; and further, make a forward linkages into a possible future of the regulations.

Chapter 1, the current chapter seeks to give a brief overview of the context of the study. It makes the case for a need for such a study arising from the dynamics of urbanisation. This sections also formulates the research problem and indicates the specific objectives of the research.

Chapter 2 is the Literature review and theoretical framework. It seeks to anchor the study on a broad review through literature of the history of the regulations. The main purpose of this survey is to unearth the critical aspects of the regulatory regimen including the placement of responsibility and the system of enforcement, and to make the connection between the need to regulate on the one hand, and the problems created by dense settlement, where inevitably a protocol for shared resources has to apply.

This section also lays down the theoretical framework that informs the thesis and seeks to arm the researcher in critical ways: It reveals the critical concerns that drove the formulations of the code and in so doing, points to the areas of stress in the urban environments. In addition the survey reveals the sensitivities of imposing such a foreboding regime of regulations on what is a natural, or primordial activity: in this case the construction of “shelter” which every human being is natural predisposed to engage with. These insights are useful beacons in the examination of the process of regulation.

The next section, Chapter 3, sheds light on the analysis of the material by explaining the methods used and how they have been used. The chosen methods of analyzing the state building regulations is explained in the relevant chapter and is geared towards teasing out embedded and sometimes

implied meanings in the regulations. As a social phenomenon, the construction of the regulations is a play on the minds and thought processes on those who get to apply them. As a consequence, a level of subjectivity applies in the statements and in the reading of them. An understanding of the regulations can only be achieved through a process of interpretation and categorisation.

The results of this analysis are then presented in Chapter 4 and Chapter 5, and conclusions are drawn about the possible meanings that are embedded. The answer to the research problem emerges in the aggregation of these insights.

Chapter 6 seeks to apply the developed insights into a case for the fortification of existing regulations. Chapter 7 is the Conclusion of the study.

In looking into history, the researcher is on fairly solid ground on account of the historical literature available that has gathered the experience of more that two centuries of engagement. Clarity and profundity are the reward of such a survey and lays a foundation to interrogate the present circumstances. In the study a summary is formulated from this historical examination and used as a guide in the later part of the process.

Chapter 2 **Literature Review**

2.1 Introduction

Global urbanization has, in the first decades of the 21st century, created a majority of humanity as urban dwellers. By 2030, it is projected that every region in the world will have most of its people living in urban areas. (United Nations, [UN] 2010). Arising from this dynamic, the nature of the city as a human institution and especially its proper functioning, is now receiving heightened scrutiny from scholars and policy makers around the world. A multiplicity of publications on cities have emerged in recent years. (UN, 2020; Gehl,2019; Speck,2012; Harvey,2009) The focus of this interest has overwhelmingly been in the impact on quality of life, and the need to make cities more humane. The thrust of the recommendations relate to the need to reorient urban planning and urban design, and to reconsider the relationships that develop in the interactions that constitute daily life in the urban areas. (Speck,2012; Newman,1973; Jacobs,1961; Gehl,2013; Gehl,2019; Jacobs,1961).

It is a natural desire of all human beings that the environments they live in can support and nurture life, and afford them a measure of security in their daily endeavours. The rapid growth of urban environments places a big challenge to the administrative structures and governance of cities to ensure that they continue performing this fundamental role. However, the city as a living environment, while not a new development in human history, is prone to challenges, whose outcome is sometimes to compromise the very life sustaining quality of the city.

The governance of the cities has a bearing on the overall level of security and comfort for the citizens. This is especially so in the impact of action that the inhabitants engage in in pursuit of self-

expressions and the assurance of their security, the “intricate mingling of different uses in cities”. (Jacobs,1961; TED, Books, 2013)

The concept of urban resilience which is the subject of this study appears only tangentially in the early studies and writings about cities, although in more recent works it receives explicit scholarly attention. The spirit of resilience however, colours the thinking of scholars of the urban phenomenon across the decades.

The key objective of this review is to see the connection that has been made between the governance and the overall workability of the city, and to seek the genesis of building regulation. The subject of sustainability and later the concept of resilience have been introduced in the lexicon of urban studies in recent times. However, the issues that have shaped governance go back a longer period. This review seeks to look at the various themes that have informed this debate over time.

The organization of the chapter is thematic. The subject is broken down into four areas which would indicate where the subject has developed to as follows:

First, an examination of the City as a human institution to reveal evolving thoughts about the nature of the life-supporting capacities of this form of settlement. Secondly, the nature of stresses that act upon this environment will reveal where interventions are needed and the primordial need for such interventions. This should give the inquiry a deep grounding on the purposes of building regulations and regulation in general.

Third, the broader subject of urban resilience will reveal the growing concern with the dynamics of urban durability and how it is sustained, and fourth, an examination into urban governance will help clarify the nature of the processes of enforcement of rules, for the common good.

2.2 The City as a Human Institution.

2.2.1 The medieval cities

The historical development of the urban form has mirrored the development of society. Rapid progress in the human condition has translated to discernible development in the form of the urban settlement, and in a growing complexity in the relationship between varied elements that make up the city. In that process, new and unexpected limitations and challenges in the way the city is organised, have been revealed. As a physical entity, the city is first and foremost seen to occupy space on the landscape, which creates a challenge of accommodation of the terrain or landscape. (Norbert-Schulz,1979) This physical occupation will either result in a perceptible structure, or require one. Early studies in the nature of the city focussed in the main on the utilisation of physical space.

Cities have long been associated with human survival and have been defined as inevitable outcomes of the process of nurturing life. (Mumford,1961). The agricultural revolution, the moment when societies transitioned to settled agriculture, is a critical part of this evolution. The need to manage the food surplus that resulted when agriculture was made more efficient, led to the need for permanence of residence and a clustering of such residences (Morris, 1994). These early settlements took on patterns and forms that are determined by factors beyond human control. Among these were the climate, the topography of the land and the available resources for building.(Morris 1994; Mumford 1961).

These early forms of the city were focussed on basic survival from marauders and hostile neighbours. Food security was a critical part of the functions of the city. Elements like city walls and gates characterised these forms and society was organised in a tight formation to ensure the survival of all.

The ability of the settlement to sustain life is seen to be the critical factor to its viability. Availability of drinking water is essential as is the source of food. (Morris 1994). The availability of these life sustaining factors determines the location of settlements. The form of the city is therefore linked to the land and the continued life sustenance qualities. It has been observed that a necessary condition for the development of the medieval city is an agricultural surplus. A number of agricultural breakthroughs preceded the development of cities in the Near East: grain was domesticated, irrigation systems were developed, and the plough replaced the hoe. Together, these innovations helped agricultural workers to produce a surplus of food, allowing some people to pursue nonagricultural activities in cities. (Mumford,1961, Morris,1994, O'Sullivan,1996).

This postulation of how cities emerge and how they grow, links the urban settlements to existential survival of the occupants. So we see that cities are necessary for more efficient care of the young through a communal effort. They are also crucial for the protection of the productivity in agricultural efforts, a process stretched out in time. (Mumford,1961).

Cities then are not just the saviours of man: by making it possible to grow and store food, and by helping to nurture and protect the young, but they become the nucleus for culture and the complexity of human life. An important part of the argument by Mumford, which connects his reading of the medieval city to the modern settlement, is the conceptualisation of the city as a set of "containers", in the pursuit of the economies of scale. He notes:

> Mark how much the city owes technically to the village: out of it came, directly or by elaboration, the granary, the bank, the arsenal, the library, the store. Remember, too, that the irrigation ditch, the canal, the reservoir, the moat, the aqueduct, the drain, the sewer, are also containers, for automatic transport or storage. (Mumford, 1961,p16).

We see therefore that the urban environment is an important and natural result of human biological needs and social needs. (Mumford,1961; Kostof,1992; Doxiadis,1975: Dubos, 1975). This contention is significant. In its fundamental form, the urban environment serves an existential

purpose, and out of this, springs the value of the systems that may evolve to deal with the complexity of this form of settlement.

2.2.1.1 Preservation of Value

This direct relationship with human life raises a need to preserve and sustain the existential value. In a psychoanalytical perspective, the city represents a humanitarian institution, geared to the accommodation and preservation of human life. It represents in a microcosm man's relationship with the earth itself (Mumford,1961).

The city has an inherent need to preserve and sustain its existential value and guidance to this end is necessary. Unguided, towns and cities do not achieve vitality. (Talen, 2010). The concept of the city as an inevitable form in the human universe creates a useful springing point for further enquiry and its ingredients shed useful light into the nature of this phenomenon.

The factors that determine city locality are varied but include the terrain and factors that support sustenance like presence of water. What is a constant is a desire to gather people together. This desire is a function of human needs, related to the survival and nurturing of the population. However, each space requires an investment towards the shaping of a satisfactory living environment.(UN-Habitat,2023)

2.2.1.2 The Existential Dimension of the City

The shaping of the city into a habitable environment, involves investment and forms the basis for governance structures. As an institution, it represents the outcome of human efforts geared toward creating a sense of security in the individual and the communal capability to live a full life and nurture the next generation. This investment has significant value and its sustenance is a critical outcome of communal endeavours.

Urban governance is a communal effort and has been described as "the sum of the many ways in which individuals and institutions, both public and private, plan and manage the common affairs of

the city in a continuing process where conflicting or diverse interests may be accommodated, and cooperative action can be taken." (UN-Habitat, 2023)

2.2.1.3 The Primordial Desire for Congregation

The City as a form of social organisation has existed for about 10,000 years making it a relatively recent occurrence compared to the 40,000 years of homo sapiens, the present human form. The past five thousand years, however, starting at about 3000 BCE, have seen cities become important parts of the social landscape in many parts of the world. It has been argued that, once complex societies evolved in a region, the appearance of cities was inevitable. (Smith, 2002).

Thus the emergence of the city as a human institution was unavoidable. In the continuing quest for better environments to sustain life, the congregation of populations into dense settlements was a logical outcome(Mumford, 1961; O'Sullivan, 1996). Broken down further, this need to congregate can be seen as an answer to, one, the primordial need to conduct rituals and ceremonies; two, the static dimension provided by agriculture, and three, the economies of scale - and the need for strongholds - applied to varied "containers" of life (Mumford, 1961).

These views allude to the fundamental raison d'être of the city form and contribute significantly in framing the other dynamics that are consequent to this. It is through the appreciation of this fundamental meaning of the city that we can contextualise the subsequent development that go to shape the city to the human institutions that exist today.

2.2.1.4 Need to Nurture Life

The second viewpoint from Mumford and other scholars, broadly focusses on the need to nurture life. (Morris, 1994; Mumford,1961). This is the most profound insight that Mumford offers as to the reasons for the existence of the city. The need to raise young ones and the desire for a settled lifestyle to maximise this possibility, is a credible explanation on why human beings settle in cities.

> “ Without this communal identification and mothering, the young become demoralized: indeed their very power to become fully human varnish, along with neolithic man’s first obligation - the cherishing and nurturing of life”. (Mumford,[1961]p15).

2.2.1.5 Need for ceremony

The nature of ceremony is social. Ceremony happens in a communal setting and creates the need for such venues to be broadly agreed on. When societal members have some understanding on where meetings should happen, (through a shared sense of spatial qualities, physical or spiritual), the possibility of a settlement taking shape and eventually taking root is heightened. The creation of a place goes to express the essence of being, of existence (Norberg-Schulz,1980). Such places, created for living, embody meaning and have structure. “These meanings and structure are reflections of man’s understanding of the natural environment and his existential meaning in general” (Norberg-Schulz, 1980).

The need for ceremony and eventfulness manifests in the modern city. Cities of today must either develop to meet the challenges of global change or stagnate (Richards and Palmer,2010) The economic environment that cities are required to operate in, create an imperative to become distinctive, to regenerate the urban fabric and to create prosperity for its citizens. The creation and promotion of events such as sports festivals, trade fairs and cultural shows have become a critical component of urban development strategy across the globe, mirroring the ceremonial justifications of older cities. (Richards and Palmer, 2010).

2.2.1.6 Cities as a Repository of Life Containers

The description of the city as a “container of containers” (Mumford,1961) speaks to the notion of efficiency. This construct bring to the fore the inevitability of humans coming together in order to productively organise critical aspects of social life. Underlying it, is the more accessible notion of

economies-of-scale which suggests that certain aspects of human life need to be done socially for them to be efficient and workable.

Such aspects include the broad spectrum of activities that involve “storage” and processing of food. The gathering of grain and storage of water fall in this category. This need to bring supplies and artefacts together in the ultimate genesis of modern day institutions like libraries, museums, banks and even arsenals (Mumford, 1961). All these are containers of some aspect of life, as are transport and transportation (of, say, waste) systems. Cities facilitate the pooling of resources and arrangements that help to sustain and enrichen social life. Cities are the crucibles of culture.

These viewpoints of the primordial nature of the city are reinforced by more recent writings. The city is a reflection of both our complexity as biological creatures and also as social creations, (Hall,1988). Cities represent “civilisation” and are “the central facts of human history”. Hall makes the profound suggestion that the twentieth century city planning as an intellectual and professional movement, essentially represents a reaction to the evils of the nineteenth - century city. (Hall,1988) This viewpoint is important in explaining the development of cities that have largely been guided by planning and governance systems handed down from these historical contexts.

The point that is emphasised in the readings of Lewis Mumford and Peter Hall and which is shared by other writers (Norberg-Schulz, 1980; Doxiadis,1975), is that the city answers some primordial needs of the human race. Its health thus represents the health of the race and would introduce a dangerous disequilibrium if this health were not assured.

This discussion supports the contention that at the core of the urban settlement is an essential quality that relates to the existence of the human race. An important anchor for the study is thus established and will serve as a critical reference point in the discussion of the substantive nature of the dynamics of the city.

2.2.2 Evolution of Urban Systems

Given this predisposition to congregate into cities, it is necessary to examine what the resultant structure is that will give answer to these needs. It is broadly agreed that agriculture provided the necessary condition for the cities to emerge from "the shrines and villages" (Mumford,1961). The introduction of a modicum of technology into agricultural process allowed the creation of a surplus and provided "the *sine qua non* of urban existence, the concentration in one place of people who do not grow their own food" (Davis, 1955)

Clark (1982) makes a distinction between city and village on the basis of political control and social dominance. Cities are conceptualised as entities which benefit by exchanging and accumulating the wealth of several distant areas. This notion adds a useful dimension to the idea of the city as a container of containers as suggested by Lewis Mumford. Cities are gathering places bringing to one point not just the produce of the hinterland surrounding, but indeed the very spirit that springs from the land and terrain that form this hinterland (Norberg-Schulz,1980).

It follows from this observation that the city has a lot to do with the hinterland and with the land it is on. The quality and life sustaining aspects of the settlement can then not be fully appreciated without a consideration of the natural terrain that hosts this settlement.

Pumain (1997) has defined the city by the system of interdependencies it brings up. These involve people, materials and information. These interdependencies, of necessity must include the relationship between the human creation (i.e. the built form of the city and its social content) on one hand, and the natural form of the underlying site on the other. This view point is supported by the work of Norberg-Schulz(1980) and Le Corbusier(1967).

There however does not seem to be much unanimity among the various disciplines on what in the physical dimension constitutes a city. Sociologists, focusing more on the human relationships, tend to have little regard for the physical manifestation of a city. Archeologists on the other hand "are

inclined to call any settlement a ‘city’ which has a few streets and a public building or two”. (Mumford, 1961).

Arthur O’Sullivan provides an economist’s perspective on the growth of cities. The ultimate justification from his point of view is provided by the need to take advantage of economies of scale. In his argument, O’Sullivan finds resonance with other scholars on the nature of the forces that crystallize cities. (O’Sullivan, 1996)

In discussing cities that arose fundamentally as “defensive cities”, a prior dynamic to the need for defence, is the production of surplus produce. This fits well into Mumford’s characterisation of the city as a place for containers, for indeed the storage function presumes containers. Storage and protection of the surplus are seen as a new economic activity, uniquely performed in a city. The logic of scale economies applies to grow the function.

A similar argument is applied to the religious function of the city. Referencing Mumford, O’Sullivan creates a characterisation the religious city which is premised on the primordial desire for ceremony - which he argues is best provided at scale, arguing that the earliest cities developed because of scale economies in the provision of religion. The position taken by O’Sullivan reinforces the notion of a city developing and growing on the basis of a need to protect the very innate needs to man. (O’Sullivan, 1996, p 72-73)

It is notable that later cities ran into problems caused by inability to assert their claims. Athens, a market city, placed itself at the nucleus of a network of cities on which it sought to impose taxes (or tributes). The war that precipitated the decline of Athens in 404 BC was caused by a dispute over this particular matter.

Similarly, the decline of Rome can be attributed to a parasitic relationship with its rural hinterland where agricultural products were obtained by “conquest and tribute”. This collection system was

eventually disrupted by tribes raiding from the North, and winning the dispute. Coercive transfer of resources was the direct result of the decline of both Athens and Rome.

The need to satisfy the internal consumption habits of the city laid the foundation for innovations in production and commerce. The intermediate step was the need to exchange with the hinterland and with other cities. Despite these efforts, European cities still suffered declines in population between 1350 and 1450 caused by famines and plagues - a result of the higher population density and low sanitary conditions.

The city then can be said to grow on the basis of critical relationships that developed that are linked to the existential dimension of its origins. These relationships further clarify the nature of the life sustaining qualities of the settlement.

2.2.2.1. The Nature and Development of Urban Governance

Governance arises from the need to maintain order. A dictionary definition of governance is “the establishment of policies and continuous monitoring of their proper implementation by the members of the governing body of an organisation.” The critical dimension of the process of governing is the relationship of the governors and the governed. All forms of governance have this question at the core.

In the earlier cited work, Lewis Mumford brings forth the notion that the city represents organised morality. The institution of a decision making body, a council of elders is indicated in the earliest settlements. The essential need for a process of governance is explained in classical writing by Thomas Paine. Government is “a mode rendered necessary by the inability of moral virtue to govern the world.”(Paine, 1776). Paine goes on to make the point that “the more simple anything is, the less liable it is to be disordered, and the easier repaired when disordered”. Governance, then, can be stated to be, in the simplest form, a way of determining good and bad, or right and wrong.

There is a broad agreement that a settlement like a city will require some form of government for it to be sustainable (Paine 1776), helps to clarify how this position is arrived at). The form will vary, but the overall intention and desired outcome - to give structure and order - is broadly the same.

Among more modern scholars, these early thoughts find a lot of resonance. Critchley (2012) reflects on the issues raised by Mumford and concludes that his key concern is a moral order of the city.

2.2.2.2 Historical Dimension to Urban Governance

The development of the form of governance for the urban settlement can be traced as far back as the early Babylonian cities. King Hammurabi, who reigned between 1792 to 1750 BC is famously credited with developing a code to inform the relationships within Babylon. (Bradley,2020)

The code of Ur-Nammu predates Hammurabi by about 300 years. The whole system of cuneiform law, was focussed on the cities among the Sumerians, Babylonians, Assyrians, Elamites, Hurrians, Kassites and Hittites. King Hammurabi's was the best known among them. (Bradley,2020).

The main lesson garnered from the examination of these systems is the need of a hierarchy in instituting a governance system. Whereas rules may be developed, involving the population and reflecting their values, a superstructure is required to enforce them. This profile of the urban governance is the characterising aspect of the urban systems in the middle ages of Europe.

In other jurisdictions, the basic characteristics of a hierarchy remains even when the broad profile is dramatically different. An example of a different system is provided by the examination of the Sokoto caliphate in Nigeria which thrived in the nineteenth century. Within this broad government, the city of Kano has its own emirate and its own government. (Overy [ed] 2015) The superstructure in the governance structure may take on a degree of complexity in varied circumstances and it does not always translate to a political system. At different times in varied places, the leadership is provided by political players, business people, religious leaders, academics, etc.

Ultimately, governance is about making decisions within a society and creating the mechanisms of enforcing them. The governing entity is given form by the commonality of the problems. (Bevir, 2012) By this logic we can see that urban forms which share an experience – and a set of problems -distinct from the rural areas, would arrive at the need for creating a governing entity focused on the urban area.

The need to create the governance structures connects the politics of a city to its existential purpose; its ability to meet primordial desires, to nurture life in its most basic form and to facilitate cultural needs. This forms a critical basis in the further discussion of regulation and its nature within the urban environment.

2.2.2.3 Urban Resilience in the Context of Governance

This linkage between politics and the existential purpose of the city, provides a crucial connection to the construct of resilience. By definition, resilience is determined to be the ability to recover after traumatic events or the ability to avoid such events. (Rodin, 2015)

An important part of the understanding is the meaning of the disruption. What exactly is disrupted?

Definitions of resilience vary widely, partly as a consequence of the multiplicity of disciplines that are focused on the issue, and partly due to the different interpretations of disasters. It is however generally accepted that cities are fairly tenacious with only very few cities ever getting to be entirely abandoned. Cities do however suffer catastrophic disruptions quite often. The risk is always high that something may come in to introduce such disruption.

2.2.2.4. Summary

What we have established above is that cities as human institutions, are critical for the human race and their efficient workings are guarantors of good quality of life for the race. This viewpoint in an ideal situation would be reposed in each individual, so that in their actions and interactions, each person lives with the consciousness of the critical role the city plays. In this postulation, it is

necessary to recognize that the most persuasive arguments have been developed by a set of scholars mainly writing in the sixties. Lewis Mumford publication of "the City in History" in 1961, stands out as a powerful expression of the essence of the city and reinforces the idea of the city as an institution with existential value.

An alternative view offered in the literature on the nature of the city, considers economic dynamics as a central driving force. The ultimate justification from this point of view is the need to take advantage of economies of scale. (O'Sullivan, 1996).

2.3 The Industrial Cities

Whereas the city form can be traced back to antiquity, the beginning of industrial development within society gave a significant and defining impetus to the growth of the city form that we have today. There was an accelerated growth in settlement, with populations migrating to serve the new industries and thus creating settlements and relationships, on a scale that was new. The city form was now a complex set of relationships, with complementarity and tension. This movement created new problems arising from the form of the city and resulted in crisis.

As much as these studies have been able to shed great light on how cities emerged and the basic qualities of their survival, they do not anticipate the impact of a more complex society and the development of new understandings. During the industrial revolution, the resolution of the urban crisis focussed on getting good hygiene and ensuring the good health of the population. This arose out of the rapid concentration of populations near the new work centres, a phenomenon that introduced new dynamics.

The most consequential period in the development of the urban form happened during the industrial revolution. The rapid increase in the size of urban centres during the early parts of the 19th century, provided an intense examination of the viability of the city form.

The industrial city brought out vividly some of the problems that this form of settlement would create. An illustration of this form was brought out by Friedrich Engels (1872) who describe the general state of filth that obtained in these towns. Debris and refuse characterised the public areas and the air was filled with stench. The descriptions of the industrial cities in the early parts of the 19th century illustration, not only highlights spaces that could not support life, but in fact which were themselves becoming a threat to life. The pollution of the land through refuse, the pollution of the air and of the water became the main challenges of these settlements.

Engels contributed significantly to the understanding of these problems and his paper, "The Condition of the Working Class in England in 1844" was highly influential. It was becoming clear that the urban form or the town was creating conditions that were detrimental to healthy living.

2.3.1 The Modern Conceptualisation

Discourse about the city form have continued to engage the relevant disciplines throughout the 20th century and have helped advance the reaction to a developing global scene and the issues that have been brought forth.

The period of the early 20th century is one that offered powerful thinking led by prominent architects of the day. The focus was on the Functional City as the ideal and emphasised mathematical approaches in the planning. (Le Corbusier,1967 Gedion,2009). The Athens Charter, which was the outcome of the conference in 1933 but published ten years later in 1943 by the architect Le Corbusier, summarises broadly the focus on functionality as the central viewpoint from the leading thinkers. (Corbusier, 1973).

An inflection point however is noticeable around the early 1960 when new thinking started to bring forward different conceptualisations of the city. A renewed focus on the place of the people was a natural reaction to the dominance of the car and its accommodation in the planning of cities.

Security and crime were new concerns requiring a concern for the shared space. (Jacobs,1961 Newman,1973).

In summary, the consistent message in the literature that takes a broad sweep of history, is that the city is fundamentally about the sustenance of life. In its origins and in the structuring, the city is geared toward providing the environment to sustain human existence and to allow for the development of society.

2.4 Vulnerability of the City Form

The city form in history has continuously battled with risks and vulnerabilities that threaten its capacity to support life. These risks are part of the development process of the urban settlements (Pelling,2003). In this section of the study, the intention is to trace the stresses on urban form and how they have been understood over time. It is expected that this will form a foundation into understanding how the regime of governance is developed.

The process of developing a form of governance for the urban settlement can be traced as far back as the early Babylonian cities. Among the earliest attempts at a code of conduct in the cities, the code of King Hammurabi is often cited. He reigned in Babylon - current day Iraq - between 1792 to 1750 BC. King Hammurabi, developed a code which is widely cited as an early example of this kind of governance.

The code of Ur-Nammu predates Hammurabi by about 300 years and is the most ancient known. The whole system of cuneiform law, was focussed on the cities among the Sumerians, Babylonians, Assyrians, Elamites, Hurrians, Kassites and Hittites. King Hammurabi's was the best known among them.(Mumford,1961; Britannica, 2011)

Hammurabi's laws were simple in their construction, and can be summarised as basically "an eye for an eye". (Mumford,1961). A few examples of these laws are cited below:

Law 56:

- If a man let in the water, and the water overflow the plantation of his neighbour, he shall pay ten gur of corn for every ten gan of land.

Laws 229 -233:

- If a builder build a house for someone, and does not construct it properly, and the house which he built fall in and kill its owner, then that builder shall be put to death.
- If it kill the son of the owner the son of that builder shall be put to death.
- If it kill a slave of the owner, then he shall pay slave for slave to the owner of the house.
- If it ruin goods, he shall make compensation for all that has been ruined, and inasmuch as he did not construct properly this house which he built and it fell, he shall re-erect the house from his own means.
- If a builder build a house for someone, even though he has not yet completed it; if then the walls seem toppling, the builder must make the walls solid from his own means. (Hooker, 1996)

These laws focussed on what was seen as priority areas for the society. They sought to mitigate negativities on the oppressed and prevent the miscarriage of justice. The remedies they prescribed applied the principle of retributive justice (Roth,1995; Slanski,2012) and provided a “general maxim” in the pursuit of justice (Fish,2008).

The enforcement of these rules required a hierarchy in a governance system. Whereas rules may be developed, involving the population and reflecting their values, a superstructure is required to enforce them. This profile of the urban governance is the characterising aspect of the urban systems in the middle ages of Europe.

The studies into the “Great Fire of London” of 1666 offer further insight into the problems confronting the city in a subsequent period and provides evidence that governance action was

necessary to protect the city. This particular fire delivered a traumatic blow to the city of London (pop about 400,000 then), razing down more than 30,000 houses and public institutions like churches and prisons. It led to the need to institute order and structure on the city in order that it deliver a more lovable city (Hanson, 1989).

The reaction to this fire is a pointer to the conventional wisdom of the day on the nature of relationships within the city. Several laws were passed to lay down the guidelines for the populations on how to rebuild. Among the most significant aspects of these were the dictates on allowable materials that generally focussed on preventing widespread use of flammable materials.

The First Rebuilding Act (1667), the Second Rebuilding Act (1670) and the Building Regulations Order collectively sought to lay down a framework to protect the city against such an occurrence in future.

Among the critical areas the laws sought to regulate were the use of materials, the limitation of density to prevent overcrowding, and the revival of the guilds of specialised artisans in the construction trades. These rules also indicated the need for supervision by public authorities of private work.

The significance of the great Fire of London is that it called into action the public sector (Marmot and Worthington, 1986). The broad framework of how the city could be improved was laid through parliamentary rebuilding acts and proclamations. This was understood to contribute to a “well structured and therefore liveable urban spaces” (Marmot and Worthington, 1986; Hanson,1989).

This growing appreciation of how different relationships and complexity of decision making affects the quality of life was severely put to the test by the rise of the industrial revolution cities at the end of the eighteenth and the beginning of the nineteenth centuries.

The identification of the problems that were causing towns and cities to become dispiriting living environments was a long and laboured process. The advent of industrial activities in the nineteenth

century meant that urban areas grew at a very high rate. Annual population increases in the urban areas were averaging 2.5% and in many cases were higher getting close to 6% in some cases (Williamson, 1984). The conditions that arose from the resultant settlements were creating concerns in some quarters as captured in the seminal publication by Frederick Engels, *Condition of the Working Class in England* written in 1844.

It is the health problems- especially the cause of diseases like cholera and typhoid- that became the focus of these efforts. The process leading to a consensus about what should be done was riddled with conflicting viewpoints and featured extremely partisan views. This process however birthed the framework of urban governance, creating a clear focus and identifying the priority areas.

The issue at hand was the actions required to create an environment free of the challenges of sanitation that had engulfed the cities. (Hamlin 1998). We take note of the efforts on Edwin Chadwick who structured an intervention that established a role for the government in determining how each member of the population would conduct themselves. In this initial formulation, a crucial step was made to create a role for the local authority. This role envisaged such an authority as a crucial enforcer of a set of regulations guiding the construction process.

The mid-century period of the 19th century saw critical work that resulted in the creation of the first Public Health Act. The built up to this outcome featured major disruptions caused by widespread and regular outbreaks of disease.

In the responses crafted by Edwin Chadwick,(1864) we see a glimpse of the nature of governance required to remedy the situation.

The consensus positions that were developed in the resolution of this crisis were significant and proved to be critical milestones in the search for a stabilising mechanism in the welfare of cities. The most enduring of these factors was the creation of a role for government and a clarification of the nature of governance. (Morley, 2007) An intervention was structured that gave the government

the powers to determine how each member of the population would conduct themselves. In this initial formulation, a crucial step was made to create a role for the local authority. This role envisaged such an authority as a crucial enforcer of a set of regulations guiding the construction process.

The justifications offered for this role were:

i) The need to apply science to the resolution of common building practices

ii) The overall economy that makes savings by keeping people healthy.

Crucially, the solution offered to the sanitation crisis of the day required the laying of a common service - the drainage system - which became a model for other cities. (Morley, 2007).

The intervention was an important turning point for the society and a critical piece in the construct for governance in light of an existential challenge. It led the society to adopt a more sophisticated level of urban governance. There is broad acceptance now that sound urban governance holds the key to mitigating the stresses and vulnerabilities of the urban system (Lange, 2010).

The context for this conclusion is the wider understanding of urban governance. Harpham and Allison (2000) provide the broader context in their analysis of the dimensions of Urban governance. Four dimensions are cited namely a technical, a institutional, political and cultural dimensions.

In the elaboration of this construct, we see a vision of the nature of risks within the city.

The understanding of urban stress and vulnerabilities shifted with the growing sophistication of cities occasioned by the advent of new building materials and the inventions with urban impact like electricity and the motor car.

The Swiss architect Le Corbusier was an influential thinker on the city and its problems. His understanding of the city is articulated in his book the Radiant City. (Corbusier, 1933). In this work he identifies the problems of the city as lack of healthy living conditions, noise, traffic, playground

space, public transportation, etc. In an earlier work, he identifies poor design and inadequate housing as the issues that are problematic in the city.

In proposing for improvement strategies, for the quality of urban environments, Le Corbusier is attracted more to the relationship with nature. Urban space is seen to gradually become one with the landscape. This connection is seen to provide the path to greater well-being of the city. In the proposals for the Broadacre city by Frank Lloyd Wright (Nelson, 1995), and the Radiant City (Le Corbusier,1933) this viewpoint is further clarified and articulated. Greater intensity is brought to this question at another stage in the growth of cities. (Gedion, 1944).

Continued growth in the complexity and sizes of cities, brought new understandings of the vulnerabilities and stresses involved. There is a growing concern for the quality of planning and the philosophy that guides such planning and this is seen to affect the quality of social and economic life in the city. (Jacobs,1961: Newman, 1993). It is the actions of planners and policy makers that are seen to shape the city and guarantee its quality. Jacobs in her influential book *The Death and Life of Great American Cities*, laments the impersonal relations that develop.

Growing complexity of urban systems has brought to the fore new concerns about the welfare of these systems. New issues have been highlighted that point to areas of vulnerability and possible strain of the urban systems. This development can be expected given the complexity of relationships that would lead to be in place for the system to work. Among the new areas that are identified as sources of stress are issues like crime, social delinquency, traffic, housing and vulnerability to traumatic events.

From this brief survey we see that concern with these issues give impetus to scholarship that brought a new understanding on the subject of urbanism. This line of scholarship can be characterised as overarching, seeking to develop a broad picture understanding on the nature of the city form.

In more recent times the quality of life that the city delivers has become a matter of interest for scholars. Scholarship directed at how it is delivers this quality to its citizens has been on the increase. Is this way we have seen heightened focus on issues like walkability, public space and it's quality, the nature of social space and mobility within the urban system. (Speck,2013; Gehl,2013; Rose,2017)

Other critical contributors to this understanding include discussions on social justice within the city (Harvey, 2009) and interconnection that arising and characterize city living (Castells, 2009). Discussion on how to enriched the relationships within the population inform the writing of Richard Florida, Charles Landry and Leonie Sandercock. (Florida,2019; Landry,2008; Sandercock, 2003). This focus has helped develop a richer undertaking of the dynamics of the city and its capacity to nurture life.

The fundamental point that titrates from these studies is the critical role that members of a community can play in enhancing the lives of all, and the need to keep an eye on the big picture dynamics. These perspectives underline the role of managers but do not get into the mechanics of how this is achieved.

From the studies reviewed, one can conclude that the understanding of the stresses on the urban system is cumulative and each new highlight adds on to what we already know. None of the issues that have been identified in any time period diminish in their importance to the system. There indeed is the inherent need to keep a watch on all these sources of stress in order that proper management can be applied and improved over time.

Interest in the basic issues of building regulation and the management of fundamental public health has not diminished. More focus has been placed on the process of enforcement. (Heijden, 2009) There has also been effort to add clarification of the basic rules for better communication but also for the application of this framework of a code to broader issues like disaster management and site

organization (Productivity Commission,2004) The secondary purposes of the existence of codes, as identified by the Australia Building Codes Board, which have to do with education, minimum standards and the appreciation of growing science; have also informed the efforts that are geared towards improvement of the building regulations.

2.5 The Significance of a Building Code

The idea of a code enforced by government continues to this day and is still a key principle that guides urban governance. However, broad concepts of governance, notably the nature of democracy, have brought out additional dimensions of determining right and wrong in society. Democracy seeks to give every citizen a role in their own lives. In this respect, there has indeed been a growing dynamic pushing for less and less government in peoples lives. The tension between a centralized source of authority and a more liberal concept of responsibilities is a preoccupation of some political scientists. Francis Fukuyama has observed the following in playing 'infrastructural' against "despotic" power:

> The reason I am excluding democratic accountability from the definition of governance is that we will later want to be able to theorize the relationship between governance and democracy. The current orthodoxy in the development community is that democracy and good governance are mutually supportive. I would argue that this is more of a theory than an empirically demonstrated fact, and that we cannot empirically demonstrate the connection if we define one to include the other. (Fukuyama, 2013,p2-3)

The nature of the space for actions left for the citizen in a city is of vital concern since it relates directly to the biological urge to shape shelter. In this respect, rules and laws would tend to an equilibrium that supports the primordial urge to be involved in shelter making. This remains an underlying concern in all attempts at regulation of action.

2.4.2 Conclusions

It is this need to create the governance structures that connects the politics of a city to its existential purpose; its ability to meet primordial desires, to nurture life in its most basic form and to facilitate

cultural needs. This forms a critical basis in the further discussion of regulation and its nature within the urban environment.

There is an inherent connection between the structure and the tools of governance, on one hand, and the quality of life and the ability of the city to nurture life, on the other. The specifics, which include the manner of formulation of the rules and regulations, of this quality have not be elucidated. The literature on this matter as discussed in this section exposes this gap, and further reinforces the justification for this study.

However, no studies that directly connect the tools of governance to the desire to create an outlook within the population have been located. It is highly likely that there exists a gap in the understanding of the mechanics through which the public get involved in the process of creating this bigger picture. The system of values that would underpin this dynamic has not been highlighted or studied with depth.

2.6. Urban Resilience

2.6.1 The Fundamentals of Urban Resilience

Urban resilience has to be seen as a subset of a much broader concept of resilience. The term resilience has only come into the lexicon of urban studies in recent times. In fact resilience is seen as encompassing a wider spectrum of issues.

The simple dictionary definition of resilience is “the capacity to recover quickly from difficulties; toughness”. Alternatively it is “the ability of a substance or object to spring back into shape; elasticity.” (Oxford Dictionary). The Miriam-Webster dictionary defines resilience as” the capability of a strained body to recover its size and shape after deformation caused especially by compressive stress or an ability to recover from or adjust easily to misfortune or change.”

Resilience has also been defined as the capacity of any entity -an individual, a community, an organisation , or a natural system — to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience. (Rodin, 2015). Also resilience is the capacity of a system to absorb disturbance and still retain its basic function and structure. (Walker and Salt, 2006).

The concept finds easy appropriation by various strands of knowledge. Whether it is in the social sciences or in other applied studies, resilience is a concept that is easily adapted to explain phenomena and to frame the inquiries about such phenomena. This concept has been appropriated in the world of medicine, in sociology, engineering, and in government generally.

The concept of Urban resilience springs from this broader outlook. We appropriate this concept to relate to the overall health of a urban settlement and its capacity to recover that health after disruption. Rodin (2015) has also argued that resilience is the development of the capacity to bounce back and learn from crisis. What has been called the *resilience dividend* is this fortifying capacity that helps build greater and greater capacity to manage disruption (Rodin, 2015). The idea of the health of an urban settlement in the main would relate to the ability of this entity to perform the function for which it was created.

Table 2.1: The Five Characteristics of Resilience

THE FIVE CHARACTERISTICS OF RESILIENCE	
AWARE	The entity has knowledge of its strengths and assets, liabilities and vulnerabilities, and the threats and risks it faces. Being aware includes situational awareness: the ability and willingness to constantly assess, take in new information, and adjust understanding in real time.

DIVERSE	The entity has different sources of capacity so it can successfully operate even when elements of that capacity are challenged: there are redundant elements or assets. The entity possesses or can draw upon a range of capabilities, ideas, information sources, technical elements, people or groups.
INTEGRATED	The entity has coordination of functions and actions across systems, including the ability to bring together disparate ideas and elements, work collaboratively across elements, develop cohesive solutions, and coordinate actions. Information is shared and communication is transparent.
SELF-REGULATING	The entity can regulate itself in ways that enable it to deal with anomalous situations and disruptions without extreme malfunction or catastrophic collapse. Cascading disruptions do not result when the entity suffers a severe dysfunction; it can fail safely.
ADAPTIVE	The entity has the capacity to adjust to changing circumstances by developing new plans, taking new actions, or modifying behaviors. The entity is flexible: it has the ability to apply existing resources to new purposes or for one element to take on multiple roles.
Source: Rodin, J., (2015) The Resilience Dividend, P23	

Urban risk and resilience has been defined in different ways by different people. Fundamentally it is recognised as a complex dynamic, an outcome of a myriad of feedback loops and thresholds and competing ideas, mechanisms and forms. (Norgaard, 1994). Urban resilience is a proactive stance towards risk (Pelling,2003) suggesting that it is a quality arrived at through conscious and deliberate action. This is a critical observation underlining the fact that resilience is not a natural conditions and does not exist as a natural phenomenon.

The concept of urban resilience can further be broken down along the lines of the dynamics that drive urban systems. Four key areas that constitute urban resilience according to The Resilience Group are the metabolism of the city capturing the production, supply and consumption chains; the

Governance networks manifested in institutional structures and organisations; Social dynamics, in the demographics, human capital and inequity; and the built environment capturing the ecosystem services and the urban landscape. (CSIRO 2007).

In this study our interest remains with the governance aspect which is identified as a key part of urban resilience. The CSIRO deconstruction of governance sees institutions and organisations as the manifestation of governance. Urban governance is broken down to five dimensions: (1) capacity to provide adequate service, (2) ability to raise and manage sufficient financial revenue, (3) skill to deal with issues of urban diversity, fragmentation and inequality; (4) capacity to respond to rising urban security threats, and (5) the increasing complexity of authority and managing across jurisdictions.

The process of governance involves tools and instruments. Through these, public purposes are pursued. Tools may include the assignment of responsibilities, the structuring of institutions and, information and evaluation (Salamon 2002)

Commonly distinguished policy instruments include, legislative /regulatory instruments, economic/ fiscal instruments, agreement based/co-operative instruments, and (traditional) information/ communication based instruments. Additionally, there are knowledge instruments. (Vedung, 1998; Jordan and Adelle, 2014).

Laws and regulations are the everyday manifestation of the legislative and regulatory instruments. They all seek to compel the citizens to act in a particular manner and are binding on the citizens, with sanctions applying on non-compliance. in influencing actors behaviour, government applies a command and control approach to either forbid certain behaviour (prohibition) or require it (prescription) (Bouwma, et al., 2015)

The nexus of urban resilience that culminates in the nature of regulations and laws provides the basis to investigate cause and effect, an object of this study.

2.6.2 The Urban Landscape

In the disaggregation of the concept of urban resilience, a major component is the built environment which incorporates the urbanscape and the ecosystem that accommodates the settlement. In the main, this highlights the necessary coexistence - between the natural terrain and the man made structures - that is inherent in the physical location of the urban settlement. The spatial organisation of the urban settlement , entailing the location of infrastructure affects the use patterns of the space. (Garmestani, et al., 2005). An understanding of the dynamics of the urban ecosystem will shed light in how they contribute to building urban resilience. (Research Alliance,2012).

On a higher level, the relationship of the city to its physical location can be seen as a phenomenon that gather the spirit of place and expresses it in the character of the city Norberg-(Schulz, 1980). This examination of the relationship of location and meaning draws from Heidegger's (1971) essay "Building, Dwelling, Thinking" and its focus on the creation of 'places' as the spaces where life occurs. (Norberg-Schulz, 1980, Strecker, 2000).

The processes through which this delicate relationship can be upset to the detriment of the city and its occupants, raise questions about the necessary mitigation measures. The preservation of this balance is a contributor to the resilience of the settlement and its abilities to continue nurturing life. This envisages the need to understand better the necessary strictures needed to control human activity that may create vulnerabilities and harm the balance.

Whereas urban resilience may be built to a large extent on the physical aspects and other intangible networks, it is also clear that ultimately it is about the people who are living there and the life that they are living. The physical aspect of resilience begins with the accommodation of the natural terrain.

The natural terrain upon which the city is built has a big bearing on the quality of life and the quality of environment that results the connection that the city makes with the physical environment

becomes a major source of the character of the settlement. Christian Norbert- Schulz (1980) discusses the phenomenology of architecture and the underlying spirit of a place, and makes the connection between that spirit and the physical context of the city.

It is possible to see the city from this construct as superstructure that consists of the human life and the relationships that people have established, and at another level, a sub structure that allows for this life to happen. This substructure must be seen to constitute of the physical manifestation of the city including relationships with nature and with the terrain. Some sources in the literature make this distinction. In that link, we see the city both as the physical manifestation, and as the life that is a lived within this physical entity.

The critical observation at this stage would emphasize that both entities are dynamic and none is static. Each of them is changing and adapting to situations that are geared toward better support of life. This capacity can be demeaned or devalued through the deterioration of the physical entity or through the deterioration of the human relationships within the population.

In referencing the resilience of the city one must confront the two phenomena: the ability of the physical environment to continue sustaining life and the human relationships to continue avoiding unnecessary cooperation and sharing that is key to the performance of the urban settlement.

It behooves on us to examine some of their issues that have been raised in the literature relating to some of the aspects of urban resilience from those two dimensions. In this study there will be a hierarchy of relevance since not everything may relate to the aspect of regulation.

A question exists about the metabolism of the city. This relates to the process through which a city gets the inputs it needs for daily life. Whether it be the food that has to be supplied or the fuel sources that have to be brought into the city, the question of efficiency and reliability is a critical part of the cities continued ability to support life. Urban metabolism does indeed relate to a wide spectrum of issues from the food and fuel, to the movement of labor, the supply of medical facilities

and the supply of other goods including the luxury goods that are needed for living. This aspect of a life is supported by networks that work to deliver this in many cases within the framework of trade and commerce. It may be noted however that some of these are absolutely critical elements and therefore would need to be almost guaranteed for the city in order for life to be sustained.

Above we have discussed that metabolism of the urban settlement as a key aspect of resilience of the city. There is an obligation to make the connection between the flow of supplies and the physical expression of the points of exchange. They need to be not just points of exchange but also points of contact, i.e. social places. (Tomlinson and Planas, 2018)

The other major aspect of the resilience of the city is the kind of relationships that exist between the various players in the normal operations of the entity. The strength of the social infrastructure that supports human interactions and the dynamics of community buildings are important dimensions in the overall health of the living environment.

2.6.3 Nurturing Resilience

In the foregoing survey it is clear that resilience is a condition that is a result of human activity and human decisions. Our task in this study is to establish the nature of this human intervention that will reinforce the capacity of the city to continue to support life and to be able to withstand shocks to the system that are likely to happen every so often. Such interventions could be reactive to situations that arise, or they may be more anticipatory to situations that may emerge and thus be more systemic. It is in the later scenario we would expect that policymaking and structural arrangements would be the more reliable of responses.

From the historical survey quoted earlier it is clear that legal arrangements needed to be put in place in order for the settlement to survive during the industrial revolution. In more recent times we have seen that it is necessary for similar arrangements to be in place in order for the urban settlement to be in tandem with environmental health.

At the core of the governance structure is the need to introduce a measure of predictability in how citizens will act when they have to in their daily activities that contribute to the overall health of the city. Governance interventions, in the form of laws and regulations therefore have this objective at their core; to control and ensure that what activities are carried out do not impinge or threaten the overall health of the settlement.

The historical development of an urban settlement reinforces the need for governance as a critical factor is the continued survival of the city. This is the inevitable conclusion from the historical survey of city development over the last two hundred years. Whereas this has been easy to illustrate through the examination of the industrial revolution city, it is notable that at no point has the urban settlement not relied on robust governance systems. This, evidently is a consistent aspect in the growth of the urban culture around the world. Inevitably a tension exists at the core of the governance systems since there is a need to balance between what is the individual room of freedom, and what would be of broader concern to the community. In later days this has come to be expanded to the consideration of the interests of future generations which is indeed the critical outlook underlying the concern with *sustainability*.

It emerges therefore that in the overall goal of creating a natural resilience of a better settlement, the governance system lies on the critical path to that objective. The goal in the government system is predictability and the controls on what actions may be taken in the process of satisfying individual needs and maintaining the broader interests of the society. How this governance is structured and the strictures that are then communicated to citizens constitute a critical part of the success of the efforts to ensure the strength of the settlement.

2.6.4 Summary

Urban resilience is now the subject of scholarly concern from different dimensions. We are able to establish from the literature that resilience results from human decisions and actions and is thus

attainable through the agency of the population. (Rodin,2015; Walker and Salt,2006). The essential nature of this agency is contained in the notion of "situational awareness" (Rodin,2015). (See Table 2.2.) As defined, situational awareness includes the ability and willingness to make assessment and adjust understanding. Further, adaptivity qualities allow for flexibility.

These qualities in the ideal situation are reposed -in an active sense- in the people themselves. In this study, that line of enquiry in embedded in the objectives: to interrogate the stated regulations for a direction that leads to the essential qualities of a resilient community.

2.7 Urban Governance

What we seek to do in this section is to explore the whole concept of governance within urban areas. This means that we need to look at the philosophy that underlies regulations and the justification offered for seeking to control the actions of human beings within the urban environment.

2.7.1 The Concept of Governance

Governance has been defined as all processes of governing, whether undertaken by a government, market, or network, whether over a family, tribe, formal or informal organization, or territory, and whether through laws, norms, power or language. Governance differs from government in that it focuses less on the state and its institutions and more on social practices and activities. (Mark, 2012).

Urban governance concerns itself with how decisions that affect the welfare of city residents are arrived at. It influences the way in which citizens can participate in the shaping of their lives, how they can benefit and the process that will bring positive outcomes for all. (Avis, 2016) Governance aims to deliver benefits that impact directly on inhabitants lives including improved health, safety and social development, saving them, as it were, from poverty, inequality and conflict. (Avis, 2016).

It is suggested that governance is a continuing process and will incorporate both formal and informal mechanisms. (UN-Habitat, 2023).

Urban governance has developed in reach and complexity across history. Above, we have cited the ancient examples of Hammurabi's code of governance in Babylon and later the interventions of authorities in the calamities afflicting cities in the middle ages. In the industrial revolution and especially in the introduction of the Public health strictures, governance takes a big leap and becomes a critical part of the way cities are conceptualised.

Governance deals with public problems. The process involves an array of tools and instruments which include , among others, social regulation, economic regulations, contracts, insurance, etc. (Salamon,2002; Devas, et al., 2004). A crucial distinction is made between "government" and "governance" with the later suggesting that there is a collaborative aspect in the way government should address public problems and public purposes. (Salamon, 2002). Outcomes in urban governance depend on the relationship between the various actors and institutions (UNESCAP & UN-Habitat, 2010) .

According to Slack and Côté (2014:7),urban governance plays a critical role in shaping the physical and social character of urban regions; influences the quantity and quality of local services and efficiency of delivery; determines the sharing of costs and distribution of resources among different groups; and affects residents' ability to access local government and engage in decision-making, influencing local government accountability and responsiveness to citizen demands.

The twentieth century was a time of great developments in this regard. The long winded reactions to the crisis created by the rise of the industrial cities not only found a defined role for government and local authorities, but also clarified vividly what the critical concerns were. Above all, issues of public health and the safety of inhabitants were of primary concern.

2.6.2 The Necessary Balance in Governance

In the discussion about governance, a spotlight placed on *good* governance has emerged to suggest that there are certain standards of practice that need to guide urban governance. The UN-HABITAT interprets this to mean guaranteed rights for the citizen that every person may enjoy the benefits of urban citizenship. (UN-HABITAT,2003). This however is stated in broad terms and no real specifics are offered on how this can be attained.

According to the UN-HABITAT, the key principle that characterises good governance is the link to the welfare of the citizenry. Ultimately, good governance is characterised as that which will protect the dignity of the citizenry and facilitate their full participation in the life of the city and in the process, improve their social and economic conditions. (UN-HABITAT, 2003).

Seven principles have been identified as characterising good governance: These are:

- sustainability: balancing social, economic and environmental needs for present/future generations;
- subsidiarity: taking decisions at the lowest appropriate level of government;
- equity or inclusiveness: level of participation in decision-making and access to basic services;
- efficiency: in service delivery and promoting local economic development;
- transparency and accountability: of decisions;
- civic engagement: of citizens; and
- security of individuals and their living environment

Table 2.2 Factors discerned from the Sendai Framework on Disaster Reduction	
Issue	***The Framing in the Sendai Construct***
Responsibility	*Each **State** has the primary responsibility* to prevent and reduce disaster risk, including through international, regional, subregional, transboundary and bilateral cooperation.
Thrust of Advocacy	Managing the risk of disasters is aimed *at protecting persons and their property, health, livelihoods and productive assets*, as well *as cultural and environmental assets*
Inclusivity	*a clear articulation of responsibilities across public and private stakeholders, including business and academia,*
Comportment	and *local communities to reduce disaster risk, including through resources, incentives and decision-making responsibilities…*
Educational	(30(c)) *including the use of the principles of universal design and the standardization of building materials; retrofitting and rebuilding; nurturing a culture of maintenance; and taking into account economic, social, structural, technological and environmental impact assessments;*
Advocacy	(f) it is necessary to empower local authorities and *local communities to reduce disaster risk, including through resources, incentives and decision-making responsibilities,*
Source: Author	

This characterisation of significant and important. By using such a fundamental metric like dignity to indicate best practise, it is envisaged that the tools of governance can be tested for this quality to discover their effectiveness. The characterisation also points to the existence of higher purpose in the formulation and communication of the tools of governance.

In this respect, bad governance is seen to represent oppressive regulation especially of informal enterprises and settlements (Devas, et al 2004). The thrust in these studies of governance, emphasise the rights of citizens and focus on inclusion and the welfare of the disadvantaged. (Brown, 2015)

This gives us a measure for the effectiveness of building regulations to link to the fundamental purposes in life. Urban settlement is an act of compromise that brings together a huge number of people into a small physical space and therefore forces them into necessary sharing of many aspects of their lives. The very nature of the dynamic of sharing will require setting ground rules to be in place for it to be effective. This may be seen to address the possibility of conflict relating out of competition for the scarce resource that space is.

On the other hand, and possibly as a counter to the above, there is the positive possibility cooperation for the economies of scale. They economies of scale can be demonstrated through the provision of services like water supply or access roads which would be difficult for a single person to address. The economies of scale allow for the possibility of superior services to be provided to a large number of people easily. Therefore there is clearly an incentive and a need for cooperation within the urban a settlement in order that a higher quality of life can be achieved.

Immediately therefore we see two sides of the governance question: on the one side is the need to protect personal liberties or freedoms to allow every person to enjoy what they are entitled to as human beings, and on the other side to harness the benefits to society that are inherent in the proximity afforded by urban settlement.

An additional and significant dimension is added through consideration of the dynamics of sharing. The interface between the shared public realm and private interests is regulated and facilitated by good governance and collective civic structures (McLaren and Agyeman, 2015). This underpins the concept of sharing as a driving and organising force in cities. This alludes to the notion of “just sustainability” (McLaren and Agyeman, 2015,) where the questions of social needs and welfare are integrally related to the environmental ecosystem.

As in other aspects of human life the actions that are taken that impact on populations required to be properly justified in order that they are not abused and do not become inadvertently the source of

impositions and unwarranted control. The justification for the regulation are to be found in broad philosophical positions taken to explain or expound on the interventions on human life. Here we look at various sources have looked at the theory of legislation and provided an understanding of how this can be effectively applied to our daily lives.

Within the architectural setting we recognise that there is a need to protect the space available for innovation and for design solutions that may not have been foreseen. Regulation would be seen to have a negative impact if it were to curtail the space for new thinking to emerge.

There would be further considerations for the direction of regulation. Among these are those conditions that arise out of the asymmetry of information between the creators of buildings and the uses of the same. This informs the approach that would have to be taken in order to ensure that buildings are safe for people to occupy, and that they are healthy. There are many variables that would impact on the safety of buildings and also on the interactions between peace and human health. Given therefore that the users of buildings would not be in a position to judge for themselves on the matters of safety and health – on account of this being a technical matter that needs a degree of education in the nature of the process of construction - the room then exists for authorities to intervene and ensure that they can guarantee for all their safety of buildings .

A further need for regulation arises out of considerations for human dignity. It is the desire that all buildings and the spaces that are formulated for human use will abide with basic human posture and movement and the overall protection of the dignity of human being. This area provides great variability in that there are many ways that the built environment can undermine human dignity. In the statement by authorities relating to the objectives of the formulations of the building regulations, statement is normally included that utility or convenience is a desired goal. The inevitable outcome therefore is the need to regulate in order to protect human dignity.

2.8 The Nexus of Urban Governance and Urban Resilience: A Theoretical Framework

The research question in this work seeks to investigate how individual action, in the act of building construction, can be guided and structured to make a positive contribution to the overall quality and security of our settlement and thereby contribute to the resilience of the life sustaining characteristics of the city..

The quality of an urban settlement is the sum total of decisions made by individuals in the pursuit of their own gratification and accommodation of life. However, as argued above, urban settlement requires a good deal of sharing. Urban life comprises of shared physical space, a character of space, life sustaining infrastructure and a commonality of opportunities. This factor, of necessity introduces an aspect of harmonisation involving all the necessary negotiation and compromises that ensure a degree of equity and the enjoyment of the freedoms that each citizen is entitled to. Urban resilience ultimately pivots on the health of this interaction.

Urban governance seeks to secure the contribution of every individual to this common dynamic. Whereas “common good” is recognised as a valid justification for the creation of a regulatory regime, it is also recognised that the individual must retain the space and capacity to resolve their issues in the way that is appropriate and satisfying to them.

The protection of the individual ability to innovate and pursue their own self interest is an important part of the organization of community in the urban settlement. However as McLaren and Agyeman, (2015) has shown, the shared life is also a critical part of the organisation . The actions of individuals contribute to the common result and impact on the resultant environment. It emerges in effect that nudging behaviour change among individuals is the way to change norms and culture (McLaren and Agyeman,, *2015*). The import of this understanding goes to underline the need to protect common interest even as we leave intact the space available for individual actions, and also

to protect their natural resources which would need to remain healthy and available for future generations. To maintain this balance, an overarching theme is necessary that nudges the population to responsible action.

It is a fine balance indeed. On the one hand too much of individual room to act would lead to a situation where the common good is jeopardized. In this kind of a situation what suffers the most is quality of what is shared. When individuals have the room for unregulated action, the outcome it's very likely to tend towards a *tragedy of the commons*. Such a situation cannot long endure and in due course will create calamity for the entire settlement.

The flip side of this situation would have a tightly controlled situation where every action is subject to authoritative control. Standardisation would quickly set in and deny the city the vibrancy that would normally result from individual expressions. This indeed has been the outcome in efforts to create fairly centrally planned settlement.

2.9 Conclusion and the Gaps in Knowledge

The literature on urban governance makes clear the importance of the shared life in achieving an overall quality of life for society. There are pointers to the need to invest in the individual as a critical player in this scenario. More literature seems to be developing to support this notion and the impetus provided by the recognition of the work of Richard Thaler and later Elinor Ostrom in the award of the Nobel Prize for Economic Sciences in 2008 and 2009 respectively is crucial.

What has not been highlighted in the literature is the critical process of influencing or nudging individuals in a population to the right decisions for the good of all. Building regulations and other aspects of guidance in society play this role. By placing a focus on how the regulations achieve this, we are helping fill this gap in understanding.

This research acknowledges the efforts by other scholars along similar lines. The work of Richard Thaler (2008) especially in his publication *Nudge,* addresses the same gap. This research however

focuses its efforts to the process of building and the role of building regulations. No similar work has been detected in the literature.

2.10 Building a Conceptual Framework

The main purpose for building a conceptual framework is to clarify what the anticipated content of the regulations should be. From the available material the research is looking at signals and triggers which indicate how the regulations are positioned in order to bring out the most positive outcome from the population. In different language, one is looking for the embedded wisdom in the regulations. Such wisdom is the distillation of historical and received insights.

A critical source of wisdom is the historical development and especially the genesis of the building regulations. The regulations arose in a specific set of circumstances and therefore carry the spirit of the original formulators. As noted in the previous chapter, the regulations arose to save cities from the reckless and life threatening actions of individuals. This spirit must continue to inform the formulations of the rules today.

A secondary source of this wisdom is the insights of scholars who have covered this area, from different perspectives. The examination of city form by researchers like Mumford and Jacobs, elicit perspective that inform any understanding of such tools today. Out of these thinkers we see the emphasis that is placed in shared space as a critical part of the health of the city In these writings we also see the importance of positive attitudes by the citizens as a crucial part of the city health. (Jacobs,1961; Newman, 1973, Kostof,1992).

The exercise of unearthing implied meaning as a basis of action is to an extent the basis for the international conventions that have, as their focus, the risk reduction within cities. The most significant of these is the Sendai Framework for the Risk Reduction (UNISDR,2015) which built on two previous positions. This framework represents the consensus on how risk reduction can be achieved in cities and is therefore a critical guidance for the formulation of building regulations. A

study of is recommendations is thus undertaken as part of this research and helps inform the resultant framework.

2.10.1 Sources of the Conceptual Framework

Four strands have contributed in the main to the framework adopted for the analytical process:

2.10.1.1. Historical Developments of the Building Regulations.

The history of the building regulations reveals that their content and direction has been a matter of concern for a long time. It is within these historical developments that the structure of their embedded authority has been established through an iterative process. It is also within this development that the scope of the regulations has emerged. History also reveals the gravity of the situations that gave birth to the regulations and intimate that without them the very existence of society would be jeopardised.

Within this research it is clear that the development of building regulations has sought to protect certain critical aspects of the living and built environment. This research reveals that this historical link is a critical threshold for the objectives of the regulations without which the protection of society may not be fully ensured. It is with this realisation that this historical dimension becomes a critical factor of the framework that we must apply to look at current regulations.

2.10.1.2 International Conventions

There has been concerns about the development of the urban environment around the world springing from the recognition that a critical threshold for the human race has been crossed in recent times. For the first time in the history of the human race more people are living in the urban areas then anywhere else. (The United Nations placed a marker on the year 2006 as the point at which this threshold was crossed.) This situation is not going to be reversed and represents the future of the human race. With this in mind international conventions have been mounted to see how the risks arising from disasters can be reduced in urban areas. Some of these conventions have

already been mentioned in this study and the outcome is informative and helps guide our understanding of what measures should be incorporated in building regulations. The most recent of these conventions is the Sendai framework and it's outcomes inform the synthesis of analytical framework.

2.10.1.3. Scholarly Authorities on Regulation and Governance

The insights of scholars on the role on regulation and governance are relied upon to help reinforce the framework of analysis. Among these are anthologies on the theory of regulation and the nature of governance. (Salamon, 2002). Also considered are the findings of governance scholars, and also those who are looking directly at the process of regulation.(Heijden,2009; Harpham and Allison, 2000; ABCB, 2002).

The crucial work of scholars who have looked at broadly the spatial controls within an environment has also been taken into account. Among them are scholars who did the work in earlier days but who's insights continue to inform our understanding today. (Jacobs, 1961, Newman, 1973,)

2.10.1.4. Authorities on Resilience

There is a growing body of work relating to the nature of urban resilience. This is a subject that for similar reasons as mentioned above is gaining a lot of attention to try and understand better how cities work and how in an urbanising world, stability can be ensured within the city systems.

These authorities represent new thinking. It is only in recent times that subject of resilience has come to the fore as an area of academic research and within that, studies on how resilience is to be achieved is a specific area that continues to grow in attention and bring forth literature and understanding.

Among the key thinkers are authors whose works have been issued within the years of the twenty first century (Vale and Campanella, [eds] 2005; Walker and Salt, 2006; Rodin, 2015; The Resilience

Alliance, 2023; The Rockefeller Foundation) and who thus represent the culmination of a long process of thinking about the health of cities.

These four strands of the conceptual framework form the basis to further explore the content of the data available as detailed in the Methodology chapter, following. The rationale for this framework forms part of the research methodology and is presented within that context in the next chapter.

Chapter 3 **Methodology**

3.1. Introduction

It is the stated purpose of this research to examine the impact that building regulations have on the resilience of cities and urban areas. This goal is achieved through the examination and interrogation of the building regulations as publicly stated to unearth and interpret the embedded meanings that contribute to our understanding of this connection. The results of that process form the basis for further discussion to draw out the full meanings of the regulations.

This chapter provides an overview of the adopted research philosophy, the research design, research strategy, and the research methods. Further, the data sources, the techniques for handling the data and the analysis are also explained.

The research primarily focuses on the building regulations developed for Kenya, acknowledging their potential resemblance to regulations developed elsewhere due to the universal nature of buildings and urban systems. The findings of this study are expected to contribute to the theory of building regulation in urban settings, with potential applicability beyond Kenya.

3.2 Research Philosophy

This is an interpretative study. The material available to me has not been developed by researchers and was not explicitly meant to serve the subject matter of this study. A process of interrogating and interpreting the data was necessary to unearth embedded meaning. It is in this approach that the connection between the subjects of this research is made.

The interpretative paradigm as an approach on scholarly inquiry has now been widely accepted. Strong proponents of this approach have demonstrated its validity in contrast to the naturalistic and positivist approaches that are sometimes favoured in social science research.(Bevir,2018;)

Interpretative research approaches have come to broader acceptance as a distinct approach that offers unique strengths suitable for this study.

From the outset, the researcher is obligated to select a research paradigm that suits the concept under study. The choice of the interpretive approach has been arrived it by reflection on the nature of the study and looking at authorities in the areas of research methods. To arrive at this choice, there are important questions to be addressed at this stage. van Esch (2013) has suggested a formulation of such questions along these lines:

(i) What is the essence of the social phenomena under investigation?

(ii) Is the social phenomena created by human minds or is it part of reality and objective in nature?

(iii) What forms the basis of knowledge that corresponds to social reality and how best to capture and disseminate such knowledge?

(iv) What is the correlation between an individual and their environment? (van Esch, 2013)

Crotty (1998) in discussing constructivism identifies three assumptions which, on evaluation, are deemed relevant to this work:

1. Meaning are constructed by human beings as they engage with the world they are interpreting. Qualitative researchers tend to use open-ended questions so that participants can share their views.
2. Humans engage with their world and make sense of it based on their historical and social perspectives - we are all born into a world of meaning bestowed upon us by our culture. Thus qualitative researchers seek to understand the context or setting of the participants through visiting this context and gathering information personally. They also interpret what they find, an interpretation shaped by the researcher's own experiences and background.

3. The basic generation of meaning is always social, arising in and out of interaction with a human community. The process of qualitative research is largely inductive, with the inquirer generating meaning from the data collected in the field. (Crotty, 1998)

In a critical sense, we consider that the phenomena we are dealing with is the compelling power of the regulations, where such compulsion would include persuasion, nudging, outright direction, reward and punishment as necessary. It is a delicate study of how the documents of regulations seek to achieve a particular outcome without creating an overbearing and dictatorial attitude.

The phenomena we set out to study is one of craftiness in the guidance of a population. It is in order to unearth the embedded meaning and concerns of the regulations that an interpretive approach is favoured for this work.

3.3 Research Strategy

The research strategy employed in this study is qualitative, aligned with the interpretive approach. Qualitative research allows for exploration and understanding of the embedded meanings within the data, leveraging subjective interpretation and analysis. The focus is on unearthing the qualities and characteristics of the regulations, particularly through text analysis.

Qualitative research uses an interpretive and realistic approach towards its subject matter as well as an emphasis on the qualities of entities. (van Esch, 2013). Social phenomena may have multiple perspectives, with each of these perspectives potentially having equal validity. (Creswell,2007, Leddy and Ormrod, 2013; Guba & Lincoln, 1988). One goal of this approach is to reveal the nature of these multiple perspectives.

The nature of the subject of this study is a socially constructed reality. The inherent value about what matters and what is important in this case, is the sum total of historical developments, of the interaction over time between man and nature, the outcome of which is the regime of regulatory

codes we have today. It is a dynamic process and has no absolute end and no final truth. It is the product of an evolutionary process and will continue to evolve further.

In examining the statements of building regulation, what we study is a reality as we see it. The strengths and understandings of qualitative research are what underpins this approach.

3.3.1 Methods under Qualitative Research Strategy

Qualitative research offers several paths forward in the search for the meanings we are seeking in this study. The research design for the study follows from this understanding of the nature of the problem. The option available from qualitative research designs were considered in turn and their strengths and weakness in arriving at the sought after answers, were assessed.

One of the available options for the research design approaches is case study. The case study method would be strong in the understanding of one person or situation in great depth. The nature of this study however was not compatible with this outlook and needed to retain the opportunity to relate to the universal dimension of regulation. The case study method was therefore deemed to be unsatisfactory for this study.

Three other approaches that are common in qualitative research design namely, ethnography, phenomenological study and grounded theory study, were each considered in turn. The point of reference was the material to be analyzed and the research question guiding the study. An ethnography would have been useful if the research question was focused on the beliefs or the culture of a population. In this study that was not the focus and this particular approach was unlikely to help answer the research question.

In similar manner, the phenomenological study fell short as a possible option in the research design. The research question in this study relied in the main on the contents of the statements of regulations and did not need interview to get to the sought insights. A better approach was available.

The grounded theory approach was also considered. In a different formulation of the research question, this approach would have been useful especially if the question led to the collection of data in a natural setting. However, in this study, this was not the case. There are aspects of the study that suggest follow up areas of further research as part of the wider pursuit of insights into the phenomenon of regulations. These may find it useful to consider the grounded theory approach.

3.3.2 The nature of the study

In reference to this framework, an interrogation into the nature of the current study is necessary.

The formulation of building regulations through the historical period during which they have been formalized, reveals that they have mainly been responses to social dynamics. There has not been established an absolute truth about the right or wrong way of building —the outcome of the process has been easier to understand and value when compared to the triggers that initiate it. The performance of a building assembly or parts of it, is a more reliable way to determine how to regulate.

The scope of concerns is also not an absolutely determined range. The issues that concern authorities and those holding power to regulate, vary from locality to locality. They are influenced by local circumstances, like terrain or climate, and by social or traditional habits and customs. A comparison between the Kenya regulations and say, the Australian regulations will show shifting emphasis. The structure and customs of society, and the physical environment contribute to the structure and substance of the regulations.

It is also evident that the regulations recognise that the building process is the result of design thinking. The outcome of design is inherently unknowable and there are multiple ways in which a desired level of performance can be achieved.

With these consideration in mind, the research embarks on an exploratory journey out of which a theory will emerge. This aspect of the research means that an open mind is maintained and no

position is being confirmed as such; rather, the truth will emerge through an inductive process as will be seen below in the discussion on strategy.

3.3.3 Validity of the analytical process

The validity of such an approach is anchored in the nature of generalisation that will result from it. An inductive process like applied in this inquiry, does not seek to generalise to a population where a sampling process would be applicable and relevant. In this case, the research expects to generalise to theory (as opposed to generalising to a population). This informs the areas of data that are to be interrogated.

3.4 Research Design

My overall research plan kept in focus the qualitative nature of the work. In order to comprehensively address the research objectives, a framework of analysis was developed. This framework serves as a reference point or datum for the analysis. The framework is developed through a close reading of key documents.

The overall research design is a plan, a procedure, or a framework whose purpose is to guide the decisions that have to be made in order to address the research problem. (Creswell, 2007; Adu, 2019; Sileyew, 2019). Creswell, (2007) identifies research designs as an *intersection* of a philosophical worldview, a strategy of inquiry and the specific methods of research. His framework of design is summarised in Figure 3.1.

The primary consideration in the formulation of a research design, is the nature of answers sought by the objectives of this research; what points to an answer to the research problems. interpretative paradigm is well suited to assist the inquiry and guides in the formulation of the research design. As explained above, and following on Van Esch and Van Esch (2013)the conceptual foundation to guide this approach is developed from the consideration of the social phenomena under scrutiny in

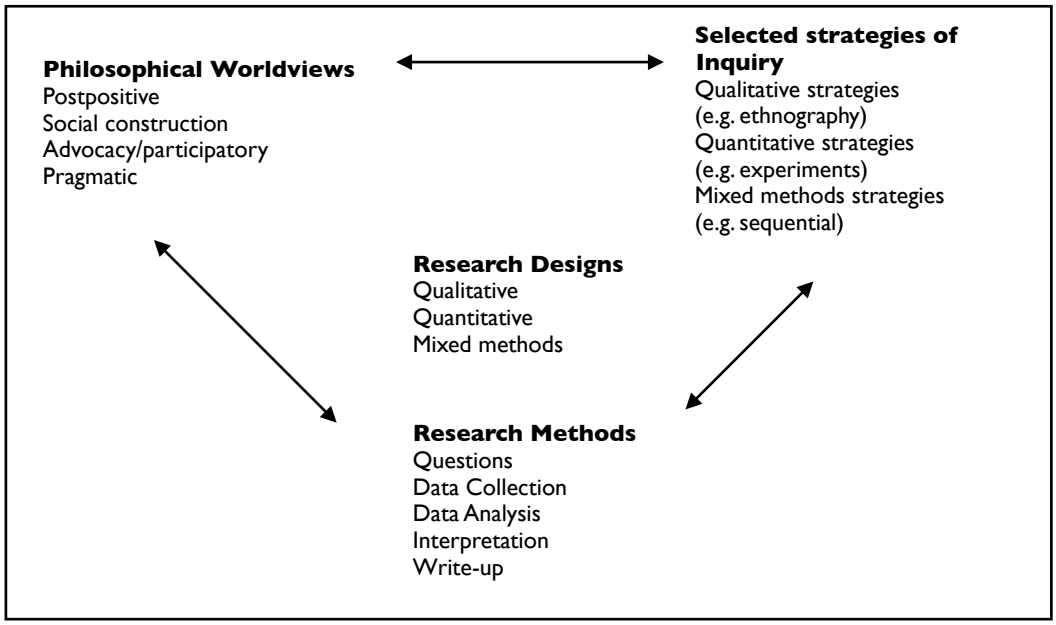

Fig 3.1: Research Designs *Source: Creswell, (2007)*

this study. The processes under study involve the attempt to modify human actions to achieve an outcome that is eventually subjective.

Interpretive research as an approach has strong scientific basis. It offers an alternative to the study of social phenomenon where meanings, history and beliefs are significant. Naturalism, which springs from the belief that human behaviour is comparable to the natural sciences, eliminates values and human relationships from the study of behaviour (Bevir, 2018).The interpretive philosophy may be seen as a "repudiation and turning away from naturalism's increasingly dominant conception of social science …." (Bevir,2018).

Interpretive inquiry, as is the case with all other forms of qualitative inquiry, focuses on understanding (interpreting) the meanings, purposes, and intentions (interpretations) people give to their own actions and interactions with others. (Given, 2008). The essence of the term *interpretation* denotes an emphasis on the importance of seeking explanation of human meaning. It connotes an opposition to the kind of reductionism whereby all discussion of meaning is avoided as much as possible. (Mills, et al, 2010).

The entirety of the social phenomena that is regulation, is man-made. It does not occur naturally in nature. The success of the endeavour being a human construct, can only be understood and appreciated, and is not malleable to objective measurement. The researchers analytical and integrative skills must be brought into play to make sense and understand the experience.An interpretative approach to the research, allowing for reflection and introspection of the data available, is therefore the most appropriate for the purpose.

This approach serves to locate the ontological stance of the study within a relativistic domain. Whereas the literature suggests strongly that the basis of regulation is in our nature as human beings - our physiology, our innate capacity to fight disease, - the nature of settlement is very firmly the results of human endeavour in response to multiple forces in the environment. A positivist approach would be limited in the investigation of this research problem, the limitation arising out of the weakness in unearthing embedded meaning. Communication and interpretation are cognitive and interactive processes that can be tacit and subconscious and would lose the potency when reduced to qualitative measures. (van Esch and van Esch, 2013).

Table 3.1 demonstrates the broad explanations of *Positivism* and *Interpretivism*. In the main, the difference between the two approaches spring from the stance that in one, Positivism, the researcher and reality are separate. Positivism turns on a distrust of abstraction, a preference for observation unencumbered by too much theory, a commitment to the idea of a social science that is not vastly different from natural science, and a profound respect for quantification (Given,2008).

In interpretivism, the researcher and reality are inseparable. This is the ontological standpoint. The nature of reality is seen to be objective and tangible by the positivists and as a socially constructed and contextual by the interpretivists.

Table 3.1: Summary of Assumptions.

Assumptions	**Positivist qualitative**	**Interpretive**
Ontological		
Nature of Reality	objective; tangible; single; fragmentable; divisible	socially constructed; multiple; holistic; contextural
Nature of social beings	deterministic; reactive	voluntaristic; proactive
Axiological		
Overriding goal	explanation; prediction	understanding
Epistemological		
Knowledge generated	nomothetic, time-free; context-independent	idiographic; time-bound; context-dependent
View of causality	real causes exist	multiple; simultaneous
Research relationship	dualism; separation; privileged point of observation	interactive; cooperative; no privileged point of observation

Source: Adapted from Hudson and Ozanne (1988), p.509

The epistemological stance for positivists sees an objective reality that exists beyond the human mind, while the interpretivists see the knowledge of the world as intentionally constituted through a persons lived experience. While the former choose statistics as a method, the latter will turn to hermeneutics and phenomenology.

A further distinction can be made in the understanding the two paradigms of the emergent truth: in positivism, the research statements correspond to the reality; while in the other truth is an intentional fulfilment with the interpretation of the research object matching the lived experience of the object.

Urban resilience is a resultant of actions of man. In Chapter 2 of this study, I established that urban resilience is a designed condition. It is a condition that is the result of the actions of human being and the processes of society. This statement emphasises that this is not a natural condition. It does not arise from any intrinsic natural phenomenon. The import of this is that urban development and the urban conditions are inherently related to the values and history of societies, carrying with them the cultural and value system of that society.

In all the purposes that produce cities, the need to create environments that deliver a quality of life is inherent, and society will naturally seek to preserve and enhance those qualities. The task is to find whether the regulations, as stated, point to that morality, whether they aid in the construction of a framework of right and wrong in the process of shaping the living environments, and in society in general, that then contributes to the creation of resilience in the community.

Urban resilience emerges from an attitude that positively orients players -members of the community- to actions that preserve the life sustaining qualities of the living environment. The regulations assist in the creation of this attitude through aspects of their character and it is from this insight that I have developed the category variables of this study.

Therein, the connection between the regulations and urban resilience is established. This tallies broadly with the historical trajectory that demonstrates that the aspects of regulation have been key to the emergence of healthy and liveable environments.

In order to find out how the state regulations communicate the morality of urban developments, it is necessary to undertake an in-depth interrogation of the regulations.

The foregoing demonstrates succinctly the logic of an interpretive approach to the research. The outcomes envisaged in this choice is defensible knowledge and insights, arrived at through logical interpretation of the material examined.

3.5 Research Method

3.5.1 Justification for the Method of Qualitative Document Analysis

The literature review in this study, has led to the theoretical position that the nexus between building regulations and urban resilience can most likely be revealed by a deep interrogation of the embedded communication in the stated regulations. In this respect, the building regulations are recognised to have gathered the historical concerns and embedded the critical essence in the body of the language.

The philosophical framework for the regulations therefore, tends firmly towards social construction. Social Constructivists hold assumptions that individuals seek for understanding of the world in which they live and work. (Creswell, 2009, p8) Experiences may yield subjective meanings and the researcher has to contend with the complexity of views, rather than the narrowing that comes from reducing them to a few categories and ideas (Creswell,2009).

The necessary interaction with historical and contemporary documents as a critical source of understanding, recognises the relevance and increasing significance of hermeneutics as a research strategy. Hermeneutics challenges both the aim of social science and its reliance on a narrow conception of understanding encouraged by scientific methods. It alters the conception of inquiry from seeking explanations or understanding about someone or something to one of engaging with the dynamic and historically situated nature of human understanding. Inquiry, therefore, is no longer framed as a separate event from that which is being inquired into; both must be acknowledged in the final analysis. By embracing this approach, the analysis goes beyond seeking explanations or understanding about something and engages with the inherent nature of human understanding (Bevir, 2018)

The Qualitative Document Analysis is a research method for rigorously and systematically analysing the contents of written documents. It is an approach that has been used in disciplines like political science and law where written material is a source. (Wach,2013) The method is suitable in this research work where an interrogative paradigm has been adopted holistically.

The first objective of this study is to discover the underlying philosophy of the building regulations. This is geared towards laying a solid basis for the research to connect with the essential nature of the regulations and to discover the fundamental tenets. This in turn will inform the further interpretation of the specific regulations for Kenya as they are stated.

The strategy in this part of the research relies on a wide reading of pertinent literature for analysis that sheds light on the nature and the process that gave birth to the regulations. As a prior concern the study starts with an interrogation of the process represented in the verb "regulation" and the justifying philosophy. Content analysis was deemed to be the most suitable research design. It promised to get to the core of the research question through a hermeneutic analysis of the specific body of material that contain the building regulations. A hermeneutics involves interpretation of documents to unearth the embedded meanings and to draw interpretations from them.

(The term *Text analysis* is used by van Esch to encompass both a quantitative approach, which he calls Content analysis, and a qualitative analysis, which he terms hermeneutics. Other authors however (Leddy and Ormrod, 2018; Cresswell,2007; Adu,2016) also use the term Content analysis in reference to a qualitative approach).

Leedy and Ornrod (2018) in a deviation from Creswell's and other definitions of research design, identify "*Content Analysis"* as one of the available designs for research. Content analysis is defined as "a detailed and systematic examination of the contents of a particular body of material for the purposes of identifying patterns, themes and biases - and are typically performed on forms of human communication." (Table 3.2)

Table 3.2: Distinguishing characteristics of different qualitative research designs

Design	Purpose	Focus	Method of Data collection	Methods of data Analysis
Case Study	To understand one person or situation (or perhaps a very small number) in great depth	One case or a few cases within its/ their natural setting	•Observations •Interviews •Appropriate written documents and/ or audiovisual material	Categorisation and interpretation of data in terms of common themes Synthesis into an overall portrait of the case(s)
Ethnography	To understand how behaviours reflect the culture of a group	A specific field site in which a group of people share a common culture	•Participant observation •Structured or unstructured interviews with informants •Artifact/document collection	•Identification of significant phenomena and underlying structures and beliefs •Organisation of data into a logical whole (e.g. chronology, typical day)
Phenomenological study	To understand an experience from a participants point of view	A particular phenomenon as it is typically lived and perceived by human beings	•In depth unstructured interviews •Purposeful sampling of 5-25 individuals	•Search for meaning units that reflect various aspects of the experience. •Integration of the meaning units into a seemingly typical experience.
Grounded Theory Study	To derive a theory from data collected in a natural setting	A process, including human actions and interactions and how they from and influence one another.	•Interviews •Any other relevant data sources	•Prescribed and systematic method of coding the data into categories and identifying interrelationships. •Continual interweaving of data collection and data analysis •Construction of a theory from categories and interrelationships.

Content Analysis	To identify the specific characteristics of a body of material	Any verbal, visual or behavioural form of communication	•Identification and possible sampling of the specific material to be analysed •Coding of the material in terms of predetermined and precisely defined characteristics	•Tabulation of the frequency of each characteristic •descriptive or inferential statistical analyses as needed to answer the research questions.
Source: Leddy and Osmond, 10th ed, p.150				

It is in this *detailed and systematic examination* that the tool developed from integral theory has found its application. My belief in the strength and validity of this approach - Content analysis design - is reinforced and supported by authors who have either used successfully or explained the methods. (Hsieh & Shannon,2005: Cavanagh, 1997: Krippendorff,2019). The method is one that offers researchers a flexible, pragmatic method for developing and extending knowledge of the human experience (Hsieh & Shannon, 2005).

As a form of communication, the stated regulations would potentially yield valuable insights into the themes and concerns contained therein. This would be immensely appropriate to address the research question which seeks to find relationships between the stated regulations and the broader concerns of urban development, but which also carries meanings from historical development.

As a consequence the research design formulated for this study is Content Analysis and relies on a interrogation of the clauses of building regulation to advance the overall objective of understanding the meaning of the stated regulations. This understanding is contained in the stated regulations and therefore the research is based on examination of available documents. The building regulation documents are structured in the form of clauses. In this study every clause was examined and

categorised as a first step in a coding process. The details of this process are explained further below.

At this stage then, content analysis is the preferred method of interrogating the available material and the research process moves forward from this point. This approach is logical in supporting the overall goals of the study and is strongly endorsed by key authorities in research methods.

As a general rule, a content analysis is quite systematic (Leddy and Ormrod, 2018). Accordingly, the stated three steps would broadly described the method of carrying out this analysis. As a start, the researcher identifies the specific body of material to be studies. If the work is relatively small, it is studied in its entirety. If quite large, it is acceptable to select a sample.

In this study, the documents to be studied were identified as the incumbent set of building regulations for Kenya and in the more recent efforts. The Kenya Building Code serves as a key reference point. However, the efforts that have been made over the years to introduce a new code in Kenya are recognised and also relied upon for the up to date thinking. In this respect the Draft building Regulations of 2017 have been adopted as a key source of the current thinking.

In the subsequent step, I took note of the characteristics of the documents. The building regulations communicate in clear distinct statements, called clauses, each of which addresses itself to a specific action in the construction process. The purpose of each clause is to offer guidance on how the builder needs to approach the task.

Thirdly, the research scrutinised the material for instances of each characteristic or quality defined in the earlier step. Judgement was then applied at this point as to what the clause if communicating, and this judgement is recorded as described below.

The method applied in this study is the “Code and Retrieve’ method. The subject matter is the building regulations as stated in the formal documents.

As indicated, those documents have been examined in their entirety. Through a coding process each clause is categorised on the basis of the perceived significant information. The categories of this information are derived from the primary codes.

The coding process has relied in the main on the method proposed by Johnny Saldana's The Coding Manual for Qualitative Researchers, which is a text recommended by other qualitative researchers (e.g. Adu, 2016). The process is illustrated in the graphic Figure 3.4.

3.5.2 Researcher's background, beliefs, and biases

It is required in research and especially qualitative research, that the background and beliefs of the researcher be presented in order that some perspective can be given to the process adopted by that researcher.

In the current study, it is significant that the researcher is an architect and an educator who has been teaching at University level for more than twenty years prior to embarking on this work. That career period has been spent in the large city of Nairobi, which is a city that has undergone very rapid expansion.

The interest with the twin subjects of Building regulation and Urban resilience arises from this work and this exposure. The city of Nairobi faces the pressures of a rapidly expanding city, which inevitably means that a lot of construction is undertaken and quite often, traumatic failures are reported. Evidence is also presented in the media and other forums to indicate that the resultant environment is not of the envisaged quality despite significant investment being made.

This researcher who is involved in the process of training architects, grapples consistently with the notion of inadequacy of the building designer in assuring a resultant quality of environment. The work of the architect is eventually dependent on externalities if it is to contribute to the quality living environment of the growing city. This is the background that creates an interest into one of the externalities namely the regulatory regime.

While it is true that I have spent a lot of time working in Nairobi, I am also sensitive to the direction of small town development in Kenya. Given that Kenya is on an unavoidable trajectory toward greater urbanisation, an optimist may see an opportunity to contribute to the direction of this urbanisation, by making sure that the guidance available for urban growth leads to habitable and resilient towns. The current situation is therefore a useful laboratory for the development of such guidance.

This research is therefore driven by a desire to contribute to a better understanding on how to regulate with a result in mind. My position as a teacher of architecture places me in a situation to consider the responsibility for this task, and to come round to a conclusion that such responsibility devolves to such like myself and other in a similar position.

In the course of my work, I have been involved in the discussions leading to a new set of regulations for the country. My involvement however was brief and intellectually stimulating, but left far too many questions unanswered. This work is partly meant to ease these anxieties.

3.5.3 Possible biases

The above background may suggest some biases in the approach taken to answer the research questions. As an architect, I regard space as the critical factor in quality of life, and the human agency in shaping that space to be a key driver. This may subconsciously cause an inflated belief in the power of citizens to shape their environment. It may also lead to unintentional suppression of the other factors that contribute to urban resilience and urban quality.

3.6 Data Sources

The process of evaluating the Kenya building regulations starts with the identification of the location of these regulations. This is then supplemented with a process of deep interrogation to uncover the meaning that these regulations seek to convey. Through these two steps, a basis is created to form opinion and make conclusions about the nature of the regulations.

Interpretive research typically draws on one of these methods in generating data: observing, interviewing or reading. These methods are in line with the social constructionist approach and distinguishes from the common reference to “collecting” or “gathering” data. (Yanow, 2007)

In this study, the main source of data is contemporary documents. documents to be studied were identified as the incumbent set of building regulations for Kenya and in the more recent efforts. In this case, the Kenya Building Code of 1968 serves as a key reference point. However, the efforts that have been made over the years to introduce a new code in Kenya are recognised and also relied upon for the up to date thinking. In this respect the Draft Building Regulations of 2009 have been adopted as a key source of the current thinking. Further revisions to this later document are consulted for comparison and observation of any material variation. (Table 3.3)

In the subsequent step, I took note of the characteristics of the documents. The building regulations communicate in clear distinct statements, called clauses, each of which addresses itself to a specific action in the construction process. The purpose of each clause is to offer guidance on how the builder needs to approach the task.

Thirdly, the research scrutinised the material for instances of each characteristic or quality defined in the earlier step. Judgement was then applied at this point as to what the clause if communicating, and this judgement is recorded as described below.

Table 3.3 Key Documents providing the Data

Document	**Full Title**
Key Reference Documents	
Building Code 1968	Local Government (Building) By-laws 1968
Draft Building Regulations 2009	Planning and Building Regulations 2009
Supplementary Reference	
Building Regulations 2015	National Building Regulations 2015
Building Code 2020	Draft National Building Code 2020

The active building regulations in Kenya are contained in the Building Code, the document that has been the point of reference since 1968. This has been the statement that has carried the governing law on the building process for all construction. For a long time however, the desire has been expressed to create a new regime of regulations for the country. Although such a code has not been enacted, important drafts of new regulations have been completed and they represent considered position of the new regulations.

This study has assessed this draft as part of the examination, and this has been incorporated in the analysis. It forms a big part of the data set that has been analysed for this study.

3.6.1 Data Reduction

Fundamentally, the coding process involves reducing the information contained in a clause of the regulations to a code. A code starts with the identification of the significant information and represents the significant part of the regulation. The significant information is found in the language of the clauses and makes the coding process intrinsically an examination of language use. Coding can also be seen as a process of summarising (Adu,2016; Saldana,2016) and reducing the regulations to easily communicable language. The process of coding therefore seeks to preserve the significant information and extract it for further analysis.

The application of software (see below) allowed the research to dispense with the need to sample the material and made possible a comprehensive interrogation by examining every clause in the regulations.

3.6.2 Possible Biases in the Process

This process of identifying significant information is value loaded and is not always objective. The meaning attached to words and their use will be affected by the observers biases and sense of value. It is significant therefore that in this study, the author is an architect. This fact means that certain

importance may be attached to some words which would otherwise be judged differently by a person with a dissimilar background.

Architecture as an academic discipline concerns itself with space and how it is shaped to accommodate human function. Architects look at space and the processes that may impact its shaping from the standpoint of human emotion, concerning itself with the emotional connection to the use and identification with human life.

3.6.3 Identifying Significant Information

Each clause of the regulations seeks to point or seek a particular outcome. There is a wide range of devices that the regulations employ in order to compel the desire outcomes. The coding process sought to understand these devices on the basis of the outcomes they were seeking to catalyse. These devices which will be contained in the language of the clause are the basis for the analysis we undertake.

3.6.4 The Spectrum of Concerns of the Regulations

The Building regulations seek to deliver a guidance for the building process in order that a predictable outcome can be fashioned. The process and methods of delivering this guidance are wide and varied. On the whole, the regulations will seek to:

- Control the building process by laying down minimum standards of work
- Offer an educational insight by providing indicators of acceptable performance standards without prescribing how they should be achieved.
- Creating mandatory prescriptions that must be met in the process of building.

The regulations also offer guidance through:

- Criminalising certain actions that may occur in the building process and instituting penalising for such infringement.

- By prescribing the expertise that must be employed in achieving identified tasks.

The Table 3.4 below shows the range of positions, attitudes and actions envisaged by the Kenya code.

Table 3.4 Codes developed in the Study for the Kenyan Regulations

Position of Significant information	Brief extrapolation of the import of the regulation
1. Attitude	
• Restrictive	*The regulation creates restriction on an action making the outcome a highly predictable one. This may be understood to communicate best practice by the authority.*
• Permissive	*The regulation allows room for innovation and invites different approaches of reaching a desired outcome.*
2. Standards	
• Minimum standards	*The regulation indicates a minimum acceptable standard. This is likely protective so that a negative outcome is forestalled.*
• Workmanship	*Proper and correct use of materials is a factor in the safety of the resultant structure. It also contributes to visual order*
3. Responsibilities	
• Power of Council	*The Council or relevant municipal authority, has overall responsibility on what gets built and has to occasionally project their powers in order to compel a particular outcome*
• Actor Responsibilities	*Reminders have to be highlighted relating to the role of particular players. These may include the owners of constructions or the artisans and professionals employed on the job.*
4. Health	
• Sanitation	*Health is a shared responsibility and a single individual can, through their actions, jeopardise the health of a community.*
• Showers	*A more economical and efficient way to achieve body cleansing.*
5. Practicality of Use	
• Anthropometrics	*The regulations protect human dignity. This makes sense because of the asymmetric nature of information in the building process*
• Service Space	*Appreciation that some human activities require an ordered process*
6. Performance Standards	
• Water Ingress	*Absolutely critical in the provision of shelter*
• Structural Stability	*This has implications on mortality. The threat of buildings collapsing needs to be eliminated.*

Table 3.4 Codes developed in the Study for the Kenyan Regulations

Position of Significant information	Brief extrapolation of the import of the regulation
• Refuse handling	*This also has an impact of the health of the population and thus impacts of the mortality of the citizens.*
• Ventilation	*A health matter impacting on the mortality of the population and users of buildings.*
7. Relationships	
• Mitigation	*A critical function of the regulations in creating a situation devoid of conflict.*
• Defence	*Pre-empts the possibility of conflicts between property owners*
• Siting of Buildings	*Creates order in the population by mitigating on possible sources of conflict arising from buildings*
8. Safety of Structure	
• Nature of terrain	*Necessary response to the natural state of things.*
• Stability of Structure	*Protecting the users of a building who have no information on how it has been put together*
• Nature of Soil	*The nature of the soil has a bearing on the safety of building placed thereon*
9. Shelter	
• Moisture handling	*Impacts on the provision of shelter*
• Pests	*Pests have nuisance value and may in cases threaten the safety of structures*
10. Material usage	
• Quality of materials	*A fundamental issue. This has a strong bearing on the capacity of a structure to deliver shelter and safety.*
• Forbidden	*Some material, arising from a not so obvious nature, are forbidden for use. They may give false assurance of comfort.*
• Dangerous materials	*Dangerous material will be declared as so and banned for use.*
• Prescription	*Prescription of a material or method of use, gives assurance that the safe standard of safety or health will be maintained.*
11. Information sharing	
• Duty to inform	*Declaration of information allows for rectification or remedy of error*
12. Handling of Food	
• Storage	*A fundamental issue of human health that cannot be left to chance*
• Preparation area	*Impact on the protection against contamination.*

Table 3.4 Codes developed in the Study for the Kenyan Regulations

Position of Significant information	Brief extrapolation of the import of the regulation
13. Fire safety	
• Human safety	*Basic focus on the preservation of human life in the case of fire.*
• Protection of Property	*This will preserve the economic investment made in the property, and prevent spread.*
• Provision in design	*Has to be factored at the design stage*
• Elements that contain fire	*This is a particular source of risk of fire and requires special attention*
• **Drainage**	*Drainage has a critical impact on the maintenance of health in the population*
14. Education	
• Deemed to satisfy	*A short cut and educational stance by presenting a ready answer to the demands of a regulation.* *The deemed to satisfy provisions are educational in nature and seek to transmit what is known to work. In this they fulfil a critical role of the regulations which is to teach the population on the best practices available. It is important to note also that they are nor compelling in that they leave room for interpretation.*
• Best practice	*Similar educational approach by offering the best understanding of a situation*
• **Criminalisation**	*This would reflect a dire situation where the wellbeing of the community is severely threatened.*
• **Aesthetics**	*This addresses the sensibilities the population and inherently recognises that it contributes to well being.*
• **Licensing**	*The need to obtain a licence centralises decision making in the activities to be licensed. This ensures that an authority is able to control such activities and thus exercise judgement on the merits of the action.*

This range of concerns has a direct bearing on the effectiveness of the regulations on the resultant environment.

The process of coding has followed the guidance offered by leading scholars. The methods developed by Johnny Saldana (2016) were especially helpful in giving an impetus to this work. This methods is recommended by other scholars (Adu, 2016).

3.7 Data Analysis Technique

The specific research methods follow from the framework that springs from the research philosophy and the identified research design and strategy. This stage of the study involves the selection of the data, the analysis and the interpretation. There is a wide range of possibilities of handling the data at this stage. The nature of the data largely determines the most appropriate method for processing it.

3.7.1 Rationale of the conceptual framework

Through the survey of literature and especially on examination of guidelines set out in international conventions, a framework to help interrogate the building regulations has been established. The structure has an eight prolonged mechanism that creates a robust framework:

(i) The range of concerns

The historical development of building regulations have been driven by a reaction to actual disasters that have hit urban environments. The situation within the industrial cities has already been explained in the earlier parts of this study (Chapter 2). The effort that produced the first versions of the Public Health laws had a great concern in protecting the health of the population but this effort was building on a basic structure that existed in response to earlier calamities like the great fire of London of 1667.

Over time more concerns have been appended to the regulation as the realisation keeps revealing of the complexity of the urban environment and its sustainability as a life sustaining entity. It is however in the realm of this enquiry, the extent of concern of the building regulations. A narrowly stated set of regulations could conceivably treat some critical issues in a benign manner, while a too broad a mandate would carry the risk of constraining the agents of development of the built environment.

Further, the regulations have to respond to the environment they are addressing in terms of the technological level and the attitude of society to the building process.

The insights into the concerns of the code, springs from the understanding that the building regulations seek to deliver a guidance for the building process in order that a predictable outcome can be fashioned. The process and methods of delivering this guidance are wide and varied. On the whole, the regulations will seek to:

- Control the building process by laying down minimum standards of work
- Offer an educational insight by providing indicators of acceptable performance standards without prescribing how they should be achieved.
- Creating mandatory prescriptions that must be met in the process of building.

The regulations also offer guidance through:

- Criminalising certain actions that may occur in the building process and instituting penalising for such infringement.
- By prescribing the expertise that must be employed in achieving identified tasks.

The table below shows the range of positions, attitudes and actions envisaged by the Kenya code.

This range of concerns has a direct bearing on the effectiveness of the regulations on the resultant environment.

(ii). The comportment of the regulations

The international conventions recognise the need to gain acceptance within the populations to achieve an environment of low risk to disaster. The Sendai framework talks about "*incentives and decision making responsibilities"* for local communities. Further the framework highlights the need for an all-of-society engagement with the issues.

The task of creating shelter is a primordial sentiment and the creation of socially shared settlements if inherent in all of us. (Mumford,1961; Kostof,1992) The institution of a code that would be binding to a population would require to carry persuasive power to gain acceptance and nudge the population to positive outcomes envisaged.

The building regulations would have to be a part of life pattern of the community to achieve acceptance. The historical perspective suggests that populations have to be convinced on the rightness of the direction in order to engage and adhere. Out of this concern, this study tests the demeanour of the regulations.

(iii). The Thrust of the Advocacy of the Regulations

Later in this study, in Chapter 4, we explore the philosophy underlying the building regulations as they have developed through history. We should reasonably expect that the regulations are fundamentally reactive to the lived experience and may indeed by contested. There is however a directional consistency which favours the protection of the life sustaining aspects of a settlement.

The events of the last part of the 20th century which have highlighted the importance of the environmental consciousness in the build environment, provided a demonstration of the growing complexity of this question. (World Commission on Environment and Development, [WCED] 1987).

In the beginnings of the 21st century, the matter of the outcomes the building regulations would aim for, is further complicated by the advent of pandemics, the most important of which has been the Corona Virus disease of 2019 (Covid-19). This would trigger for the researcher a concern for the manner the regulations would address the necessary response within the population. In their broad advisory, the World Health Organisation advised on social distancing as a response, which translated widely to impact on the use of public spaces

(iv). The Critical concerns and the envisaged outcome

The building regulations have evolved as a result of crisis within communities. Their fundamental purpose is to forestall such crisis and as far as is possible to guarantee against recurrence. This indeed has been the singular success of this aspect of governance.

(v). The Level of Authority in the Regulations.

Hertog (1999) has offered that regulation "mean employment of legal instruments for the implementation of social economic policy objectives." As already pointed out, A characteristic of legal instruments is that individuals or organizations can be compelled by government to comply with pressured behavior under penalty of sanctions.

In the previous pages, we underlined the objectification of the city as building fabric (Fry, 2017). We have argued that the acceptance of the city as a complex entity underlies the expansion of the scope of the regulatory regime. This has been reinforced by the approaches in other jurisdictions like United Kingdom and Australia.

The essential focus of the building regulations would carry forward the concerns that gave rise to the regulations in the first place, and in this respect the original public health laws are an important reference point. The health of the population, especially as it was affected by the handling of waste, was paramount. It is the biggest threat to the existence of the population and to creation of a conducive environment to bring up the young.

An effective code or set of laws would need to have at the core the aspects that carry through this spirit.

(vi). Educative Values Incorporated

Resilience building requires that communities strengthen and improve their approaches to among other things knowledge creation (Rodin, 2015). Being aware is an essential aspect of resilience building. The building regulations are a communication with the population and offer an

opportunity to deliver insights and learning. In the review in Australia, for example, the educative value of the regulations was recognised as a critical outcome.

(vii). Incentivizving Values of the Regulations

In the nudge theory of behavorial economics, proposes positive reinforcement and indirect suggestions as ways to influence the behavior and decision-making of groups or individuals. (Thaler and Sunstein, 2008)

In a dynamic and continuously evolving environment, an attitude to contribute to positive behaviour is a useful one. International conventions on Risk reduction have also captured this need to keep society positively engaged. The possibility of creating incentives within the population is tested in this study, in order to see the nudge value represented.

(viii). The Incorporation of the Commons as a Concern

The common interest theory of regulation should lead us to expect that the regulations will show a committed concern for the shared resource, notably the space and installations that serve the entire community.

This study tests this aspect as an important response to the findings of the first objective and the literature review. These two surveys lead to a conclusion that the health of the urban settlement as a life sustaining entity is domiciled in the main in the common space. The attitude exhibited to this matter in the regulations would critical in determining the potency of the regulations in protecting the resilience of the settlement.

Table 3.5 presents a summary of the parameters in the Conceptual Framework.

Table 3.5 Summary of the Conceptual Framework used for analysis	
1	The Scope of Concerns in the Regulations
2	The Comportment Of The Regulations
3	The Thrust Of The Advocacy In The Regulations

4	The Envisaged Outcomes Of The Regulations
5	The Level of Authority in the Regulations
6	The Educative Values of the Regulations
7	The Incentivising Value of the Regulations
8	Incorporation of the Commons in the Regulations

3.7.2 The Treatment of the Data

The data selected for the study has been identified in the section on Sources of data below. The documents containing the regulations are formulated to communicate instruction and guidance. Each clause of the regulations seeks to point to or seek a particular result. There is a wide range of devices that the regulations employ in order to compel the desired outcomes. The coding process sought to understand these devices on the basis of the outcomes they were seeking to catalyse. These devices, which will be contained in the language of the clause, are the basis for the analysis we undertake.

Given the nature of this data, several approaches are possible in interrogating it. The research is looking for meaning and this leads to the need to engage with the language and the words of the clauses of regulation. The interpretive process is word based and words are the sources of meaning. It has been suggested that there are three approaches available at this point : intentionalism, textualism and purposivism. (K'Akumu, 2022). Intentionalism tries to decipher what the intentions of the statement was when it was formulated. Textualism on the other hand emphasises semantic content rather than social content and "downplays the practical consequences of a decision" (Grove, 2020) Purposivism is more focussed on the outcome but acknowledges the imprecise nature of language and thus allows for consideration of context. These terms have been debated intensely in legal circles and deeper nuance developed (Grove, 2020; Stack, 2015; Marmor, 2012 etc).

For the purpose of this study purposivism is the most appropriate method and is well aligned with the stated overall goal of the formulators of the regulations. However, it is not possible to ignore issues of intention. In the final instances and combination of intentionalism and purposivism is applied. The specifics of the application of this research method are explained in the section on Data Analysis below.

3.7.3 The Code and Retrieve Method

The method applied in this study is the "Code and Retrieve' method. The subject matter is the building regulations as stated in the formal documents. The documents have been examined in their entirety. Through a coding process each clause is categorised on the basis of the perceived significant information. The categories of this information are derived from the primary codes.

The coding process has relied in the main on the method proposed by Johnny Saldana's The Coding Manual for Qualitative Researchers, which is a text recommended by other qualitative researchers (e.g. Philip Adu, 2016). The process is illustrated in the graphic Figure 3.4.

3.7.4 The Coding Process

The process of coding has followed the guidance offered by leading scholars. The methods developed by Johnny Saldana (Saldana,2016) were especially helpful in giving an impetus to this work. This method is recommended and used by other scholars (Adu, 2016).

Countervailing positions: There are however several countervailing positions that impact on the understand that can be attached to the character of the regulations.The summation of these positions arises from a reading of the regulations supplemented by domain knowledge of the researcher. The provide a better underrating on how the interpretation of the content is formulated and may moderate any biases that may be ascribed to the applied process.

(i) The building process envisages a design stage, within which decisions relating to the elements and the process of putting them together are made. It is at this stage that critical decisions about

the form and character of buildings are made, and new ways of solving problems are formulated. The knowledge of the building process continues to evolve and designers have a range of methods to deal with the problems that need attention. It is thus imperative that the regulations do not close the door on innovation and ingenious design.

(ii) There is no certainty on the range of building materials that may be developed to meet the various needs of the building process. In fact, material may yet be formulated that deliver superior performance than what we have today. The regulators would not shut the door to this development.

(iii) The regulations have an educative function regarding some of the better ways to build. This approach, which suggests the best way to achieved a desired outcome has been employed repeatedly in the regulations and serves to communicate what may have been deemed by experts as the most appropriate way to deal with a task. These are communicated as “deemed-to-satisfy” provisions where, once the requirement has been stated, the regulations then offer a solution which will satisfy the need.

(iv) Certain aspects of the building process are critical for the fulfilment of the critical function of safety and health and the regulations communicate this in very clear terms. These are the mandatory provisions which in many cases draw a line on minimum standards. This particular provision is critical as it reveals the aspects that are seen to be so important as to require every person - regardless of the capabilities or means available to them - adhere to.

(v) The regulations recognise the role of experts trained in particular areas. In instances, the regulations require the involvement of specific expertise like structural or service engineering, and evidence that this has indeed been done. This is a critical departure from the notion that commonly held knowledge - or vernacular knowledge - would suffice to create satisfactory environments.

(vi) The regulations require that a public record be made of the processes and structure that contribute to the creation of the environment. This is through a mandatory process of certification, notification and the maintenance of information. This in the minimum ensures traceability of actions and decisions.

(vii) The power and mandate of the local authorities is emphasised in the prevalent theme of the regulations. The clear implication is that oversight is a necessary part of the building process in the urban system. The council will require adherence of set standards and may make declaration of zones and special circumstances. In similar manner, the council declares the scope of its jurisdiction to cover as much of the building activities as may be considered to be significant for the environment. Such jurisdiction is also then extend to activities, with the council holding the power to licence some activities in the building process.

(viii) A further factor in the regulations is a concern with aesthetics. This is a fairly subjective area but the regulations express an interest especially in the protection of view lines in the environment.

An appreciation of these positions is kept in mind in the analysis. They are a crucial part of the social -economic environment that the regulations are addressed to.

3.7.5 The Use of the Integral Theory as a Tool for Analysis

The use of integral theory has been adopted in this study to facilitate a comprehensive look at the impact of regulation. The basic framework of integral theory is the All Quadrant, All Levels (AQAL) formulation. The Four Quadrant thinking offers a model to analyse the nature of balanced architecture, and thus to locate the critical factors for its success. In this model the necessary response for architecture is seen to move from the individual to society, and from the objective, to the subjective (or alternatively from the interior to the exterior.)

The AQAL model offers the opportunity to get an all round view of the concerns expressed in the regulations. The model lends itself to adoption as a tool to make these assessments.

Different researchers have successfully applied this model to their own work. Within the field of architecture, the work of Peter Buchanan (2011) offers a useful reference point and his approach has been adopted here.

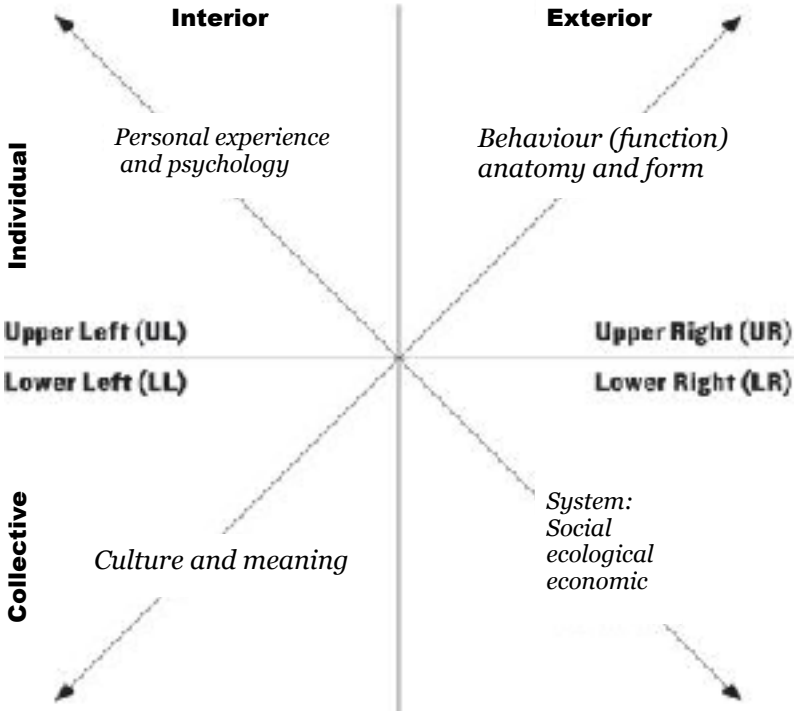

Fig 3.2: Conceptual representation of the AQAL model

Integral theory has been applied in other fields as well with the aim of helping to sort through a dynamic landscape of issues. Nancy Landrum and Carolyn Gardner (Landrum & Gardner, 2005) used the model to study strategic change. Esbjorn-Hargens applied the theory to education (Esbjorn-Hargens, 2010).

By adopting the logic of the integral theory and the AQAL construct, a framework was available for interrogating these concerns. This critical link can be established in a series of steps.

At the core of the concern is the question of "what is a building and why do we build?" The desire is to develop a discernment into the motivations of building, which then points us to an understanding

of what we seek to protect when we regulate.

Buildings serve different purposes, at different levels. We can employ the tool of integral theory in order to get some insight to the question. Integral theory is promising in this respect as it is described as a comprehensive approach to reality, a meta-theory – a theory whose subject matter is theory itself - that attempts to explain how academic disciplines and every form of knowledge and experience fit together coherently. (Wilber, 2006)

This study adopts this model, the four quadrant model, to interrogate the nature of response in architecture, and thus gain insight into the critical objectives of the building process. In so doing, the study will shed light on what the fundamental purposes of the building regulations are. The

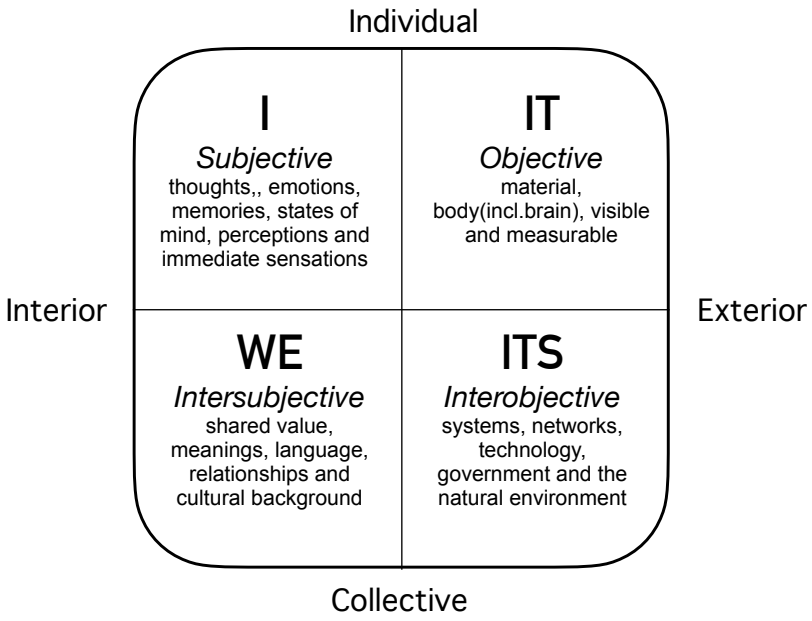

Fig 3.3: Conceptual representation of the AQAL framework

single building serves to answer issues from each quadrant. It serves to answer the values and beliefs of the individual.

- In the model the UL (Upper Left) quadrant represents the individuals internal concerns. It is the most intimate of the four quadrants and captures the values and beliefs of the individual, their tastes and personal aesthetic.
- The LL (Lower left) address the internal and collective concerns. Among these would be included the religious values, the acceptable standards and the ethical and aesthetic norms. Broadly, these would represent the rationale that society has for the correct behaviour and constitutes the culture of that society.
- In the UR (Upper Right) quadrant, the prevalent question is what the individual actually does. Matters of habit, skills, communication and health guide the day to day actions of the individuals and reflect the status the individual has within the community. This can be seen as the outward orientation of the individual towards their society and the wider world.
- The last of the quadrants LR (Lower Right) represents society and the actions and behaviours of the collective. In practical terms, this represents the systems and networks in play, the level of the technology available and the regulatory system in place. it is represents the attitude to the environment. These are actions and behaviours of the collective. (Buchanan,2011)

This analysis is meant to establish that in the process of building, man is thinking about themselves as individuals, but are rooted in collective understandings and appreciation. There are concerns to themselves and to the collective. The broader community is not merely a sum total of individual action, but is also significantly built by conscious collective action.

3.7.5.1 How the Model has been Applied

The AQAL model is applied in this research as a reference point for the coding process. My approach has been to use the derived insights in the four quadrants to resolve the categorisation of clauses in the first step of the coding process.

The inquiry therefore seeks to extract the embedded meaning and out of that, draw observations and conclusions. This inquiry seeks to adopt an inductive process where we move from the data to observations that may support a theory.

Under Data analysis below the process of applying this framework to the data, is explained in detail. The model of analysis developed connects the process to the fundamental issue of the content of the regulation as a social construct and has provided a clear and relevant path to the essence of the regulations.

3.8 Data Analysis

There is a vast array of interpretive methods of analysis that are identified. These include action research, case-study analysis, category analysis and word based content analysis. (Yanow, 2007) Some of these methods have been applied more in policy research.

Category analysis is deemed in this study to be the most suitable analytical method for the data at hand.This is consistent with the chosen interpretive approach which seeks to tease out embedded meaning and leads to category making through analysis of language and structure.

In order to achieve this, the coding process that offers a systematic way of arriving at codes and categories, is applied. The process is explained here below in more detail.

3.8.1 Creating the Codes and Categories

3.8.1.1 Defining the code

Saldana (2016) defines a code in qualitative inquiry as word or short phrase that symbolically assigns a summative, salient, essence capturing, and/or evocative attribute for a portion of language-based or visual data (Saldana, 2016, p4). Bazeley (2013) speaks of qualitative coding as a rigorous process which involves making meaning of the data collected that involves seeing and interpreting what has been said, written, or done; reflecting on evolving categories; deciding on

what is important to follow up. Adu (2019) explains that the concepts implied in the coding process are systematic process, data reduction, subjectivity and transparency.

There is a three step process in the coding. The initial examination seeks to focus on the significant information in each clause of the regulations and listing these pieces of information. this forms the first level of coding and reveals the range of actions and significant communication contained in the regulations.

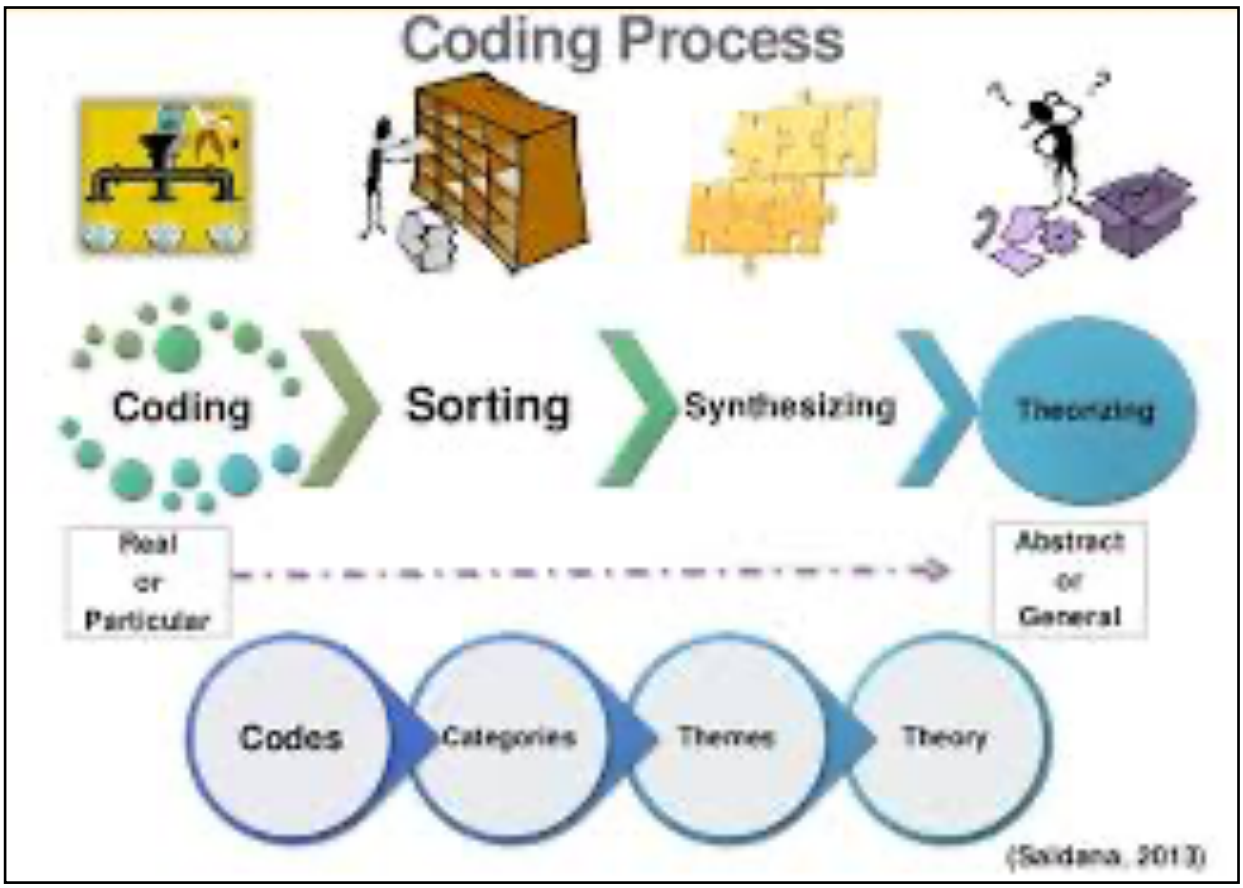

Fig 3.4 A graphic representation of The Coding Process (Source: Saldana J. [2016])

The next level seeks to create categories of the codes. This level delivers an advance on ways of re-organising and re-analysing the data coded through first cycle methods. (Saldana,2016). The primary goal at this stage is to develop a sense of categorical, thematic, conceptual and/or theoretical organisation from the outcomes of the initial step (Saldana,2016). In other literature, this

is identified as focused coding where categories are developed by identifying dominant codes and examining their relationships with remaining codes. (Adu, 2019)

The third level will look at the categories and see the themes that run through them. These themes are pointers to the underlying philosophy that runs through the regulations. This level is critical in the analysis as it affords the basis for a comparison with the set of issues predicted by the historical philosophy of the regulations determined through objective one of the study.

3.8.1.2 Interrogating the Actions of the Regulations

The set of regulations examined in this study, seek to achieve outcomes that in the overall control the built environment. As indicated earlier, the regulations employ a set of action that represent strategies for this process. The creation of regulations seeks to identify an action in the building process, and offer a guidance or otherwise seek to direct that action. In the entirety of these actions and guides, a picture emerges that clarifies what kind of environment is desired.

In the coding process, these positions of the regulations were interrogated and tabulated. The exercise of making the tabulation is not necessary objective and can reveal the biases of the author. The guiding question in the process is “what does this rule seek to achieve?” or sometimes “What does this rule compel the actor to do?” and crucially “Why has this rule been formulated?”.

The purpose of the exercise is to attempt, through the examination of language use and grammar of the clause statement, to distill the meaning that the clause seeks to convey. Such an examination, as already explained will carry the bias of the researcher and the world view inherent in them. In this case the outcome as regards the intervention on the physical space is critical and will invariably be the focus of the examination.

The research is interested in the level of control and the direction set out for activities of the building process. Although Saldana argues that the coding of the data is an activity between the researcher and the data, it is the intention of this researcher to include the codebook as an annex to

this work in order that the coding process and the judgement made therein are available for closer scrutiny.

3.8.1.3 Making the Assessment

In making assessment on the basis of such questions, the purpose of the approach is to unearth the range of actions that the building regulations seek to control. This will reveal to us what the formulators of the regulations deem to be important actions whose outcome matters for the overall health of the community. The authorities will want to intervene where they feel they must in order that common good is preserved in the community. It is therefore revealing the areas that they feel need to be controlled and the attitude that the rules must take.

There are however several countervailing positions that bring out the character of the regulations:

The building process envisages a design stage, within which decisions relating to the elements and the process of putting them together are made. It is at this stage that critical decisions about the form and character of buildings are made, and new ways of solving problems are formulated. The knowledge of the building process continues to evolve and those who are in the business of design have a range of methods to deal with the problems that need attention. It is thus imperative that the regulations do not close the door on innovation and ingenious design.

We do not yet know the range of building materials that may be developed to meet the various needs of the building process. In fact, material may yet be formulated that deliver superior performance than what we have today. The regulators would not shut the door to this development.

The regulations have an educative function regarding some of the better ways to build. This approach, which suggests the best way to achieved a desired outcome has been employed repeatedly in the regulations and serves to communicate what may have been deemed by experts as the most appropriate way to deal with a task. These are communicated as “deemed-to-satisfy”

provisions where, once the requirement has been stated, the regulations then offer a solution which will satisfy the need.

Certain aspects of the building process cannot be left to chance and the regulations communicate this in very clear terms. These are the mandatory provisions which in many cases draw a line on minimum standards. This particular provision is critical as it reveals the aspects that are seen to be so critical as to require every person - regardless of the capabilities or means available to them - must adhere to.

The regulations recognise the role of experts trained in particular areas. In instances, the regulations require the involvement of specific expertise and evidence that this has indeed been done. This is a critical departure from the notion that commonly held knowledge - or vernacular knowledge - would suffice to create satisfactory environments.

The regulations require that a public record be made of the processes and structure that contribute to the creation of the environment. This is through a mandatory process of certification, notification and the maintenance of information. This in the minimum ensures traceability of actions and decisions.

The power and mandate of the local authorities is emphasised in the prevalent theme of the regulations. The clear implication is that oversight is a necessary part of the building process in the urban system. The council will require adherence of set standards and may make declaration of zones and special circumstances. In similar manner, the council declares the scope of its jurisdiction to cover as much of the building activities as may be considered to be significant for the environment. Such jurisdiction is also then extend to activities, with the council holding the power to licence some activities in the building process.

A further factor in the regulations is a concern with aesthetics. This is a fairly subjective area but the regulations express an interest especially in the protection of view lines in the environment.

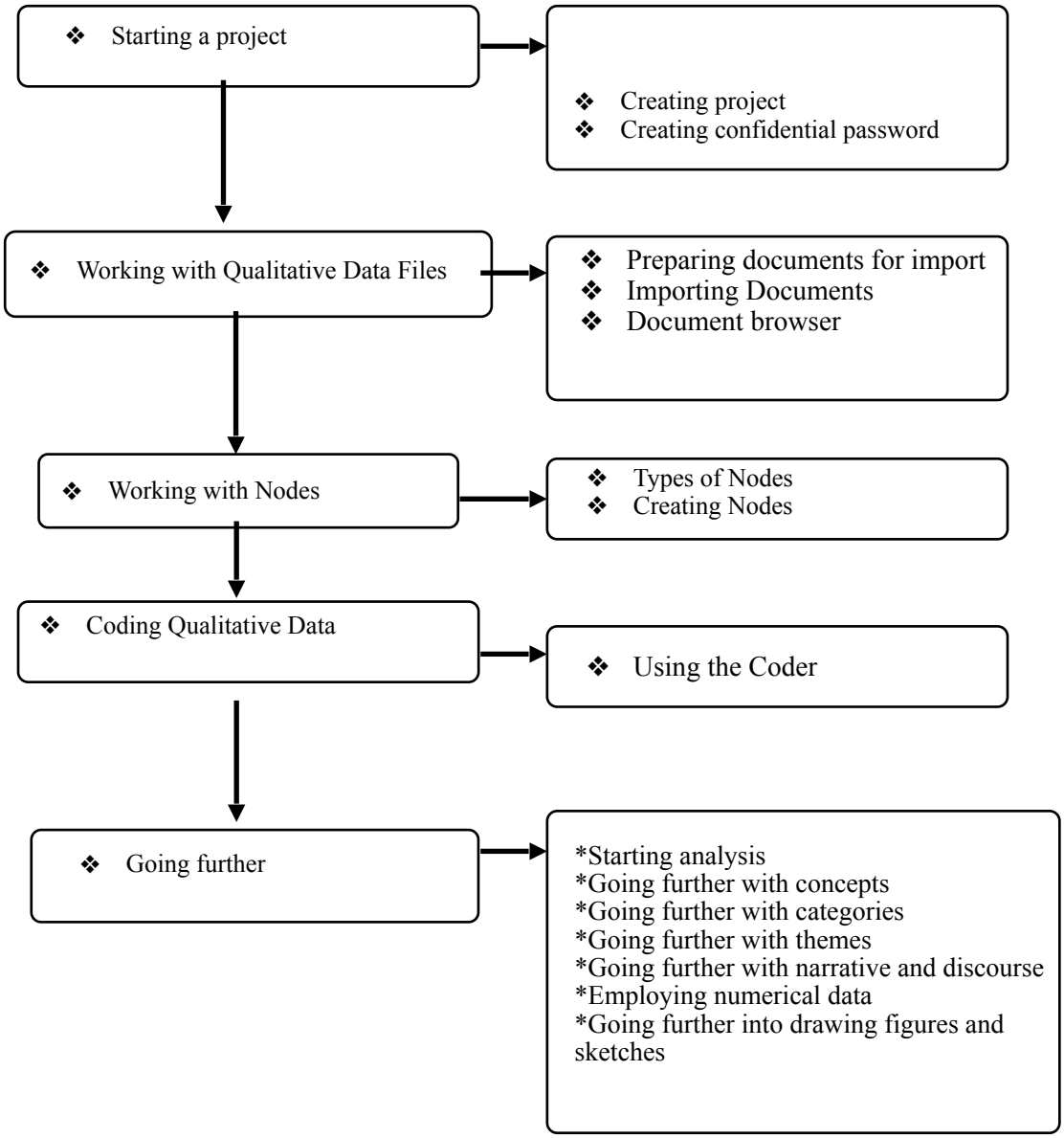

Fig 3.5: The process of using NVivo software for coding

3.8.2 Quality Assurance

Questions of quality in this study will be raised by the nature of data that has been relied upon and the process of its analysis.

The data relied upon is the documents that state the actual regulations as communicated to the consuming public. There does not exist a more authoritative source of the regulations beyond what exists in the public domain. Inconsistencies in that statement and any ambiguities or contradictions still have the authority to guide or compel action and must thus be seen in that framework.

3.8.3 Using NVivo Software for Data Analysis

The computer software application NVivo was utilised in this part of the research. NVivo is a Qualitative Data Analysis programme which has been recommended by research experts. (Adu 2019; Saldana, 2016). The advantages of using the software were the possibilities it offered for improving the quality of the research. Specifically, it makes the tasks faster allowing the researcher to cover more ground. In this instance, it allowed for a comprehensive approach to the process: every clause of the building regulations for Kenya was analysed and thus dispensing with the need to take on a sample.

The analytical process involves coding of the data available. The initial interaction with the data required giving a code after consideration of each clause for the meaning may be determined. These codes were then collected into categories and later further reduced to themes.

There are five critical processes in which NVivo eases analysis of qualitative data. (Bazeley, 2007) . These tasks include:

- Managing the data: by organizing the various data documents that are being analyses. In this study, these included the various sections of the published documents of regulation.
- Manage ideas: in order to understand the conceptual and theoretical issues generated in the course of the study. This makes the generation of codes much easier.
- Query data: by posing several questions of the data and utilizing the software in answering these queries and where necessary generating statistics and summaries. “Results of queries are saved to allow further interrogation and so querying or searching becomes part of an ongoing enquiry process” [Bazeley, 2007].
- Generating Visualisations: by creating charts and word clouds to demonstrate the relationships between the conceptual and theoretical data.

- Reporting: by utilizing the data collected and the result found from the analytical processes to formulate transcript reports about the study conducted.

3.9 Data presentation

The process of analysing the data in this study starts with a process of coding and culminates in the creation of categories and themes.The emergent themes provide the basis for the drawing of conclusions and forming the framework of a theory.

This outcome is envisaged by the methods of qualitative analysis that are applied in this work. The data therefore is presented as themes which follow from the categories that have emerged from the initial coding process.

3.10 Summary

In this chapter I have sought to lay down the methodology of research that leads to the objectives set out for the study. The process is anchored on the choice of an interpretive approach and the subsequent application of qualitative methods to analyse the data.

The process of document analysis has been explained and the specific methods used to analyse the data have been set out. The utilisation of data analysis software has been explained.

The rationale for using an interpretive approach has been explained. This justification puts further focus on the nature of inquiry this is and helps put into proper perspective the research methods that I have applied in the study. Through these methods this study has helped to advance the options available to scholars in this area of academic endeavour and as a result, I envisage, it will help to spur on research efforts.

I have also clarified what may be possible biases arising from the background of the researcher and explained why these are not available and may indeed enriched the value of the study. This chapter

has therefore laid a firm basis with which to embark on the actual analysis which follows in the next chapters.

The following chapters will present the outcomes of this enquiry.

Chapter 4 **Evolution of the Building Regulations**

4.1 Introduction

This chapter seeks to look into the development and rationalisation of the building regulations in the effort to discover the underlying philosophy that ties them together. Through the examination of pertinent documents using a hermeneutic analysis, the nature of the universal transaction of regulation will be explored. The discussion is thereafter built from a survey of the theory behind this transaction. This part attempts to discharge the first of the objectives laid down for this study.

An enquiry into underlying philosophy requires that a connection be established with a fundamental truth or position that would demonstrate linkage between practise or tradition, with its essential necessity. In the present case regarding building regulations, the objective is to discover what is the basic truth that give birth to the regulations and therefore connect them to our fundamental existence. The method of hermeneutic analysis is utilised for this purpose.

The technique used for this is document review and content analysis. The strategy to get to the essence of these documents is interpretive through a close reading of the content of each document.

4.1.1 Re-Defining "Regulation"

In Chapter one a definition of Regulations was offered and the observation made that the word is both a noun and a verb in the English language. These definitions of "regulation" as a noun, converge on the notion of creating limits or constraints on a right, and the repository of this responsibility within an authority. David Levi-Faur's (2010) states that "regulation creates, limits, or constrains a right, creates or limits a duty, or allocates a responsibility." It can come in many forms including legal restrictions, contractual obligations, self-regulation, co-regulation, third-party

regulation, certification, accreditation or market regulation. Regulation is basically ensuring that a law or legislation is put into effect and the details of how it is put into effect.

Within the literature, scholars differ only marginally about the meaning of the term “Regulation”. Both contemporary scholars (Orbach,2010; Levi-Faur,2010;) and earlier thinkers (Mill, 2019; Hobbes, 2017;Paine,1776) have grappled with the nature of this action. The intuitive understanding of the term is government intervention in the private domain or a legal rule that implements such intervention. Regulation therefore is state intervention in the private domain, which is a byproduct of our imperfect reality and human limitations. (Orbach, 2012). Government intervention is necessary because society is not perfect and our vices need to be restrained (Paine,1776).

In this research, the use of the term “regulation” does not deviate from the normal usage within the English language. The immediate context of its use should, to a reasonable level, reveal the tense that has been applied.

4.1.2 Framing the Structure of the Inquiry.

To uncover the essential nature of the building regulations, a framing of the question is necessary. Such a framing disaggregates the inquiry and guides in the selection of sources that may shed light on the question.

Further, we note that the philosophy that underlies the building regulations is developed over time. An analytical exploration of key moments in this historical journey, is therefore adopted to understand the motivations and aspirations that started the path to where we are. This is a critical part of the enquiry.

To satisfy this part of the enquiry, critical historical documents have been selected for close reading and analysis. In this case, and building on the insights developed in chapter 2 of this study, the work that produced the first Public Health Act and the activities around it are acknowledged as a critical

turning point and the research focusses on this period for insights into the formulations of the regulations.

The research also acknowledges that this subject has benefitted from enrichment over time. In the present period, international conventions relating to disaster reduction are a useful guide to the state of the matter. International conventions represent the current understandings and the conventional wisdom on governance and regulation, and are a crucial anchor in the formulation of building regulations.

4.1.3 Key Documents in the Analysis

In the pursuit of these intentions, key documents have been selected for close reading. The criteria for this selection is the preponderance of those documents in the literature and therefore the probability that they may contain essential insights towards the research question. Table 4.1 summarises the selected documents for this task.

Table 4.1: Key texts for analysis on the philosophy of the building regulations.

Text	***Author***	***Full Title of Text***
THE THEORY OF REGULATION		
General Theories of Regulation	den Hertog, Johan	*General Theories of Regulation*
GENESIS AND HISTORICAL DEVELOPMENT		
A History of Public Health	Rosen, George Elizabeth Fee (Introduction), Pascal James Imperato (Foreword)	*A History of Public Health*, (Revised Expanded edition)
City Chaos, Contagion and Social Justice	Morley, Ian	*City Chaos, Contagion Chadwick and Social Justice.*
Chadwick Reports	Edwin Chadwick	• *•Report on an Inquiry into the Sanitary Condition of the Labouring population of Great Britain (1842)* • *•The Report from the Poor Law Commissioners on an Inquiry into the Sanitary Conditions of the Labouring Population of Great Britain (1842)*
CONTEMPORARY PROCESS		
Reform of Building Regulation	Productivity Commission (Australia Government),	*Reform of Building Regulation*. Research Report, Productivity Commission, Melbourne.
Sendai Framework for Disaster Risk Reduction	United Nations Office for Disaster Risk Reduction (UNISDR)	*Sendai Framework for Disaster Risk Reduction 2015 - 2030*
Hyogo Framework for Action	United Nations Office for Disaster Risk Reduction (UNISDR)	*Hyogo Framework for Action 2005 -2015*

The Yokohama Strategy	United Nations Office for Disaster Risk Reduction (UNISDR)	*The Yokohama Strategy for a Safer World: Guidelines for Natural disaster Prevention, Preparedness and Mitigation*

The research extensively examines the available guides represented by the frameworks developed in international conventions. In this respect, the research leans heavily on the Sendai Framework on Disaster Risk Reduction 2015-2030 (UNISDR, 2015) even as it acknowledges that this document builds on similar earlier work represented by the Yokohama strategy (UNISDR,2000) and the Hyogo Framework.(UNISDR,2005)

As a complement to this historical analysis, the study looks into the broader process of regulation in its generic nature to seek to understand the relationship represented by the process of regulation. This pivots the enquiry towards theories of regulation. Key thinkers in this area are sought for analysis and in particular one document has been selected for an in depth treatment.

A well-documented process of reforming building regulations was available for the research. The Australian process undertaken by the Productivity Commission offers an opportunity, not only to study a contemporary authority in action, but also to validate the findings from the early part of the inquiry.

To advance the objectives of the chapter, the selected documents are broadly divided into three categories, and are then analysed and summarised in turn.

The first category deals with the philosophy of regulation as a generic process. The objective is to understand the logic that underlies the institution of regulations in society. The expectation is that through this analysis, clarity will emerge about the societal expectation of the regulation process. The focus of this section is treatise by Johan den Hertog, *General Theories of Regulation* with commensurate reference to other sources.

The second category traces the history of the regulations. Three pieces of writing have been selected here for the main inquiry with other sources referenced along the way. The focus is on the genesis and early development of the current form of the regulation to attempt to uncover the original thoughts that shaped the regulations. In this respect the work of George Rosen, *A History of Public Health*, (1958) is selected as a key reference alongside the work by Ian Morley, *City Chaos, Contagion, Chadwick and Social Justice, (2007)* and two reports from the period leading to the first Public Health Act.

The third category of selected documents relate to the contemporary situation. These are mainly the aggregation of international conventions that have focus on risk reduction and thus give a framework to think about and act on the process of regulation today. Those documents reveal the thinking about regulation that would guide governments around the world in formulating their own regulations. The International convention documents are the *Sendai Framework for Disaster Risk Reduction 2015 - 2030*, *Hyogo Framework for Action 2005 -2015* and *The Yokohama Strategy for a Safer World (2000).* These are supplemented by looking at the report of the Productivity Commission of Australia titled *Reform of Building Regulation* of 2004.

4.2 The Necessity of Regulation

The question of why regulation is necessary in society ought to lead to a clearer understanding on what any set of regulation is seeking to achieve. Borrowing on the casting of this question from the discipline of economics we assess the formulations of the market place to see the absolute necessity of what amounts to a constrain on human actions.

In this respect the research has leaned heavily on the treatise of regulation titled General Theories of Regulation by Johan den Hertog of the Economic Institute /CLAV, Utrecht University, (Herzog, 1999) for the broad understandings of the nature of regulation. An in-depth analysis of this paper forms the foundation of the understanding in this research.

In this paper, the distinction is made early on between economic regulation, and social regulation. Economic regulation primarily targets monopolies and market structures characterized by limited or excessive competition.

On the other hand, social regulation is defined in this paper as comprising regulation in the area of the environment, labour conditions (occupational health and safety), consumer protection and labor (equal opportunity and so on). Other sources, more forthcoming indicate it “refers to the broad category of rules governing how any business or individual carries out its activities, with a view to correcting one or more “market failures.” A classic way in which the market fails is when firms (or individuals) do not take account of the costs their activities may impose on third parties” (Litan, 1983)

In Herzog's framework, social regulation is seen as the responsibility of the government and is considered a contributor to social cohesion and stability. It encompasses the regulations established by the government to protect the public interest and maintain social cohesion. Within this construct, social regulation addresses externalities, such as pollution, and information problems related to approvals and standards (Hertog, 1999, p. 224).

4.2.1 Public Interest Theories of Regulation

The first defined target in the theory of regulations is the public interest. Here, public interest is seen as the best possible allocation of scarce resources for individual and collective goods. We would be interested in the meaning attached to “scarce resources” as this includes land resources. When such land is public it can accurately be referred to as a collective good.

Once again Government is seen as the agency that helps achieve efficiency but more important, government is seen as “the instrument for overcoming the disadvantages of imperfect competition, unbalanced market operation, missing markets and undesirable market results”. (Hertog, 1999, p225)

This formulation underlines that the real target of regulation is the distortion of value through varied agencies who are players within the market.The need for a collective organisation - as opposed to individual organisation - is therefore pegged on the pursuit of efficiency.

The reliance on the involvement of the government to achieve the ends of regulation, fundamentally relies on the power of the state to coerce. (Stigler, 1971) This is a resource that the state does not share with other entities. The pursuit of efficiency thus benefits from the utilisation of the state and therefore avails valuable benefits to the population. (Posner,1974).

4.2.2 Unbalanced Operations

A further target in the public interest theory is the contribution to the stabilisation of operations. In the Hertog construction of this thought, imbalances are seen to arise especially from destructive and excessive competition. Over capacity is also identified as another source of the imbalance.

> "Over-capacity situations can also arise when the production capacity is adjusted to the demand during peak moments or peak periods. Examples are peak loads in the rush-hour (buses, underground railways and trains), during the harvest in agriculture (trucks) and during the tourist high season (touring cars, aircraft)." (Hertog, 1999, p227)

The imbalance of information, between critical players in the market, forms another strong justification for instituting regulation. The imbalance occurs through hidden information or an asymmetric distribution of information. By instituting a regulatory process, minimum standards and the utilisation of professional skills can be enforced.

This asymmetry of information gives rise to what is described in the paper as a moral hazard - a situation where parties may misuse their information advantage. Such a situation can create real danger when the information may have a bearing on safety and adequate provisions of critical installations.

This market imperfection represented here by the asymmetry of information, justifies the scheme of regulation "the existence of which supplies a complete justification for some regulation…." .Government is seen to be benign and capable of correcting these market failures through its power and capacity to compel action (Posner, 1974; Shleifer, 2005).

4.2.3 External Effects

The paper identifies external effects as a possible negative outcome of inefficient allocation of resources and cites this as a further justification for regulation. An example of this situation is the discharge of waste material that could end up contaminating drinking water and thus causing incurrence of cost to purify the water. In such a case government can intervene with regulation to internalise the external effects.

A related justification is the provision of *public goods*. These kinds of goods cannot exclude people from their consumption - either it is impossible or too expensive to effect an exclusion. The consumption of such goods is also not at the expense of another person. Hertog gives examples of these goods as lighthouses, public order, defence, street lighting and sea defences, and television and radio signals. Government regulation is necessary for establishing the optimum quantity of the goods concerned, and for enforcing the payment of these goods.

4.2.4 Undesirable Results

A final reason for regulation as laid out in Hertog's paper, is significant, though probably not as clear cut as the other reasons above. This is the need to correct or prevent undesirable market results. The key thoughts are communicated as follows:

> The correction of undesirable market results can furthermore also be considered desirable for other than economic reasons, such as considerations of justice, paternalistic motives or ethical principles. In that case, tradeoffs can arise between, for example, economic efficiency and equality: incentive effects of redistribution can result in a decline in the level of individual utility.

and also in this extract:

> According to this last view, regulation can be accounted for as aiming for a socially efficient use of scarce resources. Examples of laws and rules intended to prevent or ameliorate undesirable market results are a legal minimum wage, maximum rents, cross-subsidies in postal delivery, telephone calls and passenger transport, rules enhancing the accessibility of health care, rules guaranteeing an income in the event of sickness, unemployment, disablement, old-age and so on.

4.2.5 Limitations of the Theory

The general theory of regulation helps to get to the essential purpose of the regulatory process. However, in Herzog's paper four areas of criticism are cited. The identified areas seem to relate more fundamentally to the operations of the economy and do not really invalidate the broad thrust of the theory.

The first of the areas cited is *market failure*, with the suggestion that the market is broadly able to correct itself. In this research, the historical development of building regulations negates this observation although this might not apply to other aspects of the economy.

A second line of criticism is the assumption that government regulation is effective. This is a valid viewpoint in a situation of rigid regulation. A mitigation would seem to be an expansion of the space available for interpretation and action, where through creative processes different outcomes are offered to deal with design challenges.

A third line of criticism offered is the economic efficiency aspect. This line of criticism holds the position that an economic viewpoint is the determinant of efficiency, degrading the aspect of social benefit and social efficiency of regulation. These two; economic and social efficiency, need to be weighed against each other.

A final point of criticism made is the incompleteness of the public interest theory. This line suggests that the theory does not come up with predictions that can be tested by empirical economic theory.

These criticisms lead to further reflection, and what Herzog's paper has termed "a more sophisticated version of the Public Interest Theory". The key observation is captured here:

> This sophisticated version of the public interest theory does not therefore require regulation to be perfect. It does, however, assume that market failure exists, that regulation is the most effective means of combating it and that regulation does not continue to exist once the costs exceed the benefits. (Hertog, p24)

For the purposes of this research, the prevalent viewpoint on the public theory of regulation is sufficiently weighty to give a direction to the search for an underlying philosophy. Other lines of inquiry on this question will balance the overall outcome to arrive at the central tendency in the quest.

4.2.6 Summary

The subject of government regulation is a much-studied area especially among economists. The fine differences in approach and understanding are matters of great debate and incisive thinking. (Sigler, 1971; Posner, 1974; Shleifer, 2005; Herzog, 1999; Corley,1998). The bedrock position however remains the need to protect an interest that transcends the immediate players, and this usually is the public interest. The soundness and relevance of this approach is attested by the pervasiveness of government regulation in our lives.

Questions about the process point to grey areas that still need to be clarified. "How much regulation of a particular activity is appropriate? Does the nature of the activity being regulated, or the characteristics of a country, influence the optimal choice? Is the level of regulation we observe in fact an outcome of efficient social choice, or are other factors as or more important?" (Shleifer, 2005). Important as these questions are, and may become, it does not mask the broad thrust already identified of the fundamental purpose of regulation. By exploring various lines of inquiry, a more comprehensive understanding of the underlying philosophy of regulation can be achieved.

4.3 The Trajectory of the Historical Development of Building Regulations

4.3.1 The Impact of Enlightenment Thinking

The search for the genesis of the current formulation of building regulations is built on the close reading of pertinent historical documents that have documented the early developments that gave rise to the content of the regulations as we know it today. The purpose of this approach is to connect with the genetic thinking of the regulations and in this manner to enrichen the understanding on the underlying philosophy.

The selected text in this endeavour is George Rosen's book *A History of Public Health* (Revised Expanded Edition, 2015). I have judged this book to be an excellent account of the developments in question. This perspective is complemented by additional reading of several other documents including *City Chaos, Contagion and Social Justice,* by Ian Morley,(Morley, 2007) and *Chadwick's Report on Sanitary conditions.*

The thinking about public health that emerged in the regime of acts passed in the mid 19th Century was deeply rooted in enlightenment thinking and the supremacy of reason and science.

The Age of Enlightenment played a pivotal role in the evolution of public health, as it emphasized the belief in the social value of intelligence, the potential for social progress through reason, and the transformative power of education and free institutions (Fee, 2015; Rosen, 2015).

The coding into law of the various concerns in public health highlight "the belief in the supreme social value of intelligence, the idea that, through reason, man could design and even guarantee social progress, the conviction that education and free institutions could lead to human perfectibility" (Fee, ibid).

For the players in this critical phase of development, public health was seen as a social matter that overrides the whims of any individual. What was at stake was the fate of the population. The science had occupied an unassailable position and society had to follow the dictates as given, for what was seen to be the good of all. This was "a humanitarianism of the successful, tempering sympathy with a firm belief in the sober and practical virtues of efficiency, simplicity and cheapness" (Rosen, *2015*).

The leap of thought that allows for the application of available knowledge, and the societal acceptance of the value of doing so, is an important part of the regulation story. This is what allows public health to be a truly *public* matter and for it to be addressed as such.

4.3.2 Early Concerns in Building Regulations

The earliest significant expressions of building regulation found in literature. is in the laws laid down by King Hammurabi in the 3rd century BC. These laws were concerned overwhelmingly with the structure of the building and the need to preserve life when the structure fails. In Chapter 2, we have quoted directly from these regulations.

In relatively more modern times, the London Building Act of 1667 provides an indicator of the development of these concerns. The Act followed the Great Fire of London in the previous year, which had destroyed most of the city and thus created a great desire to develop a more reassuring system of ensuring the survival of structures.

Literature on this incident indicates that a great part of the city of London was destroyed by a fire in the 1666. Although few people died, the fire raged on for about four days and had a great impact on the economy and general life of the city.

The question about how the fire could have been prevented - and how similar events in future would be mitigated - turned to the structures, and especially the materials of construction. In this

manner, the first firm guidance on what materials are appropriate to build was laid down. The London Building Act suggested the critical areas of attention.

The significant aspect of this fire arises from the fact that the urban context of the incident was what informed the reactions. It was not so much how to prevent a building from catching fire, but about the spread between buildings. The density of the settlement created the risk of many people being caught up in the aftermath of a fire in a single dwelling or building.

The strictures that were laid down by the London Building Act were primarily focused on controlling the spread of fire. The Act sought to prioritize the preservation of the city, but did so by focussing on the decisions made by individuals and the implications inherent in the sum of those decisions. In this it was a harbinger of the developments that followed later.

4.3.3 Concerns of the Early Sanitary Campaigners

The overwhelming concern during the early part of the nineteenth century was to address the crises that had engulfed the new industrial revolution towns revolving around disease. In his paper, *City Chaos, Contagion, Chadwick, and Social Justice,* Ian Morley has traced the events and reasoning that led to the enactment of the first Public Health Act in 1848. (Morley, 2007) A close reading of this paper adds significant insight in this study.

The observation that succinctly sums up the crisis that was crying for resolution was that “Urban society was ailing and in need of improvement. The British city was a setting confirmed as unsafe to one’s health” (Morley, p8). The real cause of this misery had not been clearly expressed then, the deterioration of health within the population seemingly confounding all, particularly because there was material progress which would have been expected to lead to a universal improvement in urban health.

It was however easier to link the situation to the explosion in urban growth. By 1841 the quantity of urban dwellers was approaching 50 percent of the nation’s total. Changes were noticed in the

physical character of the urban places and “hitherto open areas at the urban fringe being replaced by multitudes of high-density back-to-back terraces” (Morley, p2).

Not only were "diseases of civilization" such as tuberculosis noted as having a much more widespread incidence than in previous times, the growth of "localities of pauperization", that is, quarters deficient in hygiene yet filled with slums and manifestations of poverty, drew aghast depictions of contemporary working-class life and produced disquiet among medical professionals about the well-being of urban citizens. (Morley, p3). We see here that society’s awareness was now being directed at the shared predicament that was wrought by the situation.

4.3.4 The Fear of an Existential Threat

Such lamentations as quoted above were revealing a deep-seated fear that society itself was under threat. There was a concern about the nature of the cities and the potential volatility of the industrial age. The prospect of the nation being lost on the character of the cities was raised. The cities had, it seemed, “under the aegis of economic transition, metamorphosed into epidemiological time bombs, environments greatly lacking in humanity and justice.” (Morley, p4).

The situation that obtained in the cities is described in terms such as “hellish”, “brutish”; the people are “turned almost into a savage”, the situation is characterised by “grime and hardship” (Morley, p4).

4.3.5 The Spatial Dimension

The situation that obtained in the industrial cities, was being complicated by the prevalent poverty within the population caused apparently by a low wage economy and government reluctance to tackle the problems. Exploitative merchants hired unqualified builders to rapidly construct back-to-back terraces, a small housing form lacking in basic utilities like clean water and sewers but erected solely as a machine to manufacture rent”. (Morley, p6).

By and by, the spatial aspect was being brought more into focus. By 1830, the connection was already being made between impoverishment, the slum environment and endemic fever. The physical state of the cities had become a moral issue and "the human cost of society's unmanaged urban development was unmistakable". (Morley, p9).

A cholera outbreak in the early 1830 instigated a new dynamic "to urban living and the subject of health". There was virtually no informed understanding of this disease. The disease engineered unparalleled fear. Morley reports that it was a "psychological sledgehammer to material progress and all the perceived benefits of modernity." (Morley, p12).

In the book by George Rosen, the efforts to effect schemes of civic improvement are reported. These schemes involved the working on the physical environment. In the early parts of the nineteenth century:

Deteriorated and obstructive buildings were pulled down, and streets were drained, paved, and lighted. Narrow, tortuous thoroughfares were widened and straightened. Brick buildings replaced timbered houses, with the result that some horrible slums disappeared. (Rosen, 2015)

Whereas these efforts were positive for the society, there were difficulties in sustaining them, and mortality continued to rise. In the account by Rosen, he attempts to explain the situation thus:

Complicating the situation was the circumstance that the community recognized little corporate responsibility for the well-being of its members. The old order that had come down from the Middle Ages was in the last stages of disintegration, and the new order was just making its appearance. One consequence of this process was that urban government in Britain throughout the eighteenth century was in a bad way. (Rosen, 2015)

Governance was identified as the missing link in this crisis. Corporate responsibility for the well-being of society, was lacking.

4.3.6 The Public Health Act: Harbinger of the Building Regulations

The efforts over many years to improve the civic environment and reduce the suffering of the population, culminated in the writing and introduction of the first Public Health Act. It is however clear that several other commissions and task forces had helped to build up to this point.

Our task in this research is to establish this linkage between the institution of the building regulations and the critical concerns that gave rise to the reform efforts. In the readings of the historical documents at hand, the critical milestones are clear and unmistakable in their propagating theme.

The breakthrough moment would seem to be the document authored by Edwin Chadwick entitled *The Report from the Poor Law Commissioners on an Inquiry into the Sanitary Conditions of the Laboring Population of Great Britain*, published in 1842.

Edwin Chadwick was one of the architects of the 1834 Poor Law, which was based on the principle that making the provision of poor relief so unpleasant would put off all but the most desperate. Whilst working as secretary to the Poor Law Commissioners he investigated the issue of sanitation amongst the poor. .In the analysis of this report by Rosen, it is noted that "the report proved beyond any doubt that disease, especially communicable disease, was related to filthy environmental conditions, due to lack of drainage, water supply, and means for removing refuse from houses and streets."

Edwin Chadwick's report outlined in detail the wretched social and environmental conditions within the world's first industrial society. The Chadwick Report, the first such national investigation of its kind, highlighted a number of now widely accepted phenomena concerning economic development, urbanization and health within industrial settlements. For its time, the report was a monumental step toward accepting and then dealing with the social costs of economic progress.

Following on 1842 report was the institution of the Health of Towns Commission. A select committee of this commission proposed “the appointment of permanent boards of health in all urban communities over a certain size, the appointment in large towns of an inspector to enforce sanitary regulations, a general sewerage act, and a general act to regulate all future building.” (Rosen, p121).

Morley observes that ‘the Chadwick Report, a graphic exposé of “the extent and operation of the evils” that contributed to the spread of disease in urban communities and “the means by which the present sanitary condition of the laboring classes may be improved,” was a milestone in social history and the quest for public sanitary reform.’ (p17) Morley also take particular note of the use of language, crediting the report with “masterful control of language’ ostensibly to prompt political persuasion.

To illustrate this point, Chadwick undoubtedly realised that to achieve the end of instigating urban betterment, great value was to be obtained by focusing on matters of engineering, e.g., relating to aspects of health. Therefore, by dealing with matters of a range of urban and moral conditions, Chadwick could promote his public health agenda. In this way, not only could he instigate municipal interest in a variety of matters relating to urban health and improvement, but what’s more, he was able to navigate around what were previous litigious matters relating to public health, such as questions of need and cost relating to the implementation of drainage systems. (Morley, p17-18)

It can be observed from this paper that the broader implications of the matters of sanitation were in the consciousness of the actors. Poorly planned environments with bad health correlated to people’s immoral behaviour. Sanitation was seen to improve the overall structure of society by defusing decadence and rowdiness in the community.

This work found its culmination and legal fruition when a suitable legal balance between local and national governments interests was found. The Public Health Act was passed in 1848. According to Morley "with the passing of the Public Health Act, for the first time the industrial world provided a proactive system of public health and required local governments, which became local health authorities, to guarantee minimum environmental quality". (Morley,p19).

4.3.7 Allocation of Responsibilities

The balance of responsibilities in the execution of public health issues is a matter of great debate in the genesis of the basic law. The development of the Public Health Act in England in the mid-19th century was a critical milestone in instituting public legislation towards the creation of healthy, habitable environments.

An examination of the key markers in the process of birthing this law offers insights into the driving forces in the original construct. This in turn sheds some light into the hierarchies that are embedded in the regulation and in the process of articulating them.

Whereas it is possible to trace aspects of building regulation back into the biblical times, the current form of the regulations and their focus has its roots in the late 18th and early to mid 19th century. The philosophical underpinning in that period was provided by what came to be known as the enlightenment thinkers. It therefore makes rational sense to endeavour to have an understanding of this dynamic.

The thinkers of the enlightenment sought to bring forth a new understating of the human condition by an application of reason and science. Enlightenment was fundamentally about reason and science. Though it may be far outside the scope of the current study to analyse in depth the works of these thinkers, we take note of the broad thrust in the works of John Locke, Thomas Hobbes and also J.J. Rousseau.

Locke believed that individuals acting in their own best interests, would gravitate towards a government. Without government to defend them against those seeking to injure or enslave them, Locke further believed people would have no security in their rights and would live in fear. Individuals, to Locke, would only agree to form a state that would provide, in part, a "neutral judge", acting to protect the lives, liberty, and property of those who lived within it. (Locke,1690) Thomas Hobbes who belongs to the scholarly Social Contract school of thought, believed that individuals, of necessity, will sacrifice some of their freedoms for the good of all. This would result in the establishment of the state, which would create laws to regulate social interactions. Human life would thus no longer be "a war of all against all". (Hobbes, 1651).

The purpose of the Public Health act was seen as a way to translate the ideals of the enlightenment to public policy and legislation. The question that created the urgency of the situation in the industrial towns was the cause of the misery and diseases that were all around. It was to be a logical build-up of understanding arising from rational enquiry. The social problems of industrialisation motivated the analysis of the health question and through a series of measures and studies, a basis for action was created.

The need for public action for the necessary intervention was controversial. It was also not generally accepted that the public bodies had that responsibility. In this respect no structures existed to deal with public sanitation. (Hamlin,1998). What seems to have tipped the balance of opinion was the mortality rate within the population which was caused by these unsanitary conditions. The diseases that were ravaging the towns, were believed by the champions of the new laws, to have physical causes in poor urban drainage which fouled that air and caused disease. (referenced by Pelling M.; *Cholera, Fever and English Medicine, 1825-1865*) This was a critical anchor for the further development of the regulatory environment; that it is primarily for the preservation of life that public action was justified in the first instance.

The first Public Health Act enacted in 1848 accepted the spirit of public responsibility and therefore created structures that made the state the guarantor of the standards of health and environmental quality. (Hamlin, ibid). This role for the state was justified by the observation that “many of the problems affected the population as a whole”. (Hamlin, ibid). These were concerns for the health of the population not individuals. This creation of a role for government was underlined by the realisation that public health could not be guaranteed without a major involvement by the public bodies. As much as the act did not go much further that the provision of a constant water supply and efficient removal of sewage, it was a significant construction of the balance of responsibilities for the health of the public.

Proper sanitation was not the entirety of the concerns that justified the institution of the new laws. The health of the society was affected in other ways, causing “social diseases” as well as biological disease, with alcohol being an attraction for desperate people. In this respect the new laws were seen to deliver “a happy, healthy and docile proletariat”. (Hamlin, 1998).

4.3.8 The Emergent Role of Science

In introducing new laws during the industrial revolution, science was used as a justification and was in itself a driving factor. The prevalent beliefs that disease was caused by “miasmas” in the air was being overtaken by a better understanding of how disease was caused. The role of clean water supplies, better handling of waste water - especially the need to prevent contamination - and the removal of refuse, were getting to be better understood.

The formation of Boards of Health created the structure for applying the superior understandings to the general conditions. A major outcome as observed by Chadwick, was the extinction of children diseases; measles, scarlatina, typhus and diptheria, which reduced the death rate to “less than one third of the death-rate prevalent in the general population”.

Experience in the military was a critical point of reference. The particular breakthrough in this respect was achieved in the Crimean war where the application of science was credited in the reduction of the death rate where it could be observed that “the saving in life by sanitation is immensely greater that the losses of life by war.” (Chadwick,1889).

The significance of these developments was that superior understanding of the science of disease, allowed the creation of moral authority in instituting a public system of sanitation and was a major step forward becoming in the process an informer of the spirit of these new arrangements.

The knowledge emanating from science was compelling and therefore the urge to apply it was strong. The mortality rate in the population provided the backdrop for this action and created the environment for the scientists to implement their expertise.

The second report by the Royal Commission on the Health of Towns in 1845, effectively endorsed the technical solutions proposed by Chadwick. These included a universal constant water supply, networks of high velocity sewers and the recycling of wastes.

4.3.9 Discussion

The overwhelming concern toward the end of the nineteenth century was for the creation of an environment that could sustain life. The prevalent mortality rate was not acceptable and its reduction was seen as the big positive outcome after the improvement of sanitary conditions (Chadwick, 1889). It was in the better treatment of water and especially the waste water that expectations were placed for even further advancement.

Such corrections as prevention of stagnant water and the utilisation of a sewer system, were credited with improving the life expectation in the population and lowering the death rate significantly. But these measures were also accompanied by an enforcement system of inspectors. Concern was directed to making sure that a factory inspector would in fact cover the sanitary conditions as well and be able to detect and act on any symptoms of disease. Broadly, one of the

celebrated outcomes was the reduction of the main children diseases and the consequent reduction of the mortality rate among the children.

This direct cause and effect construct of the early sanitation regulations lays a powerful indicator of the direction the campaign would take. The concern for life was at the centre of the thinking process and was conceptualised as a benefit to all society.

To this concern, an extra dimension was introduced; the role of science. Arising from the benefits that were seen in the army - especially the Crimean war, where improvement in sanitary conditions were seen to raise recovery rates - science was seen as key and significantly so. The observation was made (Chadwick, 1889) suggesting that “the saving in life by sanitation is immensely greater that the losses of life by war”. Such an observation was bound to have a profound effect on how sanitation was understood.

Whereas these measures focussed on water and waste water were seen to be crucial it was dawning on the campaigners that indeed there are other dimensions to the matter. Chadwick makes early comment of the role of ventilation and the need for clean air.

A concise summary of the viewpoint is provided by the observation that “low sanitary conditions of populations are everywhere the sources of irritations, of despair, of disorder; whilst high sanitary conditions are the sources of satisfaction, of political security, prosperity, order and peace”

The work in England involving Edwin Chadwick was not isolated. In Germany, similar efforts are discerned in the work of Max Joseph Pettenkofer. Pettenkofer, a chemist and hygienist, is described as an apostle of good water, fresh air and proper sewage disposal. (Winiwater,*et al*. 2016).

One of the prevailing arguments of the day that Pettenkofer focused on was the relationship between sewage and the health of a population. In one of his first major projects in his home city of Munich, Pettenkofer advocated for the development of running water throughout the city. He also

emphasized the selection of the Mangfall River, not the readily at hand and highly polluted Isar River, as the source of the city's drinking water. (Winiwater, *ibid*. 2016).

4.3.10 The Enlightenment of Society

For the purposes of this research, the critical point is that public health was seen as a social matter that overrides the whims of any individual. What was at stake was the fate of the population. The science had occupied an unassailable position and society had to follow the dictates as given, for what was seen to be the good of all. This was "a humanitarianism of the successful, tempering sympathy with a firm belief in the sober and practical virtues of efficiency, simplicity and cheapness" (Rosen,2015).

4.4 The Building Act and the Building Bylaws

The emergence of a building code, succinctly focused on the act of building - as opposed to the more generalised public Health- was a further affirmation of the prevalent view point regarding the primacy of the laws and regulations that were being put in place. The scope of these laws remained focussed on those areas that had a direct impact of life and the quality of life. It is the existential dimension that provided the underlying philosophy of these early efforts at building control. The first model by laws issued by the Local Government Act Office, sought to control structure, the space around buildings and their drainage and the dimensions of streets (Gaskell, 1983 quoted in *Planning by Consent: the Origins and Nature of British Development Control*). Dimensional standards were imposed for all new developments.

The twin themes of safety and health which came to characterise building regulations had taken shape at this time. Significantly, so had the enforcement regime that had now created a role for government. .Although bylaws were meant to be for local applications, the advisory role of the Local Government office ended up creating a role for the central government in the enforcement of building regulations.

These efforts were a success. Controlled building brought about an improvement in housing (Ley). The health of the people was positively affected by the focus on sanitary conditions. The urban death rate fell and the motivation to build substandard houses all but disappeared.

The purpose of following this narrative and establishing the path that buildings regulations took, is to distill the fundamental intention of the regulations. When applied in an urban situation, this hierarchy of concerns is critical in determining where the focus needs to remain. It provides a framework to understand the structure of the regulations that we apply today.

In summary, the build up over decades to the institution of the public health act which gave birth to the building regulations pulled in strands of thought from a spectrum of concerns. It is however clear that at the core of it all was the very real threat to the existence of cities and particularly the challenge of ensuring health populations. There were many instances of breakthrough thinking that became the basis for the actions that followed.

The first of these was the dire need for action. It is clear from the readings that a sense of urgency characterised the search for a solution to the crisis in the cities. The general understanding was that society was under a catastrophic threat and the effort to save it must succeed. Anything short of that goal would jeopardise the very concept of urban living.

The aim was therefore to devise a mechanism that was sure to deliver the environment that would sustain life. We can take this as the basis of all the subsequent developments of the regulatory framework. In the search for a connection between this framework and the desire for urban resilience, this is a critical revelation.

4.5 Lessons from International Frameworks

Contemporary benchmarks for creating regulations that help a

vert disaster can be found in conferences that have been held around the subject. In this section, three such conferences organised as the United Nations World Conference on Disaster Risk

Reduction, are reviewed. An examination of the deliberations of these conferences' sheds light on key concerns that are objective markers for the formulation of regulations.

4.5.1 Sendai Framework for Disaster Risk Reduction 2015 - 2030

The Sendai Framework was adopted in March 2015 at the Third United Nations World Conference, in Sendai, Japan, as a fifteen-year framework to guide nations in the broad task of avoiding disaster in communities. It builds on the earlier Yokohama Strategy for a safer world, and the Hyogo Framework of 2005. The framework provides a basis through which an international benchmark can be gleaned. This in turn represents the consensus position among nations on what the objectives of regulation are.

The Sendai Framework represents a global consensus on how to reduce risk. Such a broad consensus offers a useful benchmark as a the point of exploring the existential anchor for the rules that are shaped as the result of this guidance. An examination of the adopted guiding principles shows the key themes that dominate the thinking.

The Framework sets out four priority areas upon which it develops guidance for nations to build on. These are:

1. Understanding disaster risk
2. Strengthening disaster risk governance to manage disaster risk
3. Investing in disaster risk reduction for resilience
4. Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction.

4.5.1.1 The Priorities of the Sendai Framework

The significance we draw from the prioritisation of the Sendai Framework, relates to the critical action that have been isolated or flagged out. Governance is seen to be a key priority and is arguably the critical step in Disaster Risk Reduction.

Beyond the enhanced governance structure, the framework emphasises the need for understanding the risks involved.

Upon this benchmark, are built the governance structures that include the building regulations.

The philosophy that guides the Framework is gleaned from the concerns expressed, “the well-being and safety of persons, communities and countries as a whole” .The heavy toll that disasters can inflict is spread across loss of life, injury to persons and disruption of life for individuals and families. At the community level, economic loss is cited as a key negative outcome and all this is seen to impede progress toward sustainable development.

4.5.1.2 Critical recommendations from the Sendai Framework

The Sendai framework addresses itself broadly to the need to keep cities and communities working in the light of risks faced from the various disaster that could occur. In the priority areas mentioned, the documents focuses heavily on involvement of all the players and empowering them through information and scenario building.

Under the rubric of understanding disaster risk, the framework emphasises the collection and analysis of relevant data (e.g. at Sec 24 [a]) the sharing of such information within the community e.g. at (24 [g]). The framework also seeks to dig into the commonly held knowledge and advocates for the use of traditional knowledge (24[i]) to complement scientific knowledge.

The involvement of local people is passionately promoted in the document. Their education through formal and non-formal methods (e.g 24[l], [m] and[o]) and the involvement of community groups.

When it comes to the question of strengthening disaster risk governance, the framework places great emphasis on promotion and provision of incentives for members of the community (e.g at Sec 27 [a]). It advocates for the creation of mechanisms and incentives to ensure compliance with relevant provisions in the existing laws, including building codes.

The framework further addresses the need for disaster risk reduction for resilience. Under this rubric, specific action by the authorities are recommended especially in the allocation of resources and the development of appropriate policies. There is a clear encouragement for the revision of codes and standards and specifically for “informal and marginal human settlements” (e.g sec 30[h]). Community involvement is further emphasised and advocated in this section.

When the document address ways of enhancing disaster preparedness the emphasis is on the empowerment of the community through the creation of structures that serve that goal. Among these are the creation of people-centred forecasting systems tailored to the culture of the community. (33[b]). The establishment of community centres for the promotion of awareness is also mentioned (33[d]).

4.5.1.3 A Summary of the Framework.

The critical thought that is the unmistakeable spine of the Sendai framework is the thorough involvement of the community. The framework envisages an integration of the thinking relating to disaster reduction deeply in the life of the community.

This is significant. The message we distill from this is that resilience resides in the consciousness of the people themselves. Actions and policies that governments and authorities may take are geared towards creating a mindset within the population that is sensitive to the risks we face and prepared to act in mitigation in the daily decision making.

This viewpoint enhances the observation made from historical survey.

4.5.2 Hyogo Framework

The Hyogo framework preceded the Sendai conference by a decade and inevitably, most of the issues that were discussed there were further developed in the later conference. The value of

looking at this conference, alongside Sendai, is to see the level of consistency and to track shifts in emphasis.

In my assessment, the most critical part in the outcomes of the Hyogo conference was the identification of priorities for action. Five priorities for action were identified namely:

Ensure that disaster reduction is a national and local priority with strong institutional basis for implementation.

- Identify assess and monitor disaster risks and enhance early warning.
- Use knowledge, innovation and education to build a culture of safety and resilience at all levels.
- Reduce the underlying risk factors.
- Strengthen disaster preparedness for effective response at all levels.

Each of these would in its own way be an important contributor to society's level of preparedness. However, a special note needs to be made for the priority (iii) which directly relating to the involvement of the community and which has been carried through in the subsequent conference.

4.5.3 Yokohama Strategy

The highlight of the Yokohama World Conference on Natural Disaster Reduction, of May 1994, was the creation of what was labelled as the Ten Principles for a Safer World.

It is clear that the envisaged strategy for the prevention of disasters continued being fine-tuned in the conferences that follow. Where a lot of the actions envisaged focus on the actions and policies of the governments - which would not concern us too much in this study - it is noteworthy the early identification of community education as a critical part of this.

The Yokohama strategy sought to "incorporate disaster reduction prevention or mitigation in socio-economic development planning …." and to give "due consideration to the role of local authorities in the enforcement of safety standards….".

This recommendation lays the basis for the future focus on regulation as a critical part of disaster mitigation but significantly recognises the need to take the population as partners in the endeavour as opposed to mere recipients of authoritative edicts.

4.5.4 Summary of Lessons from the Three World Conferences.

The significance we draw from the prioritisation of the Sendai Framework, relates to the critical action that have been isolated or flagged out. Governance is seen to be a key priority and is as the critical step in disaster risk reduction.

Beyond the enhanced governance structure, there is need to appreciate the risks involved.

Upon this benchmark, are built the governance structures that include the building regulations.

The philosophy that guides the Framework is gleaned from the concerns expressed, “the well-being and safety of persons, communities and countries as a whole”. The heavy toll that disasters can inflict is spread across loss of life, injury to persons and disruption of life for individuals and families. At the community level, economic loss is cited as a key negative outcome and all this is seen to impede progress toward sustainable development.

4.6 The Australia Reform Process

The report of the Productivity Commission of Australia into the Reform of the Building Regulations is a useful resource to offer a snapshot on the consideration and the process of crafting building regulations. A hermeneutic analysis of this document affords an opportunity to look at the process to discern the underlying principles embedded in the final statements of regulation.

Australia is a valid reference point for various reasons: The most critical of these is the availability through their very thorough documentation, of a tangible record of the thought process. Australia is a commonwealth country that share a historical connection, along with Kenya, to the developments in the United Kingdom.

The process of interrogating the building regulations in the Australian Federation was entrusted to the Australia Productivity Commission.

In the preamble of the document the aim of the study was stated. “The Productivity Commission was requested to undertake a research study examining the contribution that national building regulatory reform under the auspices of the Australian Building Codes Board (ABCB) has made to the productivity of the building and construction industry and its impact on economic efficiency in Australia as well as the potential that such reform has to make further gains.”

A key question that is raised in this work was why government should intervene to create building regulations. The insight provided by the commission goes beyond the functional aspects of ensuring safety and health. The protection of the users of buildings, who would otherwise not know what protections have been built into a building, is, reasonably, the first justification. Further justification is provided through consideration of other non-life-threatening dimensions but which affect the quality of life like sound and weather proofing of buildings.

What is of interest to this study is the justification provided beyond this point. Government intervention is seen as necessary to steer people to provide either benefits that society can gain from (positive externalities) or to minimise the spillover costs (negative externalities).

An encouragement of spillover benefits raises the probability that society generally benefits from the process. An example here is the benefits to be gained from research. According to the commission:

From a public policy perspective, the challenge is to provide incentives for the creation of building research, while allowing as many practitioners as possible to access it.

These considerations explicitly encourage builders to a directions of positivity and broader benefits. Critically they encourage and almost guarantee adherence to the regulations. A further significant justification is the guaranteeing of minimum standards.

4.7 Findings from the contemporary documents

The international conventions discussed in this section illuminate the contemporary thinking about urban risks, and establish the broad direction for the governance of urban development. The most obvious dimension is the expanded concerns of the regulations and the appreciation of the political aspects of the process.

We see that the process of regulations has evolved to incorporate education of the population as a goal; a necessary prelude to the deeper involvement of the population itself as a player in the broad aspect of risk reduction. This expansion of the focus of regulations can be discerned to be the outcome of a focus on the urban environment. It is a significant recognition of the changed nature of the risk profile in the urban settlement where premium must be placed on shared resources, including space, to underpin overall quality.

Further, there is the recognition of time dimension and the direction connection made with the resilience of the city. Governance is thus cast into a more sophisticated frame with the overall health of the living environment in all its complexity as the new focus. This is a major leap forward in the thinking on governance and regulation and envisaged a deeper more nuanced thought process in the formulation of the regulations.

4.8 Conclusion from the Analysis of Key Documents

The preceding analysis illuminates the initial impetus behind the development of building regulations, which stemmed from the pressing need for community survival. These regulations were intended to provide guidance to society in preserving life and the conditions that support it. Notably, they established a hierarchy of responsibility and assigned a role to the government as the guarantor of the public interest.

These developments propelled society forward in grappling with the unforeseen consequences of urban growth. The management of life-threatening conditions became a collective concern, and the government assumed a role in resolving these issues. This fundamental understanding now had to coexist with the innate human desire to shape their basic shelter.

Fundamentally, building regulations encapsulate the historical circumstances that necessitated regulation and incorporate aspects of societal organization that can be justified as contributing to the welfare of society as a whole. The welfare of society, in its collective sense, lies at the core of this regulatory process.

Ideally, when such a framework is established, it should be internalised by each individual so that the choices citizens make on a personal level align with the broader societal good. Recent scholarship has explored these issues through the lens of the commons, emphasising the shared aspects of our lives and highlighting the role of Common Pool Resources (CPR) in underpinning societal interests.

The concept of the "tragedy of the commons" looms large in this context. Initially described as an economic theory, it posits that individuals tend to exploit shared resources, resulting in an imbalance where demand greatly surpasses supply, ultimately leading to the unavailability of the resource for the collective. It has been observed that "unless the number of individuals is quite small, or unless there is coercion or some other special device to make individuals act in their common interest, rational self-interested individuals will not act to achieve their common or group interest." This insight emphasizes the need for regulations to secure the existential interests of society and prevent lasting damage that can be inflicted even by individuals acting rationally.

A global perspective on these issues reveals their universal nature. Risks to living environments, across different cultures and regions, share common threads. Balancing concerns for the societal good and individual autonomy in shaping the built environment necessitates the examination of

higher principles to find a convergence point. Society largely survives by integrating critical values into the behavior of its members.

This historical lesson underscores the pervasive concern for the public good throughout the development of regulations. Equally important, however, is the recognition that individual attitudes cannot be compelled but must be persuasively engaged. This recognition is embedded in international conventions and their recommendations for governments worldwide, such as the Sendai and Hyogo frameworks.

The historical trajectory reveals that building regulations seek to guide society towards shaping the built environment in alignment with a higher principle. I propose labeling this principle as urban morality, which enables members of society to share a vision of what is considered good and bad. In getting there, not only should the population be involved, but such involvement needs to be meaningful and geared towards raising the collective consciousness of the polis.

The analysis in this chapter builds a clear picture of what outlook drives the formulation of building regulations. This is a critical stage in the research process and advances the ultimate goal of discerning the embedded meaning.

In the examination of the theory of regulation, the significant finding is that a socially efficient use of resources is a key goal. However, quite apart from being a goal, it is a necessary arrangement which bring order to society. Regulation is the only way to deal with issues such as pollution, externalities that supersede the scope of individual interest.

The abiding thread through the justifications point to two unavoidable conclusions: The first of these is that the pursuit for justice and the prevention of a “moral hazard” - where some members of society, holding more information than everyone else, may take advantage of that fact - is a key goal. It provides fairness and equity in the conduct of public affairs related to the creation of the

built environment. An authority with an overarching view is required to institute a just order. This order requires imposition of a standard - even if it is loosely defined - and a process of approvals. Basically, these are the protocols of establishing and projecting authority over the situation, and thus serving the stated goal of protecting the common interest. It is this thinking therefore that underlies the institution of a code, the objective being to lay down a structured process through which the pursuit of the desired goals can happen.

A second finding relates to the management of the converging interests of the various aspects of society. The inability of the single individual or a single entity, to intervene in matters that are broadly shared, creates the need to formulate the nature of this convergence of interests- what becomes known as the common interest. The protection of this common interest becomes a critical justification of regulation. However, we also note that the theory of regulation does not provide for a foolproof method of sealing any gaps of interpretation of what constitutes “common interest”, a concept that is inherently rooted in societal dynamics.

This, the transitional property of common interest, is brought out vividly by the examination of historical developments. The findings in the reading of historical documents point to the acceptance that the well-being of all members of society was linked and that a way must be found to achieve it. Left to its own devices, society is highly vulnerable to a slide into the abyss. The very dire situation at the time of the institution of the Public Health Act is a lucid demonstration of this fact. In later days, this concern for the inability of society to organically prevent a negative outcome continues to be a valid justification to act through an authority as seen through the reading of the international conventions and by an examination of the cited process in Australia.

Taken together, it is thus possible to state categorically that a concern for the health and safety of the population is at the core of regulation. However, it must also be added that there is no alternative to this approach since society is handicapped by its inability to count on the good

intentions of individual members - the ideal situation - without the propping of stated and enforced rules.

The present-day position is represented by the international conventions on Risk Reduction. The common thread running through the recommendations creates a direct connection with the philosophy at the genesis of regulation.

The examination of the historical development has revealed aspects of the essential nature of the regulations. The building regulations were borne of an existential threat. The goal of reducing the mortality rate especially by improving the sanitary conditions left little room for error. The regulations were fashioned to succeed in the reduction of this threat without the option of failure.

The proponents of the initial set of regulations also framed their effort in in the promise of political security, prosperity, order and peace. The regulations were seen to contribute, significantly, to good order in society. The concern with good order in society raises the moral value of building regulations and elevates their application to a critical obligation.

Related to this concern, we find that the question of how responsibility was to be apportioned was resolved in favour of an overarching authority.

This resolves the question relating to the underlying philosophy of the building regulations. The further examination of the regulations are they are stated today, is thus informed by the understanding that the regulations are an important tool for the preservation of critical aspects of human civilisation. The process of constructing shelter, in all the various ways this process manifests, must be geared to the protection of an effective living environment. The challenges of the urban environment as discussed earlier in Chapter 2, require that the regulations be disaggregated into their constituent aspects and focussed to this goal.

In the following chapter, this is applied to the Kenyan regulations and conclusions drawn.

Chapter 5 **The Evaluation of the Kenya Building Regulations**

5.1 Introduction

In this chapter, the intention is to advance objective 2 of this research as stated in the opening chapter. The goal is to interrogate the building regulations that exist for Kenya, in order to determine how they relate to urban resilience.

To develop a solid context for the critical results of the analysis of the regulations, it is necessary to draw a broader picture and to give a sampling of the manner in which the guidance is communicated. This summary will give an abridged but critical presentation of the flavour and tone of the guidance.

In this first part of the chapter, I discuss the impressions of the building regulations stated for Kenya under a few headings. These regulations are contained in the incumbent Building Code, which is the set of regulations that is formally in place, and in the Draft National Building Regulations(see Table 3.3). The rationale for these examining these documents has been explained in Chapter 3.

The criterion of evaluation is contained in the conceptual framework presented under the methodology chapter (see Chapter 3). A summary of the impressions gained is offered, supported in some cases by indicative numbers. However, it is the qualitative aspect that remains a concern of the research and the numbers do not lead to any conclusions except as nominal indicators of emphasis.

I have used examples liberally here for clarity and easier communication of the nature of the regulations.

The impressions formed and reported here are results of the coding process which involved an examination of each and every clause of the stated building regulations.

5.2 Observations on the Presentation of the Regulations

5.2.1 The Structure of the Regulations: Both the Building Code 1968 and the draft National Building Regulations in their various iterations, are structured in a similar way. The National Building regulations (NBR) are more elaborate and it is reasonable to assume they reflect current thinking. The regulations are organised in book form, but stated through distinct clauses. Each clause contains a statement of guidance on a particular action in the building process and offers a how this is to be achieved.

The basic structure of the regulations focusses on building elements with each of the main elements presented as a chapter. In reference to the draft National Building Regulations, we have a chapter on floors, on walls, roof etc. There are also chapters dealing with key services like water supply into buildings and electrical power provision.

Two examples of clauses, from the NBR, help demonstrate the scope of the concerns of the regulations. In offering guidance on the space for work, this clause is included:

> BB94.1 Every room used for habitation or for purposes of an office or as a kitchen shall be provided with natural lighting and ventilation.
>
> At a broader scale, the regulations address the site management in fairly broad terms. Section B of the regulations contain the clause below:
>
> BB1.3 A person owning a plot upon which a building may be so sited as to form a terminal feature to a street or which may otherwise be prominently displayed shall site such building in such position as the Approving Authority may decide and that person shall comply with such

stipulations as may be imposed with regard to siting, size, height, shape and appearance of such building.

The significance of this observation is in the insight it offers on the focus of the regulations. We can discern from this the emphasis placed on the actual building and the clear de-emphasis on the other circumstances of the environment, that is, the context of the building. Where the regulations demonstrate a concern for the broader aspects of the context as in the example above, this is still anchored in the actions on an element of the building.

This limitation of scope can be seen as an opportunity missed. An alternative approach seeking to connect in the mind of the builder the importance of the context would be a stronger thrust in getting builders to develop an appreciation of the interconnected nature of the urban fabric. The omission raises the probability of benign neglect of the shared domain.

5.2.2 The Distribution of Responsibility: Great emphasis is placed throughout the regulations on the role to be played by various actors in the building process. Of these, action revolves mainly around "the approving authority" and the regulation make this entity the central player.

The approving authority is defined within the regulations as the Planning and Building authority, an entity created by a separate law for the purposes of administering the building process.

Figure 5.1 represents a word tree generated for the words "approving authority" and interrogating the entirety of the regulations.

A role is indicated for experts in certain processes. The builder is completed to employ specified expertise, usually engineers in specific actions. An example of this kind of stricture is provided here:

DD15.1

The operations specified in sub-regulation DD14.2 shall be carried out only:

(a) under the immediate supervision of a registered structural Engineer or a similarly competent person with adequate experience of the particular kind of works; or

by workmen experienced in the kind of work and under the direction of a registered structural Engineer or a similarly competent person.

A similar example envisaging a two-step approval of the expertise to be employed is provided under this clause:

OO7.1

Any drain, discharge pipe or ventilating pipe shall be so installed as to be capable of withstanding the test pressures contemplated in regulations O032 or OO33, as the case may be and such tests shall be carried out in the presence of the building control officer of, or other officer duly authorized by The Approving Authority.

It is within these provisions for different player to be involved in the process, that the position is made clear about the limits of freedom the builder has. As pointed out earlier the regulations have an overall task of circumscribing the freedom that accrue to the building process as manifested here.

5.2.3 Threshold of Criminality: The building regulations create a threshold for criminality by defining certain actions as leading to culpability. This is a significant aspect of the regulations and sheds light on the nature of the recognised limits. Criminal actions with the penalty indicated appears in about 20 clauses.

The clauses differ in emphasis from merely compelling a builder to a certain line of action -, without indicating the penalty for breech, to strong statements of heavy penalties available for a

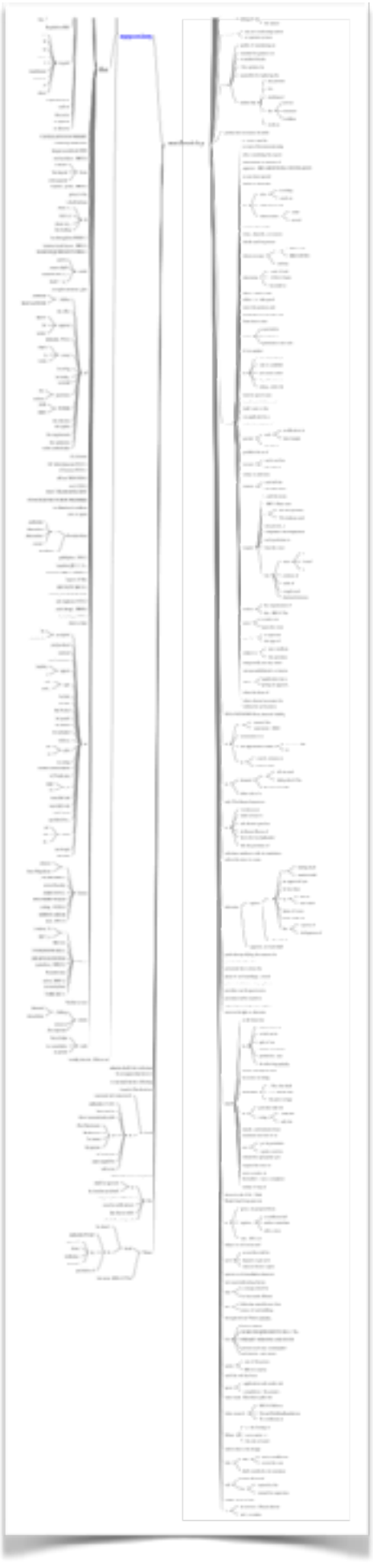

Fig 5.1
A word tree indicating the prevalence of the phrase "Approving authority"

transgressing action. Two examples are offered below:

DD 10.1

Before the demolition is commenced, the registered contractor in respect of demolition works shall:

(a) ensure that no persons are left within the building or the environs around the building;

(b) cause to be disconnected and remove meters for the supply of gas, electricity, water and other services, save in so far as the same may be used in the demolition works, cause the supply of gas and electricity to the building to be disconnected; and

(c) cause any fitting attached to the building in connection with any system of street lighting, supply of electricity or other service to be removed.

DD10.2 Before commencing the demolition, the registered contractor appointed in respect of the demolition works shall:

where a wall of the building abuts or fronts upon a street, service lane or other open area accessible to the public:

erect along that wall, at the level of the first floor of the building above the level of the street, fans or catch platforms;

(ii) erect fans or catch platforms at the level of such other floors of the building as may be necessary to prevent any nuisance from dust or danger from debris or materials so that such fans or catch platforms are sited at vertical intervals of not more than 10 m with the uppermost fan or catch platform not more than 10m below the working level; and

(iii) erect dust screens to cover the whole of the wall so as to prevent any nuisance from dust;

(b) seal all sewer and drainage connections; and

(c) remove all glazed sashes and doors from the building.

DD19.2 A contractor who contravenes sub-regulation DD10.2 shall be guilty of an offence and shall be liable to a fine not less than Kshs. 50,000.00 (Kenya Shillings fifty thousand only).

DD19.3 A registered contractor who contravenes sub-regulations DD11.1; Regulation DD12; sub-regulation DD13 (a); Regulation DD14; sub-regulation DD15.1, DD15.2 & DD15.3; Regulation DD16, sub-regulation DD16.3; Regulation DD17 DD18 or DD19 shall be guilty of an offence and shall be liable to a fine not less than KShs. 200,000.00 (Kenya Shillings two hundred thousand only) and to imprisonment for a period not less six months or both.

5.2.4 Statement of Standards. A critical primary outcome of the building regulations is the statement of standards that permeate the regulations. The standards are stated in the form of performance standards which serve as a benchmark for indicated action, and specified standards. The regulations also critically include instances where minimum standards are stated.

The guidance offered through a performance standard would, on the face of it, allow for different approaches to manifest in the way in which the solution is formulated. A specification however is specific and requires to be implemented as stated.

Examples of these two approaches are provided by the following clauses:

NN8 NATURAL LIGHTING

8.1 Where for the purposes of natural lighting a room is provided with one or more openings, such opening or openings shall be situated in an external wall, or in a suitable position in the roof of the building.

8.2 Where such opening is glazed it shall be glazed with transparent or approved translucent glazing material.

8.3 The area of such opening, or total area of such openings, inclusive of frames and glazing bars, shall be not less than 10% of the floor area of the room or rooms served by it, or 0.2m^2, whichever is the greater.

A similar approach has been taken in this example on the construction of foundations:

FF3 STRUCTURAL MATERIALS

The material used in the construction of any structural element or component thereof shall be that specified or contemplated in:-

(a) the relevant BS Code of Practice where such code has been used as a basis for the design;

(b) any document, other than a BS Code of Practice contemplated in regulation FF2, which has been used as a basis for the design:

Provided that where the materials specified in such document are not available, other materials of equal or better performance may be used if they have been shown to be suitable in relation to such document.

Where any structural material other than one covered by any code of practice contemplated in regulation FF2 is used in any building, the design of such building and the structural elements and components thereof shall be in accordance with a safe method applicable to the structural use of such other material.

In contrast, the following clauses a quite specific in the guidance.

O03 CONTROL OF OBJECTIONABLE DISCHARGE

OO3.1 No person shall cause or permit sewage discharged from any sanitary fixture to enter:-

(a) any storm-water drain, storm-water sewer or excavated or constructed watercourse;

(b) any river, stream or natural watercourse whether ordinarily dry or otherwise; or

(c) any street or other site.

Examples of minimum standards set out in the regulations are seen in the following clauses

BB4.1 Unless otherwise agreed by the Approving Authority, no building shall be so sited as to have a principal frontage abutting on to a street of a less width than 10m.

BB18.2 Where:

a) an access road provides or will provide access to not more than 12 separate buildings or not more than 24 flats, whether such flats are in the same building or not; and

b) the aggregate of the areas of the floors in all the buildings or flats does not exceed 3500m^2; and

c) spaces, to enable vehicles to pass, are provided at distances along the access road not exceeding 60m in length, the width of the carriageway of the access road may be not less than 5.0m and the width of the footpath not less than 2.0m.

5.2.5 Scope of Powers. The regulations spell out the scope of the powers represented therein. This is especially in the clear statement of the type of buildings that are covered by mandatory regulation. The gist of this is that the regulations cover almost all buildings that would be proposed in an urban setting. They offer guidance in all site operations, aspects of design and the provision of infrastructural services, and also on-site management.

The regulations also cover alteration to buildings and the extension of already approved buildings.

In this manner, the regulations are comprehensive and leave no room for actions to happen outside this scope.

5.2.6 Maintenance of a Public Record. An important outcome envisaged by the regulations is the creation and maintenance of a public record of all construction. Builders are required to share information on the nature of constructions erected. The authorities may require such information to be submitted as seen in the following clauses.

> DD14.3 A notice in the specified form specifying the name of the person or persons appointed in accordance with sub-regulation DD15.1 shall be posted up in a conspicuous place on the site of the demolition works.
>
> UU 11
>
> 6. The designer shall take all reasonable steps to provide with his design sufficient information about aspects of the design of the structure or its construction or maintenance as will adequately assist—
>
> clients;
>
> - other designers; and
> - contractors, to comply with their duties under these Regulations.

5.2.7 Summary

The foregoing provides a context to the analysis and gives a snapshot of the way in which the clauses and guidance of the regulation are formulation, and the language used to communicate. The developed framework of analysis was not applied to this sampling, but is the basis for the rest of this chapter

5.3 Results of Content Analysis

This section of the chapter presents the results of the evaluation of the Kenya building regulations based on the framework outlined earlier. The research design turns on the interpretative paradigm

and consistency is maintained in that respect. The results are the outcome of an interpretive process with the stated goals to bring out the meanings embedded in the analysed material.

The research applied the methodology outlined above to the Kenya building regulations. Every clause was examined and coded as per the stated process. The process was aided by applying the software NVivo, a qualitative analysis application.

In assessing the results of this exercise, the most important factor is seen to be the language used to express the regulation. The value judgement to be made is contained in the language of the regulation in the words that are used, the emphasis and the orientation. It is here that the judgement is made and reduced to codes.

The codes used therefore are a key part of the findings. The codes are not predetermined and are allowed to emerge rationally from the regulations as stated. This then becomes the first significant assessment of the regulations. The list of codes that emerge from this offer an insight into the concerns of the regulations and the emphasis that has been placed in themThe second level of concern is the language that is used which helps reduce the codes into various categories. This sheds light on the concerns of the regulations and clarifies the list of codes. The list of categories serves as a sharper filter to clarify the scope of the concerns and begins to give an insight into the demeanour or attitude that the regulations represent.

The close examination of the language of the regulations and an assessment of the attitudes in the tone of this regulations provides us with the basis of synthesising the themes that they carry and from here to be able to move towards a theory of what the regulations represent. This is a significant aspect of the qualitative research approach that this study has adopted and justifies the deep examination of the clauses of the regulations as opposed to the selection of a sample. If the theory is to be generated then every one of the clauses could potentially offer a significant insight into the aims and objectives of these regulations.

Here below then I present the most significant findings from this explanation of the rules. I have also indicated why I consider that these findings are significant as a basis for later drawing for the conclusions from them.

5.3.1 The Scope of Concerns in the Regulations

(i) Foundation

In this work we have developed a trajectory of argument that seeks to relate the building of individual element in the urban fabric to the overall quality and health of the resultant environment. The historical lesson is that the disasters that afflict urban environments have their roots in the actions taken at a much smaller scale.

We have already noted that the effort that produced the first versions of the Public Health laws had a great concern in protecting the health of the population but this effort was building on a basic structure that existed in response to earlier calamities.

The concern today on the extent of the scope that has been brought to the umbrella of the regulations and to see what is now considered a necessary target for regulation. This should then shed some light as to the potency of the regulations in relation to the broad city.

(ii) The Finding

The first area of interrogation of the building regulations is the range of their concerns to determine what is actually covered or what is being regulated.

in the examination of the regulations, we find that they place primary responsibility of the outcome of the building process, to those that seek to build. This responsibility requires a developer or a builder to adhere to indicated standards of performance or to a set of specifications.

The stance of the building regulations create a scope trajectory that emanates from the actions surrounding the needs of an individual developer or builder. The builder is thus the driver and generator of the domain that will be regulated.

The regulations create formal space for expertise, which is intermittently specified, to be employed in the construction of buildings. In the main this ensures that the science of structural engineering is applied properly in the construction of buildings.

The regulations do not, in a focussed way, address the space outside of the buildings, i.e the shared space, except as maybe affected by the actions of individual builders. What we find in the regulations is an omission of a concern with the broader environment which may include the infrastructure in place to support the functioning of buildings.

The significance of this findings is seen against the primordial need and desire to built; i.e to provide for shelter. This is a right inherent in our human nature and cannot be disinherited. In order for society to have the greatest benefit from the construction of the built environment, a structure that limits the boundaries of action is necessary and the building regulations provide this delineation. No man is entirely free to build as they wish.

5.3.2 The Comportment of The Regulations

(i) Foundation

Social involvement is recognised as a critical aspect in the acceptance and eventual adherence to the regulations. The international conventions cited place emphasis on “decision making responsibilities” of the local communities.

Following on this, it would be expected that regulations are formulated with a friendly demeanour that recognises the key players as the very members of society that benefit from the outcomes of the regulatory process. As noted earlier in this study, the building regulations would have to be a part of life pattern of the community to achieve acceptance. The historical perspective suggests that populations have to be convinced on the rightness of the direction in order to engage and adhere.

(ii)The Finding

The tone of the regulations recognises that the actions to create buildings and the environment for living, are in the hands of the citizens. The *overall* responsibility of the regulations tends towards a guidance of this process. Within this basic thrust, the regulations permit a spectrum of actions and educate on a wide range of issues, by indicating what is the desired outcome or what will work to produce that outcome.

The regulations however project a range of attitudes; from the highly permissive, to the strictly prohibitive. Within the language of the regulations, we are able to recognise educational and informative stances. there is guidance on various issues in the process of building. But there is also the projection of authority and the creation of a threshold of criminality. Restrictions are indicated where critical aspects of the building process are the focus.

The building regulations facilitate the creation of an environment that mirrors the culture and building tradition of the locality. So, we note that the regulations do not seek to dictate an aesthetic in terms of the building form, colours, etc. There is a restraint focusing on issues that affect health and safety of the people.

The regulations use a mainly permissive language which acknowledges that citizens may seek to build a wide spectrum of facilities and structures. In this way, the regulations allow room for creativity and do not preempt the solutions that may be offered. The regulations also seek to be informative and educative. They communicate the best practices to aspects of building from other jurisdictions.

Protection of common interests guide a number of clauses in the regulations and in these instances, the regulations are authoritative and final. An attitude of guidance is adopted widely within the language of the regulations.

The significance of this findings is in the inherent recognition of the part of the citizen in the development of the built environment. The regulations maintain a dignified posture towards the

builder and do not seek to be overbearing and in this way deliver a subtle nudge towards responsibility. That posture is critical in the totality of the population's actions.

5.3.3 The Thrust of The Advocacy in The Regulations

(i) Foundation

In the exploration of the philosophy underlying the building regulations the thrust towards sustenance of the life protecting aspects of a community is clear. But this matter is itself the subject of expansion and restatement.

The rise of the environmental movement brought a new level of sensibility to the built environment. What we build and how we build matters in the in the overall effort to conserve quality in the environment.

The shape of the logical outcomes of the building regulations, is further complicated by the concerns for the vagaries that ensure in the shared spaces of a settlement, including the impact on public health and the safety of persons. For the researcher, there is a concern for the manner the regulations would address the necessary response within the population.

(ii) The Finding

The Regulations do not take the stance of a disinterested observer but rather have an advocacy mission built into the structure and language. The analysis of the clauses reveals that :

- The regulations have an underlying principle guiding them evidenced by the language and the manner of addressing the issues at hand.
- The most significant of this aspect is the setting of standards, which are communicated through either performance standards - thus allowing for different paths to the desired outcome - or specific minimum standards set for the task.

- Through the employment of deemed-to-satisfy provisions, the regulations serve as a source of guidance to building practices. This serves as a point of reference for good building practices, and a useful educational mechanism.
- The regulations inherently protect society and human values. This is especially seen in the guidance for provision of space including the dimensioning. Inherently, most of these provisions address the question of human dignity and ensure that users are not required to conducted themselves in an unnatural way. (A good example of this is the guidance offered in the design of the staircase which ensures that people can scale a height with only minimum deviation from a normal walk).
- Little guidance is offered for shared concerns and no standards are expressed either way for the common spaces and facilities. Where mentioned, they are peripheral.
- The regulations are strictly in favour of a structure of authority and are loath to create much space for community action, or community interpretation of priority and value.
- The underlying philosophy in this advocacy thrust seek to nudge a community towards a rational approach to a building task, without being overbearing about it. The approach however is value-laden and informed by practices that are commonly held. For Kenya, this serves to introduce the population to practices in the rest of the world, laying a foundation for re-orienting urban life.

5.3.4 The Envisaged Outcomes of The Regulations

(i) Foundation

The existence of buildings in our visible universe, meaning the environment we experience in the normal life of human beings, is not an idle or inane reality. Buildings ultimately shape society and give form and stability to human functions. What we build solidifies society against time. (Gieryn, 2002).

Regulations have evolved to respond to crisis within communities. Such crisis destabilise society and social life. The essential concern therefore points to this need to maintain stability and restore the sense of security that the building fabric offers.

(ii) The Finding

The overwhelming concern of the building regulations focus on the mitigation of dangers to life, to property and to the livelihoods. To a less extent, but significantly so, the regulations focus on the preservation of human dignity in the shaping and use of created space.

To a much lower degree, the regulations address the shared space and quality of life in the public domain. As expressed in the earlier finding, this concern is fashioned in the projection of the individuals concerns and falls short of offering a guidance on how common or public domain ought to be shaped. Such a concern, were it to be incorporated, would contribute immensely to stabilising the quality of the shared urban environment.

It is not possible to discern why this omission exists. Conceivably, the formulation of the regulations did not set the higher goal of shaping the emergent built environment in all its dimensions and probably hoped that other statutes and laws will fill the gap.

Further, the regulations address the prevention of disaster and the disruption of life. In a similar way, this is projected from the perspective of individuals actions and does not offer a datum for the guidance of city scale or societal level.

The lack of a focus position on the societal level is a major omission of the regulations and renders them incomplete but not ineffective.

The ultimate goal of the regulations are focused on the fate of citizens as individual human beings. In this finding we identify a gap in the conceptual linkage and assurance of a functional urban environment, evidenced in the lack of a clear position on the societal factor, the accommodation of

communal action and the recognition of the broader environment - including pollution and erosion of the physical resources.

5.3.5 The Level of Authority in the Regulations

(i) Foundation

In a previous section we have cited the offering that regulation "mean employment of legal instruments for the implementation of social economic policy objectives." (Hertog 1999). A characteristic of legal instruments is that individuals or organizations can be compelled by government to comply with pressured behavior under penalty of sanctions.

(ii) The Finding

The building regulations are not self-executing and have the public authorities as the critical enforcers. This provides a structure to the decision making and a point of reference for the legitimacy of the regulations.

The structure envisaged in the regulations revolves around an "Approving Authority". However, other sources of authority are recognised including the courts who may prescribed fines and experts who must be consulted on certain actions.

Whereas the regulations are carefully worded to avoid an authoritarian tone, they employ the force of law in instances and constrain the scope of independent action.

In a significant number of clauses, the regulations define a threshold for criminality and indicate a penalty for infringements.

Significantly, the regulations defer to expertise, indicating in several clauses the nature of expertise (like engineers) who must be consulted on a certain action.

The regulations do however contribute in a significant way to the formulation of a structure of authority and mitigating how the sharing especially of infrastructure should happen.

The regulations are devised to, where necessary, compel actors in the building process, to comply with a set direction. They have the force of law and can, in the breach, attract severe punishment. This is clearly meant as a deterrent to rouge behaviour and to set boundaries on adventurous or outlandish conduct.

5.3.6 The Educative Values of the Regulations

(i) Foundation

Resilience building requires that communities strengthen and improve their approaches to among other things knowledge creation. Being aware is an essential aspect of resilience building. (Rodin, 2015)

The building regulations are a communication with the population and offer an opportunity to deliver insights and learning. International conventions as we have seen, highlight the need to develop an educative value of the regulations. In the review of regulations in Australia, the aspect of the regulations was highlighted as a desirable outcome.(Productivity Commission, 2004) The quality of the commonly held knowledge is a critical part of the capacity of society to respond to challenges.

(ii) The Finding

The examination of the regulations reveals that they offer an educative stance in the indications of best practice. In this manner, the regulations become a useful reference point on the best way to achieve practical results.

The regulations offer guidance on the use of materials indicating for potential and actual builders what the best options are in material selection.

One of the most useful gestures in the statement of the regulations is the constant offer of optional methods of satisfying the formal requirements, by including the “deemed to satisfy” provisions that allow a builder to have a clear idea of an acceptable solution to an aspect of the construction

process. This avoids the trapping of builders in cul-de-sacs and offers a way out. This is an reassuring gesture.

The regulations do not educate on the continuum that constitutes the built environment. The educative insertions in the regulations are devoid of the necessary context to give them full meaning.

The significance of this finding is in the strategy it represents to improve the quality of commonly held knowledge that guides members of society in making acceptable choices and maintaining their acceptability within the community.

5.3.7 The Incentivising Value of the Regulations

(i) Foundation

The nudge theory of behavorial economics, proposes positive reinforcement and indirect suggestions as ways to influence the behavior and decision-making of groups or individuals. (Thaler and Sunstein, 2008). The international conventions on risk reduction also emphasis the value of raising the level of responsibility within communities

The growing realisation of the important of community behaviour and shared sense of value is highlighted by the growing body of literature on the matter. (Ostrom,1990; Standing, 2019). The matter also runs through the resolutions from the international conventions on risk reduction.

(ii) The Finding

The Regulations have not actively used the power of incentives to pursue specific outcomes. A trade-off between different options may potentially encourage the choices not taken in favour of common good. The possibility of trade-offs in the process of construction, especially when applying the deemed to satisfy principles are not explored firmly or to any significant extent.

Incentives have been used largely by implication rather than by express provision.

This fundamentally represents a missed opportunity. Within the scope of activities that a single player may enter into are opportunities to enhance the public good and which contribute to the overall resilience of the community. Such opportunities would include enhancement of public space, creation of more green areas, enhancement of walkability and the prevention of pollution in the environment.

5.3.8 Incorporation of the Commons in the Regulations

(i) The Foundation

The common interest theory of regulation should lead us to expect that the regulations will show a committed concern for the shared resource, notably the space and installations that serve the entire community. The regulation of the interface between the shared public domain and the private is a function of good governance and civic structures. (McLaren & Agyeman, 2015).

This study tests this aspect as an important response to the findings of the first objective and the literature review, where we arrived at a conclusion that the health of the urban settlement as a life sustaining entity is domiciled in the main in the common space. The attitude exhibited to this matter in the regulations would be critical in determining the potency of the regulations in protecting the resilience of the settlement.

(ii) The Finding

The regulations to shared resources and seek to secure proper utilisation. The highlighted elements are public space, Shared infrastructure (roads, water, drainage, etc) and the shared natural environment. The regulations are short on emphasis on these issues with only a few clauses bringing this up.

What we do not see in the stated regulations is the factoring in of the agencies charged with maintaining the commons as actors subject to the rules and standards set. The contradiction inherent in the enforcers of the regulations being themselves actors, is not resolved.

No standards are set for the commonly used or shared spaces within the regulations. This leaves a lacuna in the regulations as the totality of the living environment is not catered for and continuity with other provisions is lost.

The historical concern with the common space and its management is not captured as a continuous thought process in the construction of buildings.

The regulations also create a value around the public record of building activity. it is not clear however that this record is publicly owned.

Whereas the relationship between the players may look well covered, the physical scope is left in abeyance. the point of departure is the desire of the individual to erect a structure, and the regulations react to that. When reference is made to the space that is public, this reference is tangential and herein lies a critical weakness in the regulations. Whereas the stance is to create a code, this code significantly does not address the public space in any direct - or meaningful - way. This makes the deterioration of the public domain a risky outcome despite the seeming robustness of the regulations.

This is a critical observation about the regulations as it exposes the significant gap in the thinking about the management of urban construction process. When no standard has been set for the common resource, its quality is not protected and deterioration can creep in with the great risk of negative impacts of quality of life and the operations of the city.

5.4 Synthesis and Interpretation of the Findings

It is the intention in this chapter to induce some suggestions on how we can improve the building regulations in order to fill the identified gaps and create a more rigorous regulatory regime. In this study, we have been on a journey to explore how the building regulations have evolved to the current statement and how they now relate to the urgent task of reforming and restructuring our urban areas.

Justification for this approach is provided fundamentally by the fact that this kind of review is already going on. Kenya have been struggling for quite some time to bring forth a new regime of building regulations. Whereas these efforts are seen to be necessary for the improvement of the housing situation, they do have an implication in the overall quality of urban life.

Other jurisdictions have also made a serious effort to reform in the building regulations. Examples that have been cited in this work include Australia which made a serious effort to restructure their building regulations and employ them for the improvement of their urban situation.

It has actually been suggested that building and land use regulation is the most effective tool for reducing disaster and chronic risk in the developed world (World Bank/GFDRR). International conferences have been mounted around this question and conventions agreed upon to focus on disaster reduction within urban areas. (Sendai, Hyogo, Yokohama)

A major exercise was conducted by the government of the United Kingdom to create a new set of building regulations as part of their efforts to modernise and structure their industry. Other countries that have undertaken a serious examination of the regulatory regime include Singapore and South Africa. There is no doubt therefore that an international consensus seems to have developed around the importance of building regulations.

5.4.1 Recap of Learnings from the Underlying Philosophy of Regulations

This study has relied on historical developments relating to the regulation of the building process for its key arguments. This is in pursuit of the fundamental intentions of the regulations.

In the survey of historical development to try and trace the philosophy that underlies the regulations, we were able to establish that indeed it is for the survival of cities that regulations were instituted. We established that the crisis within the industrial towns created a new role for government from the recognition that it is in the common domain, in the shared domain, that the deterioration of life occurs. It was a critical turning point in the mindset of the people that when

dealing with the commons only an authority higher than the supervising mechanism would be able to take full responsibility of the broad network and system that is needed to ensure a decent living environment.

The institution of a role for government through newly enacted laws and especially the Public Health Act in 1848, allowed for new thinking to take root. Just as significant was the recognition that it is science that provided the most solid justification for the institution of regulations. This then elevated the question of how individuals can go about creating buildings within the urban environment to an existential question; it became clear that if the actions of individuals were not controlled then danger for the entire society could be lurking within.

It is however important to remind ourselves that these developments were coming up against the argument that human beings ought to have the freedom to build and to seek shelter in the best way they know. In a modern environment one can almost see the argument of basic human rights being released end probably a fight being mounted to preserve the freedom of each individual to build as they wish. The big limiting factor within urban environments is that there is a system of services and that system is of necessity, shared. The protocols of sharing cannot be left to individuals to determine and a basis exists there for authority to have control over the system.

The newly acquired ability to control large-scale diseases and other vagaries of urban environments allowed cities to grow with a certain predictability and to deliver the quality of life that the new industrial development promised. It can be observed that a failure to control the health issues surrounding industrial cities would have been catastrophic for society and could have led to a big part of the population experiencing a very low quality of life.

This is an important observation and it helps to reveal the spirit that underlies the whole regime of regulations that we have today everywhere. The regulations then have a justification that pivots around two critical points; one is the need to preserve life by mitigating against the threats to good

health and also threats to the structural stability of buildings. Anything that may threaten life would have to be seen as a threat to the very existence of the population. A secondary justification is the preservation of human dignity which manifests in the application of proper anthropometrics, provision of sufficient sanitary accommodations etc.

The second of this critical part is the protection of the common domain which includes the services that make water supply and road and street spaces and also crucially, the water drainage system. In whichever way these concerns are expressed, they are critical for the preservation of human civilisation and indeed for the proper working of society.

Urban resilience at its core is the continuity of the preservation of a city entity's ability to continue sustaining life. By that we mean the ability of the city to continue providing the necessary goods and environments that make life bearable and enjoyable. In an earlier chapter we have discussed this and demonstrated that there are few facets that contribute to this health of the city. These include the metabolism of the city in the form of inputs and outputs arising from daily life. The other important facet is governance and that can be interpreted to mean the ability of the system to harness the abilities of every individual for the common good. Governance which here includes the implementation of regulations, is a system whose basic role is to channel the energies and resources of individuals to the delivery of benefits for all. Governance recognises that the pool of energy required to develop and grow the city resides in the citizens, their actions and their resources.

We can see then that the governance instruments including the building regulations ideally aim to channel the energies of citizens to an outcome that is agreeable and uplifting for all. This tallies with our observation that urban resilience is a designed condition. It is a result of deliberate and considered actions by its citizens. What we are looking for as an outcome is a situation where the activities that are necessary for the continued development of the city are indeed geared towards an

outcome that is favourable for everybody and in a station where people are able to acknowledge and accept the values it represents.

Thoughts about improving the regulations would have to be guided by this observation about the spirit that drives them. It would seek to fine-tune the whole process through which people get to accept the regulations as good for them and therefore adhere to the dictates or direction they are setting.

The educative values within the regulations become crucial in winning over the people and getting them to adhere to the regulations for their own good. The demeanour of the regulations tending towards facilitative and persuasive language is critical to their deeper acceptance.

5.5 Summary of Findings

The picture that emerges from the examination of the regulations against the set framework is complex. It broadly leans toward a conclusion that, as stated, the regulations deliver important guidance to the population on how to maintain a livable and sustainable environment. However, gaps are discernible; gaps that relate to a poor or incomplete appreciation of the dynamics and inevitable relations in the urban environment.

Especially, the regulations have a weak communication of the environmental context in which the building process happens, and therefore responsibility for that context is weakly defined and assigned. This is an area of immediate improvement. Significantly, it contributes to an understanding of the dynamics that cause the shared domain to continue deteriorating despite the availability of a robust set of building regulations.

Chapter 6 **Enhancing Building Regulations**

Towards a More Robust and Persuasive Regulatory Framework

6.1 Introduction

The objective of this chapter is to propose suggestions for improving building regulations, addressing the identified gaps, and creating a more rigorous regulatory regime. This objective aligns with the research goals of this study, which draw on the evaluation of Kenyan building regulations and insights gained from examining the underlying philosophy of these regulations.

Throughout this study, we have embarked on a journey to explore the evolution of building regulations and their relevance to the pressing task of reforming and restructuring urban areas. The justification for this approach is rooted in the ongoing review of building regulations. Kenya, in particular, has been grappling with the need to establish a new set of regulations to enhance various aspects, including housing and overall urban quality. Similarly, other countries, such as Australia, have made substantial efforts to reform their building regulations to improve their urban situations.

Building and land use regulations have been recognized as the most effective tools for reducing disaster and chronic risk in the developed world, as emphasized by international conferences and conventions focused on disaster reduction within urban areas, such as the Sendai, Hyogo, and Yokohama frameworks.

Several countries, including the United Kingdom, Singapore, and South Africa, have conducted significant exercises to create new sets of building regulations as part of their modernization and structural industry efforts. This indicates an international consensus on the importance of building regulations.

6.2 Findings and their Significance

By establishing that urban resilience is ingrained in the collective consciousness of a community, it becomes apparent that the continuity of resilience relies on the presence of a moral framework that guides individuals to act in ways that ensure the ongoing viability of the shared habitat. The building regulations play a crucial role in cultivating this moral framework, thereby increasing the likelihood that individuals will make decisions that contribute to the greater good within their available sphere of action.

Reflecting on the shortcomings identified in the previous section, the focus now shifts to how the thrust of the regulations can be directed towards this overarching goal.

6.2.1 Learnings from the Underlying Philosophy of Regulation

This study heavily relies on historical developments pertaining to building regulation to support its main arguments. The exploration of the underlying philosophy of regulations reveals that their establishment was fundamentally driven by the need to ensure the survival of cities. The recognition that the deterioration of urban life occurs in the common domain, shared by all, marked a pivotal turning point that necessitated a higher authority beyond supervisory mechanisms to assume responsibility for the comprehensive network and systems required to ensure a decent living environment.

The enactment of laws, notably the Public Health Act of 1848, bestowed upon the government the responsibility to control large-scale diseases and address other challenges in urban environments. Science emerged as the cornerstone for justifying the implementation of regulations. Consequently, the question of how individuals construct buildings within the urban environment became an existential issue, as it became evident that uncontrolled actions could endanger society as a whole.

However, this realization also engenders a subtle tension, as these understandings must contend with arguments advocating for individual freedom in building and seeking shelter in ways deemed

suitable. In modern environments, the discourse on basic human rights often surfaces, with efforts aimed at preserving each individual's freedom to build as they wish. Nonetheless, the constraints within urban environments arise from the shared nature of essential services. Determining the protocols of sharing cannot be left to individuals alone, providing a basis for authority to exert control over the system.

The newfound responsibility to control large-scale diseases and other challenges in urban environments enabled cities to grow with predictability and deliver the quality of life promised by industrial development. Failure to address health issues in industrial cities would have had catastrophic consequences for society, resulting in a significantly diminished quality of life for a substantial portion of the population.

This observation is of utmost importance and forms the underlying spirit of regulations worldwide. The regulations are justified by two critical factors: preserving life by mitigating threats to good health and structural stability, and safeguarding human dignity through proper anthropometrics and provision of sanitary facilities, and overall consideration of basic human nature. Anything that poses a threat to life must be regarded as a peril to the population's very existence. Additionally, regulations protect the common domain, encompassing services like water supply, road spaces, and crucially, the drainage system where disease-causing agents may lurk. Regardless of how these concerns are articulated, they are critical for preserving human civilization and ensuring the proper functioning of society.

Building on authorities cited, such as Rodin and Vale, urban resilience at its core entails preserving a city's ability to sustain life. This involves providing the necessary goods and environments that make life bearable and enjoyable. As discussed in a previous chapter, resilience depends on various facets, including the city's metabolism in terms of daily life inputs and outputs, as well as governance. Governance encompasses the implementation of regulations and involves harnessing

the abilities and resources of individuals for the common good. It recognizes that the energy required for a city's development and growth resides within its citizens and their actions.

Therefore, governance instruments, including building regulations, ideally channel citizens' energies toward outcomes that are favorable and uplifting for all. This aligns with the notion that urban resilience is a designed condition resulting from deliberate and thoughtful actions by its citizens. The desired outcome is a situation where activities necessary for continued urban development are geared towards benefits that are agreeable to and accepted by all, while reflecting the values it represents.

Thoughts on improving regulations should be guided by this understanding of their underlying spirit. The regulatory process should aim to fine-tune the overall framework, ensuring that individuals perceive regulations as beneficial and adhere to their provisions for their own well-being. The educative values embedded within the regulations become crucial in winning over individuals and fostering their acceptance. The tone and language employed by the regulations, tending towards facilitation and persuasion, are vital for promoting deeper acceptance.

6.3 Reflections from the Kenya Regulations

In chapter 5 we interrogated the Kenya building regulations through a framework that sought to examine the various angles that those regulations communicate to the builders. Whereas this interrogation revealed the robustness of the regulations, crucial gaps were identified. In this section we discuss some of these gaps.

6.3.1 Gaps in the regulations

We have found that the regulations contain shortcomings and discontinuities in their coverage. The regulations set out to offer a complete guidance for the envisaged environment and conceptual gaps could reveal weaknesses in the capacity to achieve this. Indeed this is what the building regulations themselves set out to do; *to propose an institutional framework for achievement of sustainable well*

planned, safe and healthy built environment. (Kenya Govt). Whereas some of the identified omissions may very well be touched upon in other documents we are duty bound to examine the context in which the issues arise and whether we will practically be able to serve the purpose of guiding the builder who is largely going to rely on the declared and published set of building regulations.

We have made the observation that the building regulations take a position and a tone in the way in which they address the process of building. This is significantly important because as we have already stated, the building regulations serve as an educational tool as well. The potency and efficiency of the regulations is to be found in the tone of language that they adopt and the demeanour, the comportment towards the builder. We have argued elsewhere that the acceptance of the values incorporated in the regulations is a critical aspect of the acceptability and therefore effectiveness.

6.3.2 The guidance of International Conventions

International conventions on risk reduction make a big point of involving the community in the formulation and application of the regulations. The reference here is to the three conventions already cited namely the Sendai Framework, the Hyogo Framework and the Yokohama strategy. Of these, more premium is attached to the most recent of them, the Sendai Framework.

A critical aspect is seen to be any involvement of the community in the overall thinking relating to the city and the acceptance that what is being delivered through these regulations is for the good and represents the ideals that people are pursuing in their lives.

The conclusion we are invited to draw from this is that the statement of regulation is expected to be understood as a friendly and communicative document. It is not in the language of legal documents or indeed of the law as would, say, be stated in an act of parliament. It is expected by these

conventions on risk reduction that a document will be accessible and that they will indeed be well owned by the community that they work for.

We must infer too that the document needs to be complete. In our arguments in the previous chapter, we have highlighted the lack of guidance relating to the space outside of individual buildings which in the main constitutes the shared domain, the common domain. If indeed this is a crucial part of the outcome that cities would be looking for, then it is only logical that it will be related directly to the other guidance offered for the building process. Omission of this part of the broad picture communicates the notion that this doesn't matter. That, in itself, would constitute not just a major weakness of the regulations but probably even a source of problematic understandings of the obligations of a builder.

We have found in the previous chapter that the regulations have a demeanour that seeks to win over and persuade the builders and other players in the process of construction to proper decisions that will be positive contributions to the shaping of the environment. This was a significant finding. Part of the struggle that has to be embarked upon in order to make the regulations effective within the society is acceptance and adherence. Acceptance will most certainly be preceded by understanding. This is crucial.

We have also taken note of the space provided for innovation and for creative resolution of design issues. Society continues to progress and new knowledge is always being made available for the processes of building. This includes the continuous introduction of new materials available for building or for approved materials. It is a desire of society to have a process that indeed is enjoyable and a process that is not a source of misery. The accommodation of creative thinking within the regulations which we have unearthed in our findings is a critical part of the way in which this regulations impact on society's contribution to the health of the city.

With these observations it is important for citizens to see that what is aimed for in creating a firm statement of regulations, is a document that can capture the spirit of the community and what can be owned by that community and become a truly living document. The goal is to create within the community, a belief in the act of building well and also builds a level of consciousness that allows players to be mindful of the good of all. A crucial interpretation here is the goal to remove a sense of antagonism that would characterise the set of regulations and cast them more as a friendly and educative guidance.

6.4 Restatement of the Urban Problem

It became clear in the earlier part of the study that the resilience of the urban environment is rooted in the actions and behaviour of the residents, the people who live there. The attitudes that people have in their demeanour towards their city are critical to the continuous ability of the city to sustain life.

Resilience is the outcome of human actions; it is the outcome of human decision-making and ultimately it is reflective of the dominant values within the society. When society determines that they indeed want to have a well ordered, well organised and physically sustaining environment, then decisions will be made geared towards that goal. Those values will then drive the formulations of the guidances that need to be put in place including laws and regulations.

The lesson from history which repeats again and again is that what tends to fail within the urban environment and causes a loss of quality of life is what is shared by the people. It is about pollution of the environment, the air and the rivers; it is about the negation of care for provisions like water quality and open space. The deterioration of quality of cities manifests in the common domain and cascades to the private domains.

Scholars of the urban environment in recent times have broadly converged on the understanding that the quality of our cities is going to revolve a lot around the public spaces and the shared facilities and how these are managed. (Gehl, Klinenberg, Glaeser, ibid). This seems to be where we

must focus to deliver order and organisation if we are to see quality in the environment that we create.

A major contribution of the regulations as predicted by the literature and historical survey that we've been through is that they must bring to the consciousness of the population the importance of the public domain and the role of each of the denizens in the building process, to take care of that space. The regulations have gone into the question of resources and the conservation of resources. In this manner, a direction is set for the necessary focus on shared resources. This explicit concern is however limited in scope in the regulations and leaves unaddressed the question of shared space and other resources including the intangible resources. Among these is the protection of vistas, the natural vegetation and other aspects of the natural environment. The pollution of waterways also falls into this category.

We have noted that the most important contributors to the shape of the city's character are the builders and the people who deliver the physical environment. These are the most important players in the level of understanding and appreciation, and feelings to the citizens is the most crucial in delivering equality of the city.

It is clear therefore that this is an area that requires attention. The goal must be to create a more complete picture for the builder who is going to rely on the statement of regulations so that they have a clear a picture as possible of their own responsibilities and where they fit into the creation of the broader city.

The Sendai Framework advises for an educational process within society. We have noted that the regulations do have a component to them which seeks to offer new understanding a new information. However, this probably needs to be complimented in a significant way.

Whereas we have made the point that the regulations are an educative document, this is a deduction from the language used within a document. However, there may be need for a more formal program

of education focused on the regulations in order that a clearer collection can be made between what is being studied and the goals it seeks to achieve. It is especially important that society is aware of the values and the critical aspects of urban design that may impact on their own lives and the quality of such lives.

To a large extent then, the urban problems manifest in the lack of a shared vision that guides how common resources are utilised for the good of all. It is noteworthy that recent scholarship has brought to the fore this dimension and related it directly to the quality of urban environments. (Ostrom,1990; Standing,2019 Hardin, ibid).

6.5 The Tragedy of the Commons

Scholars of game theory have occasionally highlighted the problems inherent in governing the common resources. As often mentioned, the concern is the dynamics at play when many individuals use a scarce resource in common. This is the kind of concern that relates to the use of physical space, a finite resource.

Garret Hardin described the ‘tragedy of the commons’ (Hardin, 1968). To restate, the tragedy of the commons refers to the situation where individuals acting independent and rationally according to their own self-interests end up producing a result that is contrary to the best interest of the whole group by depleting or causing the deterioration of some common resource. In our case we can see this as relating directly to what could happen to the common shared space in urban areas if this kind of situation was to apply. This concept has been known for quite some time. In fact Aristotle observed that “what is common to the greatest number has the least care bestowed upon it. Everyone thinks chiefly of his own, hardly at all of the common interest. (Politics, Book II, ch.3).

H. Scott Gordon (1954) has also expounded on the same logic describing the same dynamic as follows:

There appears then, to be some truth in the conservative dictum that everybody's property is nobody's property. Wealth that is free for all is valued by no one because he who is foolhardy enough to wait for its proper time of use will only find that it has been taken by another.... The fish in the sea are valueless to the fisherman, because there is no assurance that they will be there for him tomorrow if they are left behind today." (Gordon 1954, quoted in Ostrom,1990)

The phenomena of the Commons is at the centre of urban resilience. The nature of urban organisation is such that many aspects of it rely on a sharing mechanism. It is highly unlikely that an urban settlement would operate in any other way than through a rigorous sharing of resources. The moderation of this process remains a challenge of governance.

It is therefore easy to see that risk of a deterioration is always present. It pivots very much around the aspect of sharing. Urban resilience would seem to require that close attention is paid to the dynamic of the tragedy of the commons in order that mitigation measures can be formulated.

6.6 Discerning the issues that need resolution

In the previous chapter we identified a number of issues that we require to be resolved if the set of building regulations that we have in place is to be complete and to serve the purposes of urban resilience. In the main, the issues to be resolved revolve on the question of shared facilities. They also touch on the opportunities available within the regulations to deliver more education and more incentives so that creative designs can be brought out and applied to urban development.

The concept of urban resilience when looked at from the point of view of physical development revolves a lot about issues that are not personal to any particular developer and which require some measure of community action. They also in a significant way require for attention to be paid to shared resource and the public domain in whatever way it may be defined. This is the life sustaining aspects of an urban environment.

The results bring out clearly the important role of the authorities in making critical interventions. As outlined above, the tragedy that could befall a community in the use of common resources is one that requires resolution. Most scholars agree that it is in the powers of the authorities to resolve these issues for the benefit of society. Government regulations can limit the amount of a common good that is available for use by an individual and this would play a part in resolving the question of collective action or common action. (Anukwonke, 2015).

The findings lead to the conclusion that necessary fortification is required in the building regulations to make them more responsive to the issues of urban decisions and especially in the need to focus on how to secure the common domain. In the previous chapter we identified where some of these areas would be. Among them is the identification of a responsibility relating to the shaping and formulation of the commonly used space. When no specific responsibility is defined, a lacuna exists that could lead to a trajectory of decay and deterioration of that space. The formulation of the regulations would need to recognise that there would be parallel players in any particular development: on the one hand is the builder and the person who has the responsibility over a particular plot in the development, and on the other hand will be the authorities who would be responsible for what lies beyond the plot. The actions of these two required to be harmonised and synchronised to happen within a reasonable a time frame. In the main, this probably would mean simultaneously.

However, it is necessary to develop the trajectory of that thought more broadly. A single development has the capacity to be disruptive to broader systems of the city. The supportive systems including the services system, would require to respond and adapt to the new development to arrive at a unified workings of the two aspects. Guidance about this is necessary if this quest is to be tied in with building regulations so that a complete picture of where responsibility is, in real life, is available to every player. This will not only be facilitative, but will contribute to the education, in

that every player thereafter is a little better in how they understand and appreciate the bigger picture they are working in and how this particular development is contributing to the overall good of the city.

The issues that identified requiring fortification are in the analytical categories and we can look at them one by one.

6.6.1 Issues Around the Scope of the Regulations and Authorities therein

We have seen that the regulations seem to have the correct demeanour towards the various players addressed. It is however necessary to re-examine this issue in order that the contradiction revolving around the supervising authorities being responsible, at the same time, for the actual development of common space, be resolved. This would be necessary in order that integrity can apply. The system to enforce set standards needs to be disagreggated from the agent that works on the space.

Extending from that logic is the need to lay out the standards that will constitute a guidance to steer the broader environment to positive outcomes. The existence of this accord is a critical part of insuring that society moves or subscribes to a particular standard. The non-existence of a statement of standards means that society is on a path without direction and ends up introducing a gap in the management of the city.

Following onto the logic of the development of the building regulations it may be fair to characterise the statement of regulations as a societal contract. Such a contract does allow for new ideas to be brought in and for creative solutions to be formulated in answer to the problems that may arise. This attitude is a critical part of the mechanism that will be in place to guarantee a measure of resilience. In essence this allows for a process of bargaining and a trade-off between various outcomes for the good of everyone. This is a critical part of the role of the authorities who are implementing the regulations during the development of a project. What is important is that

there is an entity willing and capable of negotiating and trading off with the players who initiate and drive development.

6.6.2 Issues Relating to the Demeanour and Advocacy of the Regulations

The Regulations seem to have the right spirit and advocate for outcomes that are fundamental to human existence, focussed as they are on preservation of life and the safety of everybody. If indeed understanding and comprehension of the regulations within society is a desired goal then it behoves on that statement to be persuasive and to be accessible.

The ideal in this regard is one of ubiquity of consciousness, where every person in the society is able to understand and appreciate that indeed there is a standard to be applied and maintained, and understand what that standard should be. The achievement of ubiquity within the building and construction industry may require extra innovations but it would spring from the language and basic narrative of the statement of regulations. Therefore, an improvement on the current regulations would require to sharpen the narrative and make it much easier for the public to appreciate the basic logic that informs the formulation of this regulations. It is critically important to connect these to basic issues like safety, good health and dignity of the uses of buildings for the easier understanding of all who will make reference therein.

6.6.3 The Educative Values

The regulations that we have offer education in a variety of ways; among the most important is the communication of what formulations would be “deemed to satisfy” the overall picture.

This “deemed to satisfy” approach allows for a builder to have a fairly clear picture of a possible outcome that would be satisfactory for the authorities. There are other ways in which the regulations are continuously educating the population. The dictating of particular materials to be used is one such. In this way builders become conscious of the fact that certain materials may not have the strength or the characteristics that may have required in order to perform certain tasks.

This allows the builders to reflect and understand why the choice has been limited and to understand some of the more technical logic that apply.

The other critical aspect of education that is contained in the regulations is the insights on quality and standards. Standards are communicated in various ways including the already mentioned *deemed-to-satisfy* provisions, but in other aspects of the regulations, performance standards are indicated. Significantly the regulations also continuously introduce an aspect of minimum standards. On the face of it this would create controversy and might be interpreted to be encroaching on the freedoms of individuals. It is however probably one of the more important contributions of the building regulations; the laying down of certain minimum standards beyond which you would be risking a calamity or a difficult problem for everybody. Examples have been cited earlier on this question of minimum standards.

More research may be required to develop fully the justification of applying minimum standards as part of the general regulations, to untangle the logic of directing a human task as basic as the provision of shelter.

It bears caution on this matter, because underlying it is the complex situation of relationships and interests in the urban areas. Risks to the urban fabric are high and there is not a lot of room for errors and mistakes to be made. The authorities are justified to compel an approach without offering much immediate justification for it, in order that the common interests and the population's safety, are well secured. The need for a justification for minimum standards however always exists, if acceptance of the regulations among the population is a valid goal.

6.6.4 Issues Around Incentives within the Regulations.

Custodians of the common good would want to see an outcome that assures on the continued health of the city. This however is not a certainty given that the physical developments within the city are

going to be the results of design. The outcomes of designs are not always predictable and may provide creative but unexpected solutions.

It behoves the authorities then to try and nudge the designers and developers towards those outcomes that are seen to offer benefits to a broader the section of the population. Authorities have several tools available to them in formulating incentives and penalties that may be given. Among these is taxation where the authorities may impose a tax if a certain design outcome is preferred that may however constitute a risk to the broader population. The opposite dynamic is that builders may be given certain concessions if they are able to provide benefits that are seen to be of value to others.

Whereas other jurisdictions offer this kind of incentives with greater frequency, the Kenya building regulations seem to be shy to apply this line of thinking. (See Productivity Commission, 2004,). It remains available to them - and would constitute an improvement - if we are to encourage builders towards outcomes that will contribute to the broader health of the city.

6.6.5 The Issue Regarding the Commons in the Regulations.

The outcomes of this research shed light on the imbalance within the regulations relating to the responsibilities of various players and an understanding of why this is a negative outcome. What I believe has emerged as a result is a basis upon which the regulations can be recast. My finding is that the agency charged with that maintenance of the commons is not well factored, and the inherent contradiction relating to the role of the enforcers of the regulations - being themselves responsible for the neutral space - has not been resolved.

My observations emphasise the importance of making a direct connection between the activities of a single developer or player on the one hand, to the values of the community as expressed in the shared resources. The historical connections explored in the research and the expressions in various document point to directions upon which innovations can be made. I believe this is a key

contribution of the research and provides a logic for the reformulation of the building regulations and the emphasis within them.

Further research may be required into the mechanism of developing standards for the shared resources and implementing the standards. The question of how public authorities may be mobilised to timely response to the dynamics created by private developers remains unanswered. It is however clear from this work that without working together urban resilience may remain unattained.

A clear gap for improvement of the current regulations is therefore indicated in this situation. A mechanism for incorporating the actions of public authority during the construction process of a particular building is necessary. This invites us to make the recommendations that the regulations should be recast to factor in other players who will respond to pertinent dynamics simultaneous with the development.

6.7 Summary of Recommendations

In summary, the recommendations made for the improvement of the building regulations are tabulated in the accompanying table.

Table 6.1: Summary of Recommendations for improving the Building Regulations

Issue	***The identified shortcoming***	***Proposed Solution***
The Scope of the Regulations	Contradiction in maintaining the enforcer of the regulations as the custodian of shared resources	Disaggregate the responsibilities to allow room for oversight over the responsible entity.
	The lack of a clear guiding statement on to guide the development of the contextual space of buildings	Develop a statement of intention and specify the standards to apply.
	Lack of a structure for negotiation and trade offs	Institution of a process for negotiating necessary actions and tradeoffs.
Demeanour and advocacy in the Regulations	Low level of persuasiveness and accessbility	Aim for ubiquity of consciousness about standards to be applied and maintained
	Incoherent narrative to the statement of regulations	Sharpen the narrative and highlight the basic logic, connecting to safety, health and dignity in use of buildings.
The Educative values	Insufficient insights into quality standards applied	Clearer justification for the standards applied to improve acceptance.
		More research into the justifications of minimum standards.

The application of Incentives	Lack of sufficient nudge effort for the desired outcomes	Clearer use of the strategy of incentives
Incorporation of the common resources in the regulations	Agency for maintenance of the commons not well factored	Need to make a connection between developers and community values.
		Further research required to clarify this connection
	Lag in public response to private actions	A mechanism need to embed public concerns into actions of private players.

The reinforcing action that could be taken to make the regulations more effective, focus on creating and enhancing the persuasive power inherent in the regulations. The goal is broadly to entrench a moral framework that raises the probability that every individual will, on their own accord, act in the general trajectory of a well-balanced environment. To do this, it is necessary to pay attention to the scope of the regulations, the content and guidance they carry, and the demeanour they have to the endeavours of the citizens.

Chapter 7 **Conclusion**

7.1 Summary Statement

An inquiry into the building in regulations in the context of rapid urban development with a concern for resilience will inevitably trend on areas of conflict, tension and contested space. This research has revealed that the mechanics of regulating the building process inherently constrains rights and privileges that may be considered by some as God-given. The dynamics of urban living introduce the concept of sharing in a rather urgent and compelling way. History has shown that this could turn into an existential threat when specific and deliberate measure are not taken to steer the process.

The actions of individuals in the development or improvement of the properties have implications that go well beyond what would be the limits of the property. Sometimes these implications are not obvious to the developer and there is no broad consciousness of the way in which these externalities create a completely different big picture. This asymmetry of information is the most likely cause of tensions and conflicts. This conflict may result in a passive resistance within the community, or indeed pushback against any regulations.

Urban resilience however requires that there is a level of shared consciousness within the population that lives in a particular area. It is this that will underpin the development of protocols for the resources – foremost of which is space- that are shared. When common knowledge is sufficiently enrichened and is supportive of the values that fortify the common interests, a higher probability is created for a resilient, vibrant and accommodating living environment.

Within the study the argument has been made that resilience is an outcome of conscious decisions within the population. Resilience is a designed condition and actions taken one way or the other will

have an implication on this outcome. The basis of decision making within the population is to a very big extent, driven by commonly held values.

The scholarship of urban dynamics has not given due attention to the value of ubiquitous knowledge. It is not clear from the literature how far common knowledge goes towards creating the necessary environment for a stable and sustainable environment. It is probably an area of study that requires more attention. Part of the contribution of this research is in highlighting this matter and hopefully pointing to a direction of further research.

Ubiquitous knowledge leads to a moral framework that ingrains in the population a way to determine what is good or bad, i.e develops a moral framework. This moral framework is intangible and how it changes and transforms would be the subject to deeper studies in other branches of knowledge. The scholarly work relating to the governance of the commons (Ostrom,1990; Standing,2019) is beginning to make important contribution to this understanding.

A re-reading of the works of recent contributors on urban quality, (Klinenberg, 2018; Harvey,2009; Laundry, 2008; Gehl,2010) broadly support this idea that the sustained quality of urban areas and cities is a communal affair and requires an active consciousness of the matter.

In order for the building regulations to be effective in enhancing their resilience of the built environment they need to capture the primacy of the commonly held spacial resources and to develop guidance in the way they are shaped. This will be in keeping with the historical orientation of the regulations. As noted within the study the new genesis of building regulations had the goal of answering the urgent need to rescue cities as collective living environments from becoming a danger to life and failing in the basic purpose of providing shelter.

In this study we have also, seen the significance of dimensions of the regulations. Among these are the demeanour of the regulations and the level of authority that they project. This dimension is important if society is going to be incorporated into the overall mission of creating a resilient urban

environment and especially in the actions that individuals may take in the development of the urban fabric.

7.2 Contribution to Knowledge

This research lies at the intersection of several bodies of knowledge mainly in those areas that deal with the built environment. It is the firm believe that indeed the outcome of this study will support innovation and contribute to knowledge in all those areas. I place special premium in the fact that this study has been conducted in the background of a rapidly developing urban environment which means that all the tensions and conflicts are in full display within our cities.

The outcome of the research should raise the level of sensitivity among architectural designers to the issues of context.

In the main the question of what happens in the generic space that is shared between one building and another should now come to the fore and should be a factor is the way the design is resolved and the choices that are made. The broad responsibility to contribute to the quality of the overall environment and not to limit responsibilities to boundaries of a single property is an important part of the responsibilities that the architects and other designers have. Our contribution in this research fortifies the awareness of this dimension and to provide the necessary rationale for the broadening of this responsibility.

This research especially, makes a big contribution to the area of urban design. Primarily the research makes for a logic for intervention of the communal skill and a business to override individual interests. This is a useful basis on which to peg the argument for a place on the design team for urban designers. The field of urban design has not been sufficiently accommodated in the process of making decisions relating to the environment. If urban design and urban resilience are to be considered to be critical issues in policy formulation then the necessary accommodation must be

made to the insights and science of urban design to be fully incorporated in those decisions. This research will contribute to reinforcing that argument.

An important outcome of the research is the framework developed to assess the building regulations. This framework is applicable as a tool of governance and management to help predict the quality of regulations that are being put in place, and to see that they are responsive to the broader concerns of resilience of cities and towns. Such a framework has not been available in the literature that we have looked at but can now be assessed through this work and applied in the various exercises that are inevitably going to be mounted as we urbanize.

In the area of building technology the study establishes that the responsibilities of the builder go beyond the individual concerns to aspects that are broader and shared within society. The importance of this is that builders have appropriated a scope of responsibility that has sometimes been stated in the various guidances is available. It may be necessary for the sake of our cities and our towns that the responsibilities of an individual builder be broadened so that they may take responsibility for the contribution that they make towards the condition of the city.

7.2.1 Specific Recommendations

In targeted fashion, specific audiences will benefit from the insights of this research work.

To the academic discipline: This study took the firm decision to adopt a qualitative approach to the questions at hand. Within the specific academic environment of the University of Nairobi, this is significant for the fact that this approach has received substantial support through completed works. It is my belief that some interactable research question in the discipline can be effectively addressed by embracing a qualitative approach unashamedly.

7.2.1.1 For the academic discipline

It is my belief that this work adds to the understanding of the proper orientation of the discipline of architecture. In the analysis of the Kenya existing and proposed regulations, we have used a tool

that disaggregates the various dimensions involved in the decisions we make as architects. Quite apart from the concerns of our clients and their properties, we have shown that the cultural context and the broader environmental context matters and must be taken into account for the good of all. This point should percolate to the fundamental training of the architect in an area like site analysis, or post occupation analysis. These areas, to be complete and meaningful, must consider the broader context of the projects at hand. Success can only be truly measured when this is taken into account.

7.2.1.2 For the practice of the profession

The practice of architecture can also benefit from the extrapolation of this thought. The organization of how the profession offers its services to the public inordinately focus on individual actors as "clients" concerned about properties on which they have full control. What is missing is the mechanism that allows the public and more specifically the public space, to benefit from the expertise of the architect. In a civil society, this is contradictory as the profession has the responsibility to articulate the best outcomes. It behoves the organized profession to structure such a mechanism that delivers the benefits of architectural expertise for the benefit of society with consistency and predictability.

7.2.1.3 For the research community

This work has not answered every question and indeed has exposed area that require further research. Especially, research is required into other aspects of the built environment that have a bearing on the resilience of the urban environment. These include on how to achieve more effective shared spaces. Critical dimensions include their formulation, self regulation and easier control.

The nature and philosophy underlying the institution of minimum standards on a population also begs for further research. The historical dimension discussed in this work would suggest that it is responsible to impose such standards. However, the political dimsnsion that requires the

involvement of citizens in the decisions that affect them, suggests that a nuanced process would be required. The resolution of this dilemma is a clear area for more research.

Further, this work has revealed that the dynamics of a shared environment raises question as to the most effective guidance for it. The nature of the whole does not correspond to the sum of the parts and the totality of development of individual parts raises dynamics unique to that scale. This is a matter that calls for more understanding through research.

7.2.1.4 For policy makers

Within this work a structure has been developed to test the efficacy of any set of building regulations. I believe such a structure is needed as the rate of our urbanisation increases. It is especially needed in the new emerging towns where the speed of development would require faster regulatory response for the good of society. The framework developed in this work would help focus such regulatory instruments.

7.3 The Learning (Philosophy statement)

It is appropriate to take stock of what we have learned through this research. Some of the learning has taken us to a relatively philosophical plane while there is some learning that is more pragmatic and accessible. A key lesson that has come through reveals that there is a huge amount of knowledge that is embedded in human phenomena. As in the theory of unexpected outcomes, we discover that the trajectory of human history is shaped sometimes by completely unexpected forces. One would have been hard pressed to recognise the genesis of the governance of urban areas in the outbreak that engulfed Europe in the very early part of the second millennium.

The unfolding of the necessary response to that crisis takes us through some surprising terrain among which is the whole set of laws that came to be known as The Poor Law and which contributed a lot to the foundations of the current building regulations. The creation of these laws

and the physical institutions that accompanied that effort, was a daring attempt at social engineering through which we can learn a lot about what is possible and what is not. Poor law raised critical moral questions and the resultant enquiry into some of the difficult issues in the institution of this law are with us today. The building regulations are just but one manifestation of these results.

The process of research rewards us by revealing some of these connections.

It allows us to have informed insight and makes for a nuanced approach in the consideration of human phenomena. At another level, research allows us to appreciate the complexity of phenomena and to seek deeper understanding when we seek to explain issues that we may be taking for granted otherwise.

Some of the important lesson that with gather from this research is that the lonely efforts of committed pursuits of knowledge can have positive and highly consequential outcomes for society. The case that stands out in this aspect is the work of Sir Edwin Chadwick without whom the Public Health Act would probably have taken much longer to emerge. His dogged approach to the challenge that he saw gets its reward in the huge impact he has had over the years . The power of his insight and commitment that he brought to this task stands as an exampler of the possibilities of committed individuals and as an inspiration for future actors.

The critical dimension in the process of regulations that this study has identified is to do with the public domain. It is instructive and to a degree a validation, that influential contemporary scholars are rallying around this aspect of urban life. As an example, Jan Gehl has developed great influence through his writing that focus on public space.

The quality of urban life is underpinned by the quality of the public domain, which inevitably is shared by the denizens.

7.4 Limitations of Findings

This research is interpretative. The findings turn on the perceptions of the researcher and therefore are to a certain extent the reflection of the researcher's background and the worldview shaped by experience within a body of knowledge. It must remain in the realm of possibility that a different researcher looking at the same question from a different background arrives at a different answer and expounds a different theory. This places constraints on the theoretical space to which these findings can be generalised.

It however allows the room for variety and richness in the academic explorations. More dimensions in the approach may need to be brought on board to give a more complete understating of the dynamics at play in the research area.

Interpretative research by its very nature cannot provide pinpoint accuracy. Ultimately a degree of ambiguity is inherent and the limitations of language, or more specifically communication, are evident. These limits are part of the universal concerns about phenomenological research and point to unfinished work in fine-tuning the research methods available in this area.

7.5 The Implications of the Findings

The findings however are an important pointer to areas that have otherwise received little or no attention of a scholarly kind. This research will highlight how we nudge society to action riding on the understating that not every desirable outcome can be legislated.

The concept of resilience is inherently complex and its positive benefits will be arrived at through various channels. This research will help shape how regulations for urban physical development are formulated and will contribute to arriving at a heightened level of resilience while maintaining and preserving the basic rights of individuals in society. This is the enduring value that this research will bequeath on those who seek to work with its findings.

That is a satisfying and fulfilling outcome for the researcher and those who have participated in articulating the conclusions of the thesis.

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Appendix 1

Codebook And Frequency Of References

Name	Description	Files	References
Minimum Standards		15	391
Performance Standards		9	123
Best Practice		7	81
Deemed to Satisfy		9	59
Actor Responsibility		8	57
Structural Stability		4	55
Protection of Community Values		10	53
Compelled action		9	52
Public Health		5	51
Criminal Action		14	50
Permissive		13	44
Habitable Space standard		5	44
Ventilation		6	42
Definition of Terms		10	38
Prescription of specific materials		7	35
Certification		9	34
Quality of Materials		6	31
Expertise needed		10	30
Information Sharing		6	30
Anthropometrics		4	29

Necessary notification		9	28
Mitigation		7	28
Mandatory Requirement		5	26
Human Safety		6	24
Practicality of Use		4	24
Protection of persons at work		7	23
Drainage of Buildings		1	22
Protection of Property		5	21
Safety in Use		4	21
Protection against Water Ingress		4	20
Access to buildings		3	20
Licensing		6	19
Provision in Design		2	18
Site Hygiene		5	18
Sizing		2	16
Protection of Public Goods		5	16
Power to prohibit		7	16
Stability of Structure		5	15
Sanitation		6	14
Provision of needs		3	14
Siting of Buildings		4	14
Specified Penalty		12	13
Elements that contain Fire		2	13
Special cases		4	13
Prohibited Activities in Buildings		8	13
Universal Access		2	13

Scope of Powers		2	13
Aesthetics		3	12
Air Quality		4	12
Forbidden Materials		3	12
CRITICAL PROVISION		3	10
Public safety during construction		2	10
Restrictive		2	9
Adequacy of Light		2	8
Shared Space		3	8
Good Workmanship		5	8
Structural Integrity		4	8
Water Quality		2	7
Nature of Soil		3	7
Sanitation		2	7
Power to Inspect		5	7
Minimum provisions		2	6
Environmental Sensitivity		2	6
Material Usage		3	6
Carriageway design		1	6
Service Space		4	6
Safety of Structures		4	6
Direct Action by authority		2	5
Safety at work		2	5
Refuse handling		2	5
Small Building		3	5
Temporary Building		3	5

Protection of Urban vista		1	4
Drainage		2	4
Mandate of Council		1	4
Shared resources		1	4
Educational information		1	3
Space for Office work		2	3
Maintain information update		1	3
Handling of Moisture		1	3
Adherance to Planning Standards		2	3
Accommodation for Pedestrians		2	3
Lighting		1	3
Resource Stewardship		2	3
Agriculture Buildings		1	3
Limit of Requirement		1	2
Advocacy		1	2
Fire Safety		2	2
Prescribed Coding		1	2
Adherence to set standards		2	2
Protection of Life		2	2
Water resources		1	2
Protection of Service lines		1	2
Repair Work		1	2
Risky hazards		1	1
Drainage of waste water		1	1
Handling of Food		1	1
Preparation area		1	1

Storage of Food		1	1
Health		1	1
Laundry		1	1
Handling of Pests		1	1
Declaration of Zones		1	1
Dangerous materials		1	1
Negotiated Guidance		1	1
Property Owner Relationships		1	1
Privacy of Individuals		1	1
Responsibilities		1	1
Adequacy of sanitation		1	1
Scale of Action	Child node for Scope	1	1
Attitude		0	0
Disaster Management		0	0
Showers		0	0
Integrity of Shelter		0	0
Refuse handling		0	0
Defence		0	0
Observance of terrain		0	0
Standards of Work		0	0

Appendix 2

Clause Classification into Code

Workmanship	[KK213]CONCERN FOR GOOD WORKMANSHIP
Work on site	[KK210]PRESCRIPTION ON HOW TO FILL THE SPACE CREATED
Timeline of actions	[KK10]PERMISSIONS ARE TIME BOUND
Timeline of actions	[KK13]APPROVALS ARE TIME BOUND
Timeline of actions	[KK14]TIME BOUND APPROVALS
Special case	[KK159]SPECIFIC RECOGNITION OF FIRE RISK INHERENT IN A GARAGE
Special case	[KK160]SPECIFIC PRESCRIPTION OF DETAILS FOR GARAGE AREA
Special case	[KK164]CONCERN FOR SPECIFIC RISK OF BUILDINGS FOR STORAGE
Special case	[KK167]HIGH STANDARD SET FOR LARGE STORAGE BUILDINGS.
Special case	[KK175]LIMITATION OF COMPARTMENT SIZE IN STORAGE BUILDINGS
Special case	[KK177]SPECIFIC STANDARD FOR WAREHOUSE CLASS OF BUILDING
Special case	[KK211]DETAILED PRESCRIPTION ON HOW TO DEAL WITH SOME SPECIAL CIRCUMSTANCES
Special case	[KK276]SPECIAL CONCERN FOR AVAILABILITY OF DRINKING WATER
Special case	[KK332]TROUGH CLOSET TO REQUIRE SPECIAL COUNCIL PERMISSION
Special case	[KK358]COUNCIL TO PAY ATTENTION TO THE POSSIBLE USE OF PAIL CLOSETS
Special case	[KK361]VENTILATION TO BE GUARANTEED FOR PAIL CLOSET

Small buildings	[KK103]RELAXATION OF REQUIREMENTS FOR SMALL BUILDINGS
Small buildings	[KK128]EASING OF THE REQUIREMENTS FOR LOW BUILDINGS (ONE STOREY)
Small buildings	[KK146]SPECIFIC FIRE REGULATIONS FOCUSSED ON SMALL HOUSES
Small buildings	[KK243]EXEMPTION FOR SMALL WORKS ON STRUCTURAL DESIGN
Siting of building	[KK286]UNOBSTRUCTED OPEN SPACE REQUIRED OUTSIDE THE WINDOW.
Siting of building	[KK287]DETAILS PRESCRIBED TO ENSURE WINDOWS HAVE FREE FLOW OF AIR INTO HABITABLE SPACE.
Site hygiene	[KK31]SANITATION TO BE PROVIDED DURING CONSTRUCTION
Site hygiene	[KK32]A LOWER STANDARD OF SANITATION MAY BE PROVIDED BY THE COUNCIL
Site hygiene	[KK40]RESTORE CONSTRUCTION SITE TO NEATNESS
Site hygiene	[KK82]PROTECTION OF WORKERS ON SITE
Site hygiene	[KK83]CONCERN FOR THE NATURE AND PREPARATION OF BUILDING SITES
Site hygiene	[KK86]NEED TO CLEAR ORGANIC MATERIAL
Scope of Powers	[KK3]ABSOLUTE POWER TO CONTROL
Scope of Powers	[KK5]POWER TO CONTROL
Scope of Powers	[KK7]COUNCIL'S FINAL WORD IN PLANS
Scope of Powers	[KK8]ABSOLUTE POWER OF COUNCIL
Scope of Powers	[KK11]ASSERTION OF POWERS
Scope of Powers	[KK12]ABSOLUTE POWERS OF COUNCIL
Scope of Powers	[KK17]POWER TO DISAPPROVE
Scope of Powers	[KK19]ABSOLUTE POWER OF COUNCIL.
Scope of Powers	[KK56]POWER OF COUNCIL TO PRESCRIBE A BUILDING LINE
Scope of Powers	[KK69]ASSERTION OF POWER OF COUNCIL TO WAIVE HEIGHT PRESCRIPTION

Scope of Powers	[KK73]ABSOLUTE POWER OF COUNCIL TO ORDER THE REMOVAL OF SUCH MATERIAL
Scope of Powers	[KK78]COUNCIL HAS ABOLUTE POWER TO PROCEED WITH TESTS
Scope of Powers	[KK79]STRICT CONTROL OF THE TESTING PROVISION OF MATERIALS
Scope of Powers	[KK93]COUNCIL HAS POWER TO EXAMINE SUBSTRATA
Scope of Powers	[KK102]NEED FOR EXPERT APPROVAL
Scope of Powers	[KK277]A STOP TAP TO BE PART OF THE WATER SUPPLY SYSTEM FOR USE BY COUNCIL
Scope of Powers	[KK313]COUNCIL MAY GUIDE TO ECONOMICAL USE OF DRAINAGE BETWEEN TWO OR MORE BUILDINGS
Scope of Powers	[KK314]PROTECTION OF PUBLIC SPACE IN LAYING DRAINS
Scope of Powers	[KK349]COUNCIL HAS POWER TO PROHIBIT WHAT ENTERS THE SEWER SYSTEM
Scope of Powers	[KK350]POWER OF COUNCIL TO DETERMINE IF TRADE WASTE HAS BEEN PROPERLY TREATED BEFORE INTRODUCTION INTO THE SEWER.
Scope of Powers	[KK351]CONNECTION TO THE SEWER SYSTEM TO BE DIRECTED BY COUNCIL
Scope of Powers	[KK353]THE MEANS OF WASTE DISPOSAL SET OUT BY COUNCIL
Scope of Powers	[KK370]COUNCIL POWER TO ENFORCE MINIMUM STANDARDS EVEN BY STOPPING OPERATIONS
Scope of mandate	[KK1]SCOPE TO COVER ALL STRUCTURES
Scope of mandate	[KK16]APPROVALS ARE SPECIFIC
Scope of mandate	[KK23]CONCERN FOR AGRICULTURAL BUILDING
Scope of mandate	[KK81]ABSOLUTE POWER OF COUNCIL ASSERTED
Scope of mandate	[KK90]CONCERN FOR BOTH THE DESIGN AND CONSTRUCTION
Scope of mandate	[KK140]IDENTIFICATION OF SPECIFIC HAZARD AND THE REMEDY
Scope of mandate	[KK352]COUNCIL CAN INTERVENE TO REMOVE ANY UNAPPROVED CONNECTION TO SEWER

Scale of actions	[KK9]IRRELEVANCE OF SCALE
Scale of actions	[KK20]MINIMUM CONCERN OF THE REGULATIONS
Requirement of structural strength	[KK108]SPECIFIC REQUIREMENT TO SUSTAIN AND TRANSMIT THE LOAD
Reference to science	[KK75]DEMAND TO CONFORM TO LATEST EDITIONS EMPHASISES NEED TO KEEP UP WITH SCIENCE
Reference to science	[KK238]EMPHASIS ON THE NEED TO TEST FOR STRENGTH AND CONSISTENCY OF MATERIALS
Reference to science	[KK245]CAUTION ON THE USE OF WELDING IN THE CONSTRUCTION USING STEEL
Provision of latitude	[KK145]INCLUSION OF A DEEMED TO SATISFY PROVISION.
Provision of latitude	[KK157]DEEMED TO SATISFY PROVISION PROVIDED
Protection of Vista	[KK68]PRESERVATION OF THE VIEW ON VEHICULAR ROAD
Protection of societal interests	[KK348]THE SEWER SYSTEM PROTECTED AGAINST STRUCTURE BUILT OVER IT, STIFF PENALTY FOR INFRINGEMENT OF THIS
Protection of societal interests	[KK362]ELABORATE AND SPECIFIC DETAILS FOR THE CLOSET TO ENSURE A STANDARD OF HYGIENE AND THE PROTECTION OF OTHER SPACES AND FACILITIES FROM CONTAMINATION.
Protection of societal interests	[KK363]COUNCIL TO CONSENT TO CONSTRUCTION OF A PIT CLOSET
Professional responsibility	[KK111]LOCATION OF RESPONSIBILITY ON PROFESSIONAL AND CONCESSION OF SUFFICIENCY OF THIS ARRANGEMENT.
Prescriptions on advertising	[KK406]DETAILS OF EXEMPTION CRITERIA FOR ADVERTISEMENTS PROVIDED

Prescription on soil	[KK209]BLACK COTTON SOIL TO BE ENTIRELY REMOVED
Prescription on performance	[KK87]DETAILED PRESCRIPTION TO PREVENT DAMPNESS IN THE BUILDING
Prescription on performance	[KK94]PRESCRIPTION ON METHOD OF CALCULATING THE LOAD
Prescription on performance	[KK126]DETAILED PRESCRIPTION TO PREVENT WEAKENING OF WALLS BY CHASES
Prescription on performance	[KK127]MINIMUM STRENGTH OF NON LOAD BEARING PANELS
Prescription on performance	[KK129]DETAILED PRESCRIPTION FOR STRUCTURE WHERE THE REQUIREMENTS ARE RELAXED
Prescription on performance	[KK130]DETAILED PRESCRIPTION FOR STRUCTURE WHERE THE REQUIREMENTS ARE RELAXED
Prescription on performance	[KK208]THE TRANSMITTING CAPACITY OF VERTICAL MEMBERS RECOGNISED
Prescription on performance	[KK267]DETAILS FOR THE CONSTRUCTION OF AN EFFICIENT CONTAINER ROOM FOR REFUSE
Prescription on performance	[KK323]DETAILED CONCERN FOR THE CONSTRUCTION OF VENTILATING PIPE TO MAINTAIN AND ASSURE FUNCTIONALITY
Prescription on performance	[KK342]LEVEL OF EFFICIENCY OF VENTILATION SYSTEMS SPELT OUT
Prescription on method	[KK334]FIXING DETAILS FOR FLOOR CLOSET SPELT OUT
Prescription on hygiene	[KK88]STRICT REJECTION OF ANY ASSOCIATION WITH FAECAL MATTER.
Prescription on hygiene	[KK217]DETAILED PRESCRIPTION ON HOW TO BUILD ASH PIT.
Prescription on hygiene	[KK259]REFUSE DISPOSAL SYSTEM A MANDATORY REQUIREMENT.
Prescription on hygiene	[KK260]REFUSE DISPOSAL MECHANISM TO CONNECT WITH BROADER MUNICIPAL SYSTEM

Prescription on hygiene	[KK261]MANAGEMENT OF REFUSE FOR BUILDINGS ABOVE THE GROUND MADE MANDATORY
Prescription on hygiene	[KK262]DETAILS OF PROVISIONS FOR THE REFUSE CHUTES SPECIFIED
Prescription on hygiene	[KK312]SURFACE , STORM WATER MUST NOT BE MIXED WITH SEWER WASTE
Prescription on hygiene	[KK328]WC TO BE CONSTRUCTED TO MAINTAIN FUNCTIONALITY AND BASIC HYGIENE
Prescription on hygiene	[KK329]INTEGRITY OF THE WC SYSTEM TO BE MAINTAINED
Prescription on hygiene	[KK346]BASIC HYGIENE TO BE PROVIDED FOR IN LATRINE ACCOMMODATION
Prescription on hygiene	[KK384]SHOWER A REQUIREMENT
Prescription on hygiene	[KK403]SANITATION
Prescription on fire safety	[KK375]DETAILED PRESCRIPTION ON MEANS OF ESCAPE IN CASE OF FIRE.
Prescription on fire safety	[KK376]MEANS TO FIGHT FIRE TO BE INCLUDED
Prescription on access	[KK52]MEANS OF ACCESS TO BUILDING PRESCRIBED TO INCLUDE SECONDARY ACCESS
Prescription on access	[KK53]DWELLING REQUIRED TO HAVE ACCESS TO STREET
Prescription on access	[KK54]EXTERNAL PASSAGE PRESCRIBED IN DETAIL
Prescription on access	[KK63]STREET SPACE WIDTH PRESCRIBED
Prescription of Standard	[KK182]THE HIGHER STANDARD TO APPLY WHERE CONFLICT IS ESTABLISHED.
Prescription of Standard	[KK183]BIAS FOR THE HIGHER STANDARD WHERE INTERPRETATION MAY BE AMBIGUOUS

Prescription of Standard	[KK185]SPECIFIC STANDARD SET FOR PUBLIC BUILDINGS ON FIRE RESISTANCE.
Prescription of Standard	[KK272]SPECIFIC STANDARD FOR THE SYTEM OF WATER SUPPLY
Prescription of Standard	[KK273]FURTHER EXPOUNDING ON THE STANDARD
Prescription of Standard	[KK293]A STANDARD EXPECTED IN THE PROVISIONS FOR A KITCHEN
Prescription of Standard	[KK330]REQUIREMENTS FOR URINALS STATED AS PERFORMANCE STANDARDS.
Prescription of Standard	[KK394]PRESCRIPTION
Prescription of method	[KK141]SPECIFICATION OF METHOD OF FABRICATION
Prescription of method	[KK302]PRESCRIPTION ON HOW TO VENTILATE A SHOP THAT MAY BE BACK TO BACK
Prescribed standard	[KK74]BENCHMARK STANDARD FOR MATERIALS AND WORKMANSHIP IDENTIFIED
Prescribed standard	[KK75]DEMAND TO CONFORM TO LATEST EDITIONS EMPHASISES NEED TO KEEP UP WITH SCIENCE
Prescribed standard	[KK113]DETAILED PRESCRIPTION ON SECURING THE STABILITY OF WALL
Prescribed standard	[KK161]SPECIFIC STANDARD REFERENCED FOR GARAGE
Preference for prose in prescription.	[KK100]GRAPHIC PRESCRIPTION, NO DIAGRAM
Preference for prose in prescription.	[KK101]GRAPHIC PRESCRIPTION OF FOUNDATION, NO DIAGRAM
Mitigation of relationships	[KK43]MITIGATION OF RELATIONSHIP WITH NEIGHBOURS

Mitigation of relationships	[KK50]COUNCIL TO CONSENT TO ANY EXEMPTION OF THE OPEN SPACE RULE
Mitigation of relationships	[KK149]FOCUS ON PHYSICAL RELATION OF STRUCTURE TO THE NEXT
Mitigation of relationships	[KK151]CONCERN AND PRESCRIPTION TO PREVENT SPREAD OF FIRE TO OTHER HOUSES
Mitigation of relationships	[KK152]FURTHER CONCERN AND PRESCRIPTION TO PREVENT SPREAD OF FIRE TO OTHER HOUSES
Mitigation of relationships	[KK153]FURTHER CONCERN AND PRESCRIPTION TO PREVENT SPREAD OF FIRE TO OTHER HOUSES
Mitigation of relationships	[KK162]GENERAL RULE FOR OTHER HOUSES FOCUSES ON PREVENTION OF COMBUSTION AND, SAFETY OF OCCUPANTS
Mitigation of relationships	[KK174]FURTHER CONCERN FOR THE POSSIBILITY OF SPREAD TO A DIFFERENT PROPERTY
Mitigation of relationships	[KK186]FURTHER CONCERN FOR SAFETY IN SHARED SPACE
Mitigation of relationships	[KK189]OPENINGS IN WALLS RELATED TO DISTANCE FROM BOUNDARIES.
Mitigation of relationships	[KK197]SPECIFIC CONCERN FOR THE SPREAD OF FIRE TO ADJOINING BUILDINGS
Mitigation of relationships	[KK199]REQUIREMENT TO MAINTAIN DISTANCE BETWEEN BUILDINGS
Mitigation of relationships	[KK354]CONCERN FOR SITE POLLUTION OR NUISANCE
Mitigation of relationships	[KK392]MITIGATION WITH NEIGHBOUR
Mitigation of relationships	[KK397]DEFINITION OF TERRITORY
Minimum standard	[KK295]A MINIMUM STANDARD EXPECTED FOR THE LARDER
Minimum standard	[KK297]MINIMUM STANDARDS FOR THE HEIGHT OF A HABITABLE ROOM
Minimum standard	[KK299]MINIMUM STANDARD FOR A DWELLING

Minimum standard	[KK300]MINIMUM DIMENSIONS FOR A HABITABLE ROOM
Minimum standard	[KK305]SPACE USED FOR HUMAN OCCUPATION TO BE REATED TO STANDARDS OF HABITABLE ROOM
Minimum standard	[KK307]PUBLIC BUILDINGS TO ADHERE TO MINIMUMS FOR DOMESTIC BUILDINGS
Minimum standard	[KK308]DRAINAGE OF BUILDINGS A BASIC REQUIREMENT
Minimum standard	[KK310]THE ROOF MUST PROVIDE SHELTER FROM RAIN
Minimum standard	[KK311]RAIN WATER MUST BE PROPERLY DISCHARGED
Minimum standard	[KK315]DRAINAGE MUST BE LAID TO EFFECTIVE MATERIAL AND GOOD WORKMANSHIP MAINTAINED TO PREVENT LEAKAGE
Minimum standard	[KK321]NO ROOM FOR DISFUNCTIONING DRAINAGE SYSTEM
Minimum standard	[KK325]MANDATORY TO ENSURE GUARANTEED FUNCTIONALITY IN THE HANDLING OF WASTE.
Minimum standard	[KK333]MINIMUM SPECIFICATIONS SPELT OUT FOR TROUGH CLOSET
Minimum standard	[KK337]MANDATORY REQUIREMENT TO PROVIDE A BATHROOM IN EVERY DWELLING.
Minimum standard	[KK340]OPENING FOR LIGHTING AND VENTILATION A MANDATORY REQUIREMENT IN WATER CLOSET
Minimum standard	[KK345]PROVISION OF LATRINE ACCOMMODATION IS MANDATORY
Minimum standard	[KK347]LATRINE, BATH, LAVATORY SUBJECT TO A MINIMUM STANDARD.
Minimum standard	[KK355]LIMITATION OF CAPACITY FOR STORAGE OF WASTE WATER
Minimum standard	[KK369]MANDATORY REQUIREMENT TO SHOW MEANS OF ESCAPE IN CASE OF FIRE.
Minimum standard	[KK371]CONTINUITY OF THE MINIMUM PROVISIONS.
Minimum standard	[KK373]MINIMUM REQUIREMENTS SET

Minimum standard	[KK377]MINIMUM STANDARDS FOR CRITICAL AREAS EMPHASISED
Minimum standard	[KK380]BASIC SANITATION MUST BE PROVIDED
Minimum standard	[KK383]ADEQUACY OF SANITATION PROVISIONS SET TO A MINIMUM STANDARD
Minimum standard	[KK387]A MINIMUM STANDARD SET FOR COOKING AREA
Minimum standard	[KK389]WASHING OF CLOTHES TO BE PROVIDED FOR. MINIMUM STANDARDS SET
Minimum standard	[KK391]MANDATORY TO PROVIDE REFUSE BIN.
Minimum standard	[KK399]MINIMUM PRESCRIPTION
Minimum standard	[KK402]MINIMUM PRESECRIPTION
Limitation of action	[KK242]STRUCTURAL DRAWING MADE A LIMITING FACTOR IN COMMENCEMENT OF CONSTRUCTION WORK
Limitation of action	[KK270]MEANS OF REFUSE DISPOSAL A MINIMUM CONDITION FOR CERTIFICATE OF COMPLETION
Limitation of action	[KK271]AN APPROVED SUPPLY OF WHOLESOME WATER A MINIMUM CONDITION FOR CERTIFICATE OF COMPLETION
Limitation of action	[KK283]A VENTILATION SYSTEM IS MANDATORY
Limitation of action	[KK288]BACK TO BACK CONSTRUCTION EXPRESSELY BARRED.
Limitation of action	[KK289]DEFINITION OF BACK TO BACK REVOLVES AROUND THE PRESENCE OF CROSS VENTILATION.
Limitation of action	[KK292]A KITCHEN IS MANDATORY TO SUPPORT HABITABLE ROOMS
Limitation of action	[KK296]COMMON PASSAGES TO HAVE A MINIMUM STANDARD IN REGARD TO AIR FLOW AND LIGHT
Limitation of action	[KK303]OUTWARD OPENING DOORS RESTRICTED

Limitation of action	[KK322]VENTILATION TO THE DRAIN MADE MANDATORY
Limitation of action	[KK357]OPEN CHANNELS FOR WASTE WATER PROHIBITED
Limitation of action	[KK364]ONLY LICENSED PLUMBERS TO CONNECT TO COUNCIL SYSTEMS
Limitation of action	[KK372]MEANS OF ESCAPE IN CASE OF FIRE A REQUIREMENT FOR STOREYED BUILDINGS.
Instruction on fire safety	[KK25]IMPORTANCE OF FIRE DIVISION WALL
Guidance on workmanship	[KK71]CONCERN FOR GOOD WORKMANSHIP
Guidance on workmanship	[KK84]PRESCRIPTION TO BUILD IN THE DRY
Guidance on workmanship	[KK85]NEED TO PREVENT DAMPNESS
Guidance on water storage	[KK274]WATER STORAGE TO BE PROVIDED FOR
Guidance on water storage	[KK400]WATER PROVISION AND STORAGE
Guidance on water action	[KK135]CONCERN FOR POSSIBLE DETERIORATION OF QUALITY THROUGH WATER ACTION
Guidance on water action	[KK136]IMPERATIVE TO PREVENT MOVEMENT OF MOISTURE
Guidance on water action	[KK139]CONCERN FOR MOVEMENT OF WATER BY CAPILLARY ACTION
Guidance on terrain	[KK105]CONCERN FOR THE NATURE OF TERRAIN

Guidance on stability of building	[KK91]DIRECT REFERENCE TO THE STABILITY OF THE BUILDING AND ADJOINING STRUCTURE
Guidance on stability of building	[KK92]DIRECT REFERENCE TO DAMAGE BY OTHER MEANS
Guidance on stability of building	[KK95]ALLOWABLE FOUNDATION OF DOMESTIC BUILDING
Guidance on stability of building	[KK96]A FOCUS ON THE TYPE OF SOIL THAT THE FOUNDATIONS REST ON.
Guidance on stability of building	[KK97]CONCERN WITH THE WIDTH OF THE FOUNDATIONS
Guidance on stability of building	[KK118]STABILITY MUST BE ENSURED AT ALL TIMES
Guidance on stability of building	[KK119]STABILITY CONCERNS
Guidance on stability of building	[KK120]PRESCRIPTION ON POSSIBLE WAYS OF SECURING STABILITY OF WALL
Guidance on soil	[KK104]EXEMPTION OF A SPECIFIC TYPE OF SOIL
Guidance on Siting of building	[KK58]SITING OF BUILDINGS TO ENSURE HYGIENIC AND SANITARY CONDITIONS
Guidance on Siting of building	[KK59]ACCESS FROM A ROAD REQUIRED
Guidance on Siting of building	[KK61]CULVERT FOR STORM DRAINAGE MAY BE REQUIRED BY COUNCIL.
Guidance on Siting of building	[KK64]PUBLIC BUILDING SITING CONTROLLED
Guidance on service space	[KK55]A SERVICE AREA TO BE PROVIDED WHOSE DIMENSIONS MUST BE APPROVED.

Guidance on scale	[KK28]TEMPORARY ACCOMMODATION CONSTRUCTION TO BE CONTROLLED
Guidance on resources	[KK21]CONCERN FOR MATERIAL OF CONSTRUCTION
Guidance on resources	[KK42]REQUIREMENT FOR OPEN SPACE
Guidance on resources	[KK44]PRESCRIPTION OF SPACE IN FRONT OF BUILDING
Guidance on resources	[KK46]LIMITATION OF STRUCTURES THAT CAN SIT ON OPEN SPACE
Guidance on resources	[KK48]RESIDENTIAL BUILDING TO HAVE OPEN SPACE ADJOINING
Guidance on resources	[KK49]DETAILED PRESCRIPTION OF THE OPEN SPACE
Guidance on resources	[KK70]CONCERN FOR THE MATERIAL USED FOR BUILDING
Guidance on resources	[KK76]SECOND HAND MATERIAL BANNED. STANDARDS TO REMAIN HIGH.
Guidance on resources	[KK80]REQUIREMENT OF A SATISFACTORY STANDARD OF MATERIAL AND WORKMANSHIP IS PROTECTED.
Guidance on Process	[KK38]FINAL INSPECTION AND CERTIFICATION TO BE MADE
Guidance on Process	[KK39]UNCERTIFIED BUILDING CANNOT BE OCCUPIED.
Guidance on Process	[KK282]AN APPROVAL PROCESS TO APPLY
Guidance on Process	[KK366]A LICENSING PROCESS FOR PLUMBERS CRITICAL TO THE OBJECTIVES OF THE REGULATIONS.
Guidance on Process	[KK367]PLUMBING WORKS TO BE SUPPORTED BY A CERTIFCATION PROCESS
Guidance on Process	[KK368]NO UNLICENCED PERSON TO BE INVOLVED IN THE WORKS

Guidance on Privacy levels	[KK344]PROTECTION OF PRIVACY OF BEDROOM?
Guidance on Plot enclosure	[KK65]ENCLOSURE OF PLOT TO BE INCORPORATED
Guidance on Plot enclosure	[KK66]LIMITATION ON HEIGHT OF BOUNDARY FENCE
Guidance on Plot enclosure	[KK67]COUNCIL HAS POWER TO INDICATE HEIGHT TO BE CONSTRUCTED.
Guidance on Plot enclosure	[KK89]PLOT BOUNDARIES TO BE IDENTIFIED
Guidance on pests	[KK212]TIMBER TO BE PROTECTED AGAINST TERMITES.
Guidance on performance	[KK77]MATERIALS MAY BE TESTED TO ENSURE COMPLIANCE
Guidance on performance	[KK117]EXEMPTION OF STRICT STABILITY REQUIREMENT ON BUT CAVEAT ON PROPORTION OF THE WALL
Guidance on performance	[KK131]SPECIFIC DIRECTION ON PARTY OR SEPARATING WALL
Guidance on performance	[KK133]STABILITY OF BOUNDARY WALL AND FENCES
Guidance on performance	[KK249]CONCERN FOR THE ANTHROPOMETRICS OF THE STAIRS
Guidance on performance	[KK256]SPECIFIC ANTHRPOMERICS A REFERENCE FOR THE CONSTRUCTION OF STAIRS
Guidance on performance	[KK257]CHARACTER OF LIFT IN BUILDING REQUIRED TO SATISFY COUNCIL AS TO THEIR SAFETY.
Guidance on performance	[KK258]REQUIREMENT FOR REGULAR MAINTENANCE OF THE LIFTS WHERE FITTED
Guidance on performance	[KK263]CONCERN FOR COMPLETENESS OF SYSTEM OF REFUSE DISPOSAL
Guidance on performance	[KK265]REFUSE CHUTE TO BE SUPER EFFICIENT

Guidance on performance	[KK266]MATERIAL OF CHUTE TO NOT CAUSE CONTAMINATION
Guidance on performance	[KK278]OVERFLOW PIPE TO BE PROVIDED TO MONITOR OVERFLOW
Guidance on performance	[KK279]CONCERN FOR PIPE JOINTS TO REMAIN INTEGRAL TO THE SYSTEM
Guidance on performance	[KK301]BATHROOMS TO HAVE MINIMUM HEIGHT FOR PROPER ANTHROPOMETRICS
Guidance on performance	[KK306]ARTIFICAL LIGHTING AND MECHANICAL VENTILATION CAN SUBSTITUTE FOR NATURAL SYSTEMS
Guidance on performance	[KK318]EFFICIENCY IN FLOW OF SEWER TO BE MAINTAINED
Guidance on performance	[KK327]ISOLATION PROVIDED BY WATER SEAL TO BE MAINTAINED AT ALL TIMES
Guidance on performance	[KK331]PERFORMANCE STANDARDS FAVOURED OVER PRESCRIPTIONS.
Guidance on performance	[KK335]PERFORMANCE REQUIREMENTS AS TO PENETRATION AND FLOW OF MOISTURE
Guidance on moisture	[KK203]DAMPNESS AND PASSAGE OF MOISTURE A CONCERN IN HABITABLE OR WORK SPACE THROUGH THE FLOOR
Guidance on moisture	[KK204]DECLARED CONCERN WITH THE PASSAGE OF MOISTURE ON FLOOR OF BUILDING
Guidance on moisture	[KK220]STRICTURE TO PREVENT THE INTRODUCTION OF A WEAKNESS IN MOISTURE PENETRATION
Guidance on moisture	[KK227]RESISTANCE TO RAIN PENETRATION A REQUIREMENT FOR CHIMNEYS
Guidance on moisture	[KK268]PENETRATION BY WATER AND BY FIRE TO BE PREVENTED.
Guidance on Material usage	[KK98]DETAILED FOCUS ON THE QUALITY OF CONCRETE USED
Guidance on Material usage	[KK99]CONCERN FOR THE GEOMETRICAL CONFIGURATION OF THE CONCRETE.
Guidance on Material usage	[KK106]SPECIFIC GUIDANCE ON THE USE OF PARTICULAR MATERIAL

Guidance on Material usage	[KK107]SPECIFIC STANDARDS REFERENCED FOR THE MOST COMMON BUILDING MATERIALS
Guidance on Material usage	[KK109]SPECIFIC STANDARD FOR STEELWORK
Guidance on Material usage	[KK110]SPECIFIC STANDARD REFERENCED FOR REINFORCED CONCRETE WORK
Guidance on Material usage	[KK112]CONCERN FOR HARDNESS AND DURABILITY OF WALLING MATERIALS.
Guidance on Material usage	[KK115]SPECIFICATION FOR STRENGTH OF MORTAR
Guidance on Material usage	[KK122]BLOCKS OF REDUCED STRENGTH BANNED
Guidance on Material usage	[KK123]BLOCKS OF REDUCED STRENGTH BANNED
Guidance on Material usage	[KK124]STRENGTH OF BIDDING MORTAR SPECIFIED
Guidance on Material usage	[KK125]MINIMUM STRENGTH OF MORTAR PRESCRIBED
Guidance on Material usage	[KK147]CRITICAL FOCUS ON WALLS
Guidance on Material usage	[KK166]CONCERN FOR THE PERFORMANCE OF SPECIFIC MATERIALS-PANELS AND METAL FRAME.
Guidance on Material usage	[KK168]NON COMBUSTIBLE MATERIALS ONLY TO BE USED
Guidance on Material usage	[KK171]STRICTURE ON COMBUSTIBLE MATERIAL
Guidance on Material usage	[KK179]STRICTURE ON MATERIAL USAGE IN HABITATS FOR HUMAN BEINGS
Guidance on Material usage	[KK187]SPECIAL PROVISION TO BE MADE WHEN COMBUSTIBLE MATERIAL USED
Guidance on Material usage	[KK188]DISTINCTION BETWEEN COMBUSTIBLE AND NON COMBUSTIBLE MATERIAL
Guidance on Material usage	[KK206]PRESCRIPTION FOR MATERIALS USABLE
Guidance on Material usage	[KK216]STRICT PROHIBITION OF COMBUSTIBLE MATERIAL IN THE CONSTRUCTION OF A HEARTH

Guidance on Material usage	[KK225]CLEAR CAUTION ON USE OF TIMBER AND COMBUSTIBLE MATERIAL
Guidance on Material usage	[KK226]FURTHER CAUTION ON USE OF TIMBER AND COMBUSTIBLE MATERIAL
Guidance on Material usage	[KK320]MATERIAL OF CONSTRUCTION OF MANHOLE AND QUALITY OF WORKMANSHIP TO SATISFY COUNCIL
Guidance on Material usage	[KK338]MATERIAL TO BE CEMENT CONCRETE
Guidance on Material usage	[KK339]MATERIAL TO PROTECT FROM WATER INGRESS IN BATHROOM PRESCRIBED
Guidance on Material usage	[KK385]FLOOR OF ABLUTION TO BE FIRM
Guidance on Material usage	[KK396]MATERIAL USE
Guidance on Maintenance	[KK319]PROVISION TO ALLOW NECESSARY MAINTENANCE OF THE DRAIN THROUGH MANHOLES
Guidance on Maintenance	[KK324]PROVISION FOR NECESSARY MAINTENANCE CHANNELS
Guidance on Maintenance	[KK336]JOINT AT FLOW TO BE EASY TO CLEAN
Guidance on Information sharing	[KK29]DETAILS OF TEMPORARY ACCOMMODATION TO BE DECLARED
Guidance on Information sharing	[KK34]COMMENCEMENT OF STRUCTURAL BUILDING AND SANITATION TO BE NOTIFIED TO COUNCIL
Guidance on Information sharing	[KK35]CRITICAL WORK RELATING TO STRUCTURE AND SANITATION TO BE INSPECTED.
Guidance on Information sharing	[KK36]VERY SPECIFIC REQUIREMENT TO INFORM THE COUNCIL
Guidance on Information sharing	[KK37]ALTERNATIVE ASSURANCE OF STANDARD WHEN INSPECTION IS DISPENSED WITH

Guidance on hygiene	[KK381]WASHUP AREA TO BE PROVIDED
Guidance on hygiene	[KK382]EASE OF CLEANING TO BE CONSIDERED IN CHOICE OF MATERIAL AND FINISHING
Guidance on hygiene	[KK388]DETAILS OF COOKING ARE OFFERED
Guidance on hygiene	[KK390]A PAVED AREA TO CONNECT ABLUTION AND HOUSES
Guidance on handling food	[KK294]STORAGE OF FOOD A CONCERN OF THE REGULATIONS
Guidance on handling food	[KK386]COOKING AREA AND FOOD STORAGE TO BE PROVIDED.
Guidance on Fire safety	[KK22]CRITICAL DISTANCE FOR FIRE SAFETY
Guidance on Fire safety	[KK24]MINIMUM DISTANCE
Guidance on Fire safety	[KK132]PARTY WALL ARE TO ADHERE TO FIRE REQUIREMENTS
Guidance on Fire safety	[KK142]VERY SPECIFIC STANDARDS FOR FIRE RESISTANCE DESIGN FLAGGED OUT
Guidance on Fire safety	[KK148]CRITICAL FOCUS ON QUALITIES TO RETARD SPREAD OF FIRE
Guidance on Fire safety	[KK150]FOCUS ON WINDOW TO ALLOW FOR ESCAPE OF HUMANS
Guidance on Fire safety	[KK151]CONCERN AND PRESCRIPTION TO PREVENT SPREAD OF FIRE TO OTHER HOUSES
Guidance on Fire safety	[KK154]CONCERN FOR THE DETAIL OF CONSTRUCTION TO PREVENT FIRE SPREAD ACROSS SEPARATING WALLS
Guidance on Fire safety	[KK155]FURTHER CONCERN FOR THE DETAIL OF CONSTRUCTION TO PREVENT FIRE SPREAD ACROSS SEPARATING WALLS
Guidance on Fire safety	[KK156]INTEGRITY OF BUILDING TO BE MAINTAINED FOR SUFFICIENT TIME TO ALLOW ESCAPE

Guidance on Fire safety	[KK163]CONCERN FOR FIRE SPREAD BETWEEN PLOTS
Guidance on Fire safety	[KK165]CAUTION TO CONSIDER OVERALL HOUSE EVEN WHEN COMPARTMENTS ARE FIREPROOFED
Guidance on Fire safety	[KK178]FIRE COMPARTMENT SIZE SET FOR OFFICE, DOUBLE THE WAREHOUSE SIZE
Guidance on Fire safety	[KK181]FIRE RESISTANCE REQUIRED IN STRUCTURAL ELEMENTS OF THE BUILDINGS
Guidance on Fire safety	[KK190]RECOGNITION OF DANGER POSED BY VERTICAL SPREAD OF FIRE
Guidance on Fire safety	[KK193]NEED FOR CONTINUITY AND INTEGRITY IN FIRE RESISTANCE PROVISIONS
Guidance on Fire safety	[KK194]CONCERN FOR THE INTEGRITY AND SEAMLESS PROVISION OF PROTECTION.
Guidance on Fire safety	[KK264]REFUSE CHUTE NOT TO BE A WEAK POINT IN FIRE RESISTANCE DESIGN OF THE BUILDING
Guidance on Fire safety	[KK281]WATER FOR FIREFIGHTING TO BE PROVIDED
Guidance on Fire safety	[KK393]FIRE SAFETY
Guidance on Fire safety	[KK395]FIRE SAFETY MEASURE
Guidance on drainage	[KK316]NECESSARY ISOLATION OF SEWER SYSTEM THROUGH TRAPS
Guidance on drainage	[KK317]INTEGRITY OF SEWER PIPE TO BE MAINTAINED
Guidance on drainage	[KK356]MECHANISM OF EMPTYING THE TANK A NECESSITY
Guidance on dimensions	[KK398]ANTHROPOMETRICS
Guidance on dimensions	[KK401]ANTHRPOMETRICS

Guidance on circumstances	[KK45]DETAILED PRESCRIPTION IN SPECIAL CIRCUMSTANCES
Guidance on circumstances	[KK309]CONSTRUCTION OF BUILDING TO PROJECT TO EFFICACY OF DRAINAGE
Guidance on Building elements	[KK169]HIGH STANDARD REQUIRED FOR SEPARATING WALLS
Guidance on Building elements	[KK170]PROVISION MADE FOR OPENINGS
Guidance on Building elements	[KK172]SPECIFIC PRESCRIPTION FOR SEPARATING WALL
Guidance on Building elements	[KK176]GENERAL STANDARD FOR SEPARATING WALLS TO APPLY
Guidance on Building elements	[KK184]SPECIFIC PROTECTION FOR ELEMENTS OF CIRCULATION AND ESCAPE
Guidance on Building elements	[KK196]GENERAL REQUIREMENT FOR ROOFS TO PROVIDE PROTECTION AGAINST FIRE
Guidance on Building elements	[KK200]NEED FOR ACCESS TO ROOF SPACE
Guidance on Building elements	[KK201]ROOF MUST CONTRIBUTE TO SHELTER AGAINST WEATHER.
Guidance on Building elements	[KK207]REQUIREMENT FOR THROUGH VENTILATION ON UNDERSIDE OF FLOOR
Guidance on Building elements	[KK246]A CONCERN FOR THE DESIGN OF STAIRS
Guidance on Building elements	[KK247]CHARACTER OF STAIRS A MATTER OF CONCERN
Guidance on Building elements	[KK248]SPECIFICATION FOR DESIGN OF STAIRS
Guidance on Building elements	[KK250]LENGTH OF FLIGHT OF STAIRS REGULATED
Guidance on Building elements	[KK251]CHARACTER OF STAIRS HIGHLIGHTED.
Guidance on Building elements	[KK252]MINIMUM STANDARDS AND CHARACTER OF STAIRS SPELT OUT.

Guidance on Building elements	[KK253]CHARACTER AND MINIMUM STANDARDS FOR HANDRAILS SPELT OUT
Guidance on Building elements	[KK254]SAFETY ON THE STAIRS
Guidance on Building elements	[KK255]SPECIFIC REQUIREMENT FOR PROVISIONS OF SAFETY ON THE STAIRS
Guidance on Building elements	[KK285]MINIMUM STANDARDS FOR THE OPENABLE ARE OF WINDOW SET
Guidance on Building elements	[KK298]REQUIREMENT FOR CEILING AS DEFAULT POSITION.
Guidance on Aesthetics	[KK116]A CONCERN WITH THE AESTHETICS OF THE FINISHED SURFACE
Guidance on Aesthetics	[KK121]CONCERN WITH THE AESTHETICS OF THE FINISHED PRODUCT
Guidance on Aesthetics	[KK134]CONCERN FOR THE AESTHETICS OF THE FINISHED BOUNDARY WALL
Guidance on Aesthetics	[KK404]COUNCIL CONCERN FOR AESTHETIC QUALITY OF THE CITY
Guidance on adequacy of provision	[KK374]METHOD TO DETERMINE ADEQUACY OF PROVISIONS SPELT OUT.
Guidance of Habitable space	[KK47]SPECIAL CONCERN FOR BUILDING DESIGNED FOR RESIDENTIAL PURPOSE
Guidance of Habitable space	[KK51]SPECIFIC PRESCRIPTION OF DIMENSIONS OF INTERNAL COURTYARD DIMENSIONS
Guidance of Habitable space	[KK180]DISTINCTION MADE IN CASE OF BUILDING FOR HUMAN HABITATION
Guidance of Habitable space	[KK195]SPECIFIC CONCERN FOR HABITABLE SPACES
Guidance of Habitable space	[KK269]THE REFUSE CHUTE MUST NOT COMPROMISE AIR QUALITY
Guidance of Habitable space	[KK284]OPENABLE WINDOW FOR HABITABLE SPACE REQUIRED

Guidance of Habitable space	[KK290]PERMANENT AIR VENTS MAY BE REQUIRED FOR HABITABLE ROOMS
Guidance of Habitable space	[KK304]REQUIREMENT TO SEPARATE GARAGE AND HABITABLE ROOMS
Guidance of Habitable space	[KK326]ISOLATION OF SEWER PIPE FROM HABITABLE SPACE THROUGH A TRAP
Guidance of Habitable space	[KK343]PROTECTION OF HABITABLE SPACE FROM WATER CLOSET
Guidance of Habitable space	[KK359]SUCH FACILITY TO BE PROTECTED FROM HABITABLE ROOMS
Guidance of Habitable space	[KK360]MUST NOT CONTAMINATE EITHER
Guidance of Habitable space	[KK378]MINIMUM DIMENSIONS OF HABITABLE AREA
Guidance of Habitable space	[KK379]MINIMUM PROVISION FOR A DWELLING
Elements that contain fire	[KK214]CONCERN FOR MATERIALS AND ARRANGMENT USED FOR ELEMENTS THAT CONTAIN FIRE
Elements that contain fire	[KK215]SPECIFIC PRESCRIPTION FOR HEARTH
Elements that contain fire	[KK218]STRICTURE TO USE SUITABLE MATERIAL AROUND FIREPLACE
Elements that contain fire	[KK219]DETAILED PRESCRIPTIONS EMPHASING THICKNESS OF WALL AROUND FIRE.
Elements that contain fire	[KK221]STRICTURE ON MATERIAL AND THICKNESS OF MATERIAL FOR CHIMNEY
Elements that contain fire	[KK222]STRICT DETAILS FOR THICKNESS OF CHIMNEY IN SPECIAL CIRCUMSTANCES
Elements that contain fire	[KK223]CHIMNEY MUST BE PROTECTED AGAINST FIRE BY LINING
Elements that contain fire	[KK224]CHIMNEY TO BE PROTECTED AGAINST FIRE BY RENDERING
Elements that contain fire	[KK228]NEED TO CARRY CHIMNEY WELL ABOVE THE ROOF

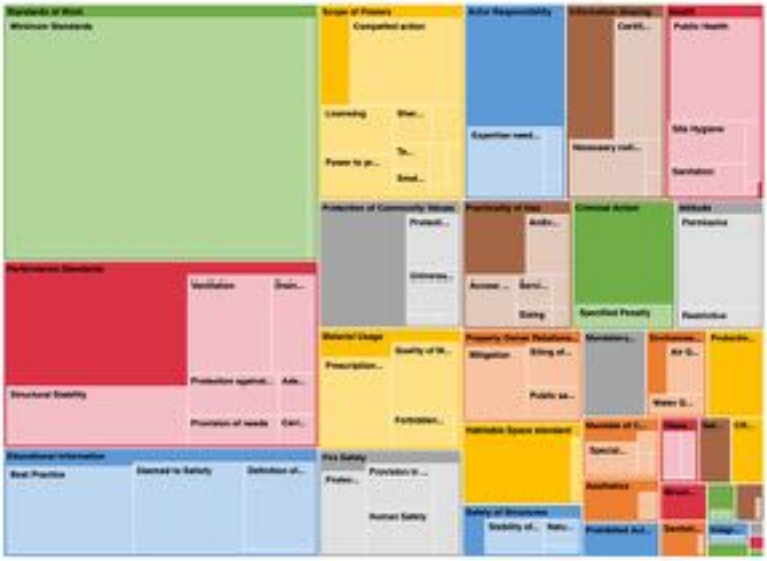
Elements that contain fire	[KK229]CHIMNEY TO BE STRUCTURALLY SECURE
Elements that contain fire	[KK230]PROTECTION OF THE INTEGRITY OF THE CHIMNEY FUNCTION
Elements that contain fire	[KK231]INTEGRITY OF HEARTH FUNCTION TO BE RESPECTED
Elements that contain fire	[KK232]RELIABILITY OF THE HEARTH AND ITS FUNCTION TO BE ASSURED
Elements that contain fire	[KK233]SPECIFIC REQUIREMENTS FOR CHIMNEYS IN PLACES OF WORK (FACTORIES). DETAILS STRICTURES IN BY LAWS 120 TO 123. FOCUS ON INCOMBUSTIBILITY AND STRUCTURAL STABILITY.
Devolution of mandate	[KK240]PROFESSIONAL MAY TAKE RESPONSIBILITY ON BEHALF OF THE COUNCIL
Devolution of mandate	[KK241]HONESTY AND INTEGRITY REQUIRED OF THE INFORMATION SUBMITTED TO THE COUNCIL.
Deemed to Satisfy	[KK191]A DEEMED TO SATISY PROVISION MADE.
Deemed to Satisfy	[KK192]ELABORATE DEEMED TO SATISFY PROVISION FOR FIRE SPREAD
Deemed to Satisfy	[KK198]DEEMED TO SATISFY PROVISION MADE FOR ROOF BUILDING MATERIALS
Deemed to Satisfy	[KK202]DEEMED TO SATISFY PROVISION FOR SHELTER ISSUES
Deemed to Satisfy	[KK205]DEEMED TO SATISFY PROVISION MADE
Deemed to satisfy	[KK275] DEEMED TO SATISFY PROVISIONS FOR WATER STORAGE CONTAINING DETAILS FOR THE DESIGNER
Deemed to Satisfy	[KK341]DEEMED TO SATISFY PROVISION FOR VETILATION OF WATER CLOSET
Critical requirement	[KK62]CONTINUITY OF DRAIN FLOW TO BE MAINTAINED
Criminal action	[KK27]CRIMINALISATION OF FAILURE TO COMPLY.

Criminal action	[KK30]CRIMINALISATION OF UNAPPROVED ACCOMMODATION
Criminal action	[KK33]CRIMINALISATION OF FAILURE TO PROVIDE SANITATION
Criminal action	[KK41]CRIMINALISATION OF FAILURE TO RESTORE NEATNESS
Criminal action	[KK57]CRIMINALISATION OF BREECH OF BUILDING LINE
Criminal action	[KK72]CRIMINALISATION OF BAD MATERIAL SELECTION AND BAD APPLICATION AND WORKMANSHIP
Criminal action	[KK365]AN OFFENCE TO USE UNKNOWN PEOPLE TO CONNECT TO COUNCIL SEWER
Criminal action	[KK405]DISPLAY OF ADVERTISING CRIMINALISED
Criminal action	[KK408]DISPLAY OF POSTER CRIMINALISED
Control of resources	[KK2]USE OF LAND FOR HABITATION
Communication of intention	[KK143]ATTENTION PAID TO POSSIBLE MISINTERPRETATION OF THE REGULATIONS. COUNTER REFERENCED WITH OTHER STANDARDS.
Communication of intention	[KK144]VERY SPECIFIC ATTENTION TO THE MECHANICS OF FIRE TO CREATE COMMON UNDERSTANDING
Banned action	[KK407]DANGEROUS ADVERTISING IDENTIFIED
Actor responsibility	[KK4]DEVELOPERS RESPONSIBILITY TO ABIDE
Actor responsibility	[KK6]FEES PAID TO COUNCIL
Actor responsibility	[KK15]PUNISHABLE ACTIONS
Actor responsibility	[KK114]WARNING ABOUT INTERPRETATION OF THE PRESCRIPTION
Actor responsibility	[KK158]TEST WILL BE REQUIRED FOR FIRE RESISTANCE STANDARD
Actor responsibility	[KK173]CONTINUITY OF PROTECTION TO BE ASSURED

Actor responsibility	[KK234]REQUIREMENT FOR QUALIFIED PERSONNEL TO BE INVOLVED IN THE DESIGN AND SUPERVISION OF MOST BUILDINGS
Actor responsibility	[KK235]THE ARCHITECT TO TAKE RESPONSIBIITY FOR THE RECORD OVER DESIGN
Actor responsibility	[KK236]REQUIREMENT FOR QUALIFIED STAFF TO BE ON SITE ALL THE TIME.
Actor responsibility	[KK237]STATEMENT OF BUILDINGS REQUIRING QUALIFIED STAFF. **(QUESTION ARISES ON OTHER BUILDINGS ESPECIALLY IN URBAN AREA)**
Actor responsibility	[KK239]PROFESSIONALLY QUALIFIED PERSON TO TAKE RESPONSIBILITY ON THE RECORD
Actor responsibility	[KK244]REQUIREMENT FOR QUALIFIED SUPERVISOR FOR STRUCTURAL WORKS ON SITE
Actor responsibility	[KK280]PLUMBING EXPERTISE TO BE APPLIED BY TRAINED PERSONNEL
Action outside mandate	[KK26]ACCEPTANCE OF BELOW MINIMUM STANDARD ON OCCASION.
Accommodation of creativity	[KK291]INDICATION THAT CREATIVE SOLUTIONS ARE PERMITTED BY THE REGULATIONS
	[KK18]
	[KK60]
	[KK137]A PARTICULAR SOLUTION TIED TO BROADER STATEMENT
	[KK138]DEEMED TO SATISFY PROVISION TYING TO GENERAL STRICTURE

Appendix 2: *CLAUSE CLASSIFICATION INTO CODES*

APPENDIX 3 VISUALISATION OF THE ADOPTED CODES


Standards of Work
Minimum Standards
Performance Standards
Ventilation
Drain...
Protection against...
Ade...
Structural Stability
Provision of needs
Cert...
Educational Information
Best Practice
Deemed to Satisfy
Definition of...
Scope of Powers
Competent person
Licensing
Shel...
Power to pr...
To...
Enad...
Protection of Community Values
Protecti...
Conserva...
Material Usage
Quality of M...
Prescription...
Forbidden...
Fire Safety
Fireles...
Provision in ...
Human Safety
Actor Responsibility
Expertise need...
Prioritisation of Risk
Acces ...
Sanct...
Sizing
Property Owner Relations...
Mitigation
Siting of...
Public se...
Australian Space standard
Safety of Structures
Stability of...
Natu...
Information Display
Certif...
Necessary cert...
Health
Public Health
Site Hygiene
Sanitation
Criminal Action
Specified Penalty
Attitude
Permissive
Restrictive
Monetary...
Environmen...
Air Q...
Water Q...
Protectio...
Municipal or C...
Special...
Aesthetics
Waste...
Deemed...
Drainage...