

**VARIATIONS IN URBAN LAND DELIVERY MODELS AND THEIR IMPLICATION
ON THE PROVISION OF INFRASTRUCTURE: A CASE OF KITENGELA,
KAJIADO COUNTY, KENYA**

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BY

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ABSTRACT

Urban areas emerge from various models in which land is availed. This study is driven by interest that arises from the fact that various studies and literature shows that pre-planned land delivery models incorporate social and physical infrastructure provision. On the other hand, studies done in Kitengela indicate deficiencies in the provision of social and physical infrastructure despite the town's conception being associated with planning (the first plan of Kitengela prepared in 1975). On this premise, curiosity arises on the basis that if planning led the land delivery for the development of Kitengela then infrastructure should be adequately in place. Therefore, the study seeks to answer the question, "How do the various urban land delivery models impact the provision of social and physical infrastructure?" The study hypothesis is that "deficiency in access to public social and physical infrastructure in an urban area could mean that the predominant urban land delivery model is unplanned (*laissez-faire* or market-driven)." Every day governments and authorities initiate projects to augment infrastructure in urban areas. However, the deficiency in infrastructure persists with the growth of urban areas. This study, therefore, tries to bridge the knowledge gap on optimization of infrastructure in urban areas as far as the land delivery models are concerned. This study adopts comparative analysis with qualitative and quantitative approaches with Chi square as a statistical test to test the study hypothesis. The key finding leads to the rejection of the study hypothesis to prove that deficiency in social and physical infrastructure in an urban area could mean that the predominant urban land delivery model is unplanned (*laissez-faire* or market-driven). The implication of this finding shows that if urban land delivery model is not preplanned then there are zero chances of optimizing provision of social and physical infrastructure in urban areas.

DECLARATION

This Research Project is my original work and has not been presented for a degree in any other university.

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This Research Project has been submitted for examination with my approval as University supervisor.

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DEDICATION

To my father, Mr. Booker Washington Achieng', mother, Silpa Achieng' and the scholars who would want to use the knowledge generated from this study.

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ACRONYMS

BO	Build and Occupy
CBD	Central Business District
DLPP& UD	Department of Lands Physical Planning and Urban Development
DRC	Danish Refugee Council
EPZ	Export Processing Zone
KPHC	Kenya Population and Housing Census
KNBS	Kenya National Bureau of Statistics
LR	Land Readjustment
NACOSTI	National Commission for Science Technology and Innovation
NACHU	National Cooperative Housing Union
NLC	National Land Commission
PLUPA	Physical and Land Use Planning Act
PSBO	Plan Service Build and Occupy
SDGs	Sustainable Development Goals
SACCOs	Savings and Credit Cooperatives
SPSS	Statistical Package for Social Science
TP	Town Planning
UN-DESA	United Nations Department of Economics and Social Affairs
UN-HABITAT	United Nations Human Settlements Programme
UNHCR	United Nations High Commissioner for Refugees

1. CHAPTER ONE- INTRODUCTION

1.1 Background

The history of human civilization in the field of Planning is more often conceived in settlements. Leadership and governance are mainly mentioned in spaces where there is an agglomeration of people and activities (urban areas). The historical evolution of civilization is based on how urbanization has evolved from the pre-historical time to the post and new modernism stage. Every stage justifies the advancement in creativity and the desire to make urban places better as urban areas' complexity increases (Gallion, 1950). With the evolution and expansion of urban areas, more land is delivered for urban land use. In this submission, urbanization proves unrelenting. To justify the preceding statement, the United Nations Department of Economic and Social Affairs (UN-DESA) established that “the proportion of the world population living in urban areas rose from about 30% in 1950 to 54% in 2015 and is projected to rise to 66% by 2050” (UN-DESA 2014).

Similarly, Africa is in the lead with reference to rate at which its population is changing. It is also projected that the urban population will rise to sixty percent (60%) by 2050 (Teye, 2018). The urbanization phenomenon put it in the interest of planners and leadership to be concerned with the systems that deliver land for urban development while ensuring that the urban environment meets the urban residents' social needs by providing social and physical infrastructure.

As urban places grow, needs for social and physical infrastructure grows. Planning in practice and as an activity is about property development and land use. It is the struggle to balance social, economic, environmental, and political interests that never reach a balance as influenced by human population dynamics and the market forces. Planning comes in to allocate resources where economic forces have failed to take care of the public's interest (Healey, 1983). Public interest has been an integral part of planning from the history and origin of planning. The concerns of public interest are seen in visionary leaders' work and the founding fathers of the formal planning profession and practice like Ebenezer Howard, Patrick Geddes, among others in the Rational Comprehensive Planning era (Mäntysalo, 2004). In this era, the planner was recognized to be acting in the public interest, considering all the possible options available to make decisions (Elliott, 2014). Alexander (1992) concurs with the ideology that “public interest as a foundation of the rational planning approach and as the traditional model of comprehensive planning. Previous studies have shown that there is a direct relationship between Planning and the provision of infrastructure. Gallion (1950) underscore the inseparable act of developing cities and provision of infrastructure that begun in the ancient period of urbanization. He (Gallion, 1950) state that few cities in the ancient period where culture thrived begun with a plan. However, it is not always the case that when land is delivered for urban development, social and physical infrastructure is part.

Literature shows that a pre-planned model of delivering land for urban development ensures that servicing the land i.e., provision of social and physical infrastructure must always be part of developing the urban areas. Ayonga (2019) gives the stages in the formal and pre-planned land delivery models that confirm the premise that creation of towns must include planning, provision of services, obtaining a permit to build, and issuance of a certificate of occupation for one to occupy the developments. Previous

studies that have been done have revealed that informal urban land delivery has resulted in informality in human settlement. In this context, the informality lacks compliance with the planning standards, regulations, and norms (Agheyisi, 2018), including the lack of social and physical infrastructure. Despite the negatives, studies have shown that informal urban land delivery model at the periphery of urban areas have made land accessible to the urban poor (Musyoka, 2004; Durand-Lasseve, 2004). The dilemma of public interest arrives at a crossroads since planning is done in the public's interest. Simultaneously, the formal models hinder certain social groups from accessing some social rights realized through the land in urban areas.

The influence of various models within which land is being availed for urban development is both negative and positive depending on the degree to which social and physical infrastructure is part. Land development regulations on subdivision and building have been criticized for being rigid and hindering development in African countries (Agheyisi, 2018), which has led to modification and violation of the regulations and norms, consequently hindering the effectiveness in the provision of infrastructure. On this backdrop, this study set out to examine how land delivery models (pathways) influence the provision of infrastructure. The study focuses on the case of Kitengela urban area in Kenya.

1.2 Problem Statement

Although studies show that indifferent land delivery models variedly influence the provision of physical and social infrastructure, how this phenomenon takes place is not established yet. This knowledge gap is even more urgently required in a country like Kenya with multiple land delivery models. How such development pathways help to deliver or fail to deliver physical and social infrastructure is critical as urbanization continues.

Literature has shown that pre-planned land delivery models incorporate social and physical infrastructure provision (Colony and Protectorate of Kenya, 1931). On the other hand, literature about Kitengela indicates deficiencies in providing social and physical infrastructure despite the town's conception being associated with planning in the initial stages. A study conducted by Ibrahim (2017) found out that the provision of waste management infrastructure is not commensurate to the population in Kitengela hence the inefficiency and deficiency in solid waste management. Additionally, the deficiency in the provision of social and physical infrastructure in Kitengela is presented by the study conducted by United Nations High Commissioner for Refugees (UNHCR) and the Danish Refugee Council (DRC) in Kitengela in the year 2012, describes the deficiencies in social and physical infrastructure and attributes it to the rising population (UNHCR and DRC, 2012).

Kitengela urban area depicts various models within which land- that is currently urban- has been availed for urban development. Noonkopir area was the first area to develop into an urban area under the local government delivery model. The opportunity that emerged with the urbanization in Noonkopir, the neighboring agricultural land was also delivered for urban development. This model is attributed to the land control board and the local authority. The land control board pathway also presents some sub-models depending on the development proponents. There were cooperatives, SACCOs, companies, and individuals who bought land and sought approval through consent issued

by the land control board and the local authorities that controlled agricultural land development in those days. All the above-identified models draw legality from statutes that governed land delivery and development. These statutes include repealed Town Planning Act Cap 134, Land Planning Act, 1968, Land Control Act, Cap 302, Local Government Act Cap 265, Repealed Government Land Act Cap 280, Land Act, 2012, and Physical Planning Act Cap 286. On this premise, there is the expectation that if planning led the land delivery for the development of Kitengela then infrastructure should be adequately in place. This problem context begs the question, “How do the variations in land delivery models impact the provision of social and physical infrastructure.” Deducing from literature, various scholars' positions and viewpoints attempt to provide responses to this discourse's concern in various perspectives.

Baros (1987) presents the various steps in urban land delivery to include the logical stages of plan, service, build and occupy. The development model is articulated by Bhan (2016) to present a strict planning control of development. After the great London fire in 1666, the European models of urban land delivery reinforced by the challenges of the industrial revolution established a paradigm shift in the models of urban land delivery. The model mainly focussed on the planning the land before allocation of land for other uses. The local authorities had to anticipate the future growth prospects and directions, set aside land, and prepare a scheme plan for the area before allowing people to occupy that particular land (Booth, 2003). Intensified campaigns to address the social vices of the organic or informal land delivery models began in the industrial revolution. During this period, various pioneers of planning practice outlined clear procedures of establishing urban areas with planning being the framework within which land was allocated with social and physical infrastructure incorporated.

The urban land delivery models in Kenya also present the duality of preplanned and organic models of urban land delivery. In Kenya, urban development land occurs through various models that include the local authorities (now Counties Governments) through the powers bestowed in them by the Local Government (Revised) Act Cap 265 (Government of Kenya, 2010). The delivery of land is also through physical planning processes that allocate land for various uses, mainly in areas prepared for urban development (Government of Kenya, 1996). Land for urban development has also been delivered through informal processes. The informal processes are whereby agricultural land is converted for urban uses, which Rakodi, Leduka, and Musyoka (2004) refer to as formal or informal land delivery processes depending on the procedures followed in the delivery of the land for urban functions (Leduka, 2004; Rakodi and Leduka, 2004; Musyoka, 2004). The findings of Leduka, Rakodi, and Musyoka base the formality and informality in the procedural aspects of land use conversion and do not relate the implication of such phenomenon on the provision of infrastructural (physical and social) services.

Kitengela urban area presents multiple models of urban land delivery. The town began to grow on land that was formally set aside for urban development, and the authorities did land-use allocation before people were allowed to settle on site. The model under the local authority should be a formal development model. With the development processes beginning under the watch and care of the authorities responsible for guiding development in Kitengela, infrastructural service provision has been a challenge. Additionally, the agricultural land transformation to urban land use has occurred under

the local authority's approval and the Land Control Board's consent. This delivery model's proponents are the individual residents, cooperative societies, and various institutions and organizations that are non-governmental.

Within these established models, social and physical infrastructure provision shows deficiencies based on the standards and norms. Therefore, this study seeks to establish how the variations in the various land delivery models impact provisions of urban social and physical infrastructure by validating the premise that when land delivery models are driven by planning, then social and physical infrastructure is always optimized.

1.3 Research questions

This study seeks to respond to the following questions.

- i. How does the preplanned land delivery model optimize the provision of social and physical infrastructure?
- ii. How have the land delivery models in Kitengela influenced the provision of social and physical infrastructure?
- iii. How do residents in Kitengela cope with the deficiencies in the provision of social and physical infrastructure?
- iv. What opportunities exist for the retrospective provision of social and physical infrastructure?

1.4 Research Objectives

This study seeks to achieve the following objectives:

- i. Establish how preplanned land delivery models optimize the provision of social and physical infrastructure.
- ii. Find out how various land delivery models have contributed to the provision of social and physical infrastructure in Kitengela.
- iii. Investigate how residents in Kitengela cope with the deficiencies in the provision of social and physical infrastructure.
- iv. Identify the opportunities that exist for the retroactive provision of social and physical infrastructure.

1.5 Research Hypothesis

H_0 = Deficiency in social and physical infrastructure in an urban area does not mean that the predominant urban land delivery model is unplanned (*laissez-faire* or market-driven).

H_1 = Deficiency in social and physical infrastructure in an urban area could mean that the predominant urban land delivery model is unplanned (*laissez-faire* or market-driven).

The hypothesis in this study was tested using chi-square statistical test to accept or reject the null hypothesis.

1.6 Scope of the Study

The technical scope and the geographical scope of this study are as follows.

1.6.1 Theoretical Scope

This study intended to investigate the various land delivery models, including the ideal models of land delivery where infrastructure is part, and to investigate the land delivery models in Kitengela to establish the impact on infrastructure.

1.6.2 Geographical Scope

The study is limited to the core urban area of Kitengela and the neighboring residential areas.

1.7 Justification

Urban social and physical infrastructure provision is an inherent challenge. It is a challenge that is experienced in both formally planned urban areas and those that have developed informally. The problem is not likely to end any time soon as long as the status quo continues. Understanding the concept of land supply for urban development is necessary to establish the relationship between urban land supply and infrastructure provision. Within this investigation, developers can establish the disconnect between the optimization of urban social and physical infrastructure and land delivery. Therefore, this study is crucial, as it will add to knowledge the relationship between urban land delivery models and their influence on the provision of social and physical infrastructure.

Governments are making efforts to improve social and physical infrastructure, but the deficiencies persist. The knowledge and information gathered in this study can inform policy on land delivery for urbanization and infrastructure provision.

1.8 Definition of Terms

Urban Land Delivery models- The approach/ development pathway that is followed to avail land for urban development.

Infrastructure- facilities in physical state that are required by to operate. In the United Kingdom (UK), 'National Infrastructure' is described as 'the foundation for economic productivity and human wellbeing' (Hall *et al.*, 2012). It provides the energy and water resources that society needs to function, and enable people, information, and goods to move efficiently and safely (Williams, 2014).

Development Control- Development control is ensuring the "right" (planned) development either by private entrepreneurs or public agencies, as well as prevention of carrying out "wrong" (unplanned) development. Development control is the legal control of the use of urban land applied in the context of plan formulation, implementation, and temporal development of a planned system

Public Interest- the environmental, economic, and social priorities that serves the well-being of the community and interests that are extended to endemic diversity.

Social Welfare- the group of assistance actions designed to ensure the wellbeing of the people citizens.

Pre-planned Delivery - planned before development of the built form.

Informal Land Delivery – Availing land for urban development without formal planning undertakings.

Infrastructure- Both the facility and the service it provides.

Land Subdivision- According to the Physical Planning (Subdivision) Regulations of 1998, is "the division of a lot, tract, or parcel of land into two or more lots, plots, sites, or

other divisions of land for the purpose, whether immediate or future, of sale or building development (Government of Kenya, 1998).

Local Authorities- administrative bodies in local government or a county government.

Human Civilization- Evolution in human activities

Conversion of use – change of use from agricultural to urban use.

Urban Land- Land for urban development.

1.9 Organization of the Report

This report is organized into six chapters. Chapter one presents the background and introduction of this study. Chapter two presents the review of literature that culminates in a conceptual framework. Chapter three relates the methodology adopted in undertaking this study. Chapter four presents the area's physiographic and socio-economic characteristics, while chapter five presents the study's analysis and findings. Finally, chapter six summarizes the findings and presents the conclusion arrived at in this study. The last chapter also presents the recommendations made under this study.

2. CHAPTER TWO - LITERATURE REVIEW

2.1 Introduction

This chapter relates systematic examination of documents and related information on urban land delivery models and how the various models influences the provision of social and physical infrastructure. The chapter explores how the land has been availed for urban development in the European, North America and African-British system. The goal in exploring the delivery models is to establish how infrastructural provision is made. In addition, the exploration seeks to establish the ideal urban land delivery model where the infrastructural provision is incorporated. Further, the review brings forth the interventions that have been applied and adapted for adequate infrastructural provision in areas where the ideal land delivery models were not applied. Finally, the review of literature culminates into a conceptual framework of this study.

2.2 Theoretical basis of this research

The theoretical postulations that inform this study are four. These theories include incrementalism, normative, procedural, and rational comprehensive planning theories.

Normative planning theory, justifies planning as an activity and as professional practice. It (normative) looks into how planning ought to be done (Allmendinger, 2002). In this context, normative theory justifies planning role in delivering land for urban development. It justifies the norms and the standards which planning practice conforms to in fulfilling the social objectives that planning seeks to achieve (Scott, 1971). In this particular study, the social objectives include availing social and physical infrastructure. From the forgoing discussion, a concurrence is arrived as with the view point of Hall (2014) that states, “Planning practice was created to ameliorate the public interest.”

Procedural theories of planning on the other hand, seeks to explain the series of actions that planning activity follows to achieve its objectives (Faludi, 1973, Mario, 2010). Procedure as a methodology becomes critical in interrogation the development pathways that are followed to create an urban area with optimal provision of infrastructure.

Rational Comprehensive Planning Theory (Synoptic) as reviewed in this study explains the context in which urban areas are conceived in a preplanned development model (Hudson, 1979). The synoptic theoretical backing in this study underscores the key theoretical consideration that includes the comprehensiveness of the planning approach that constitutes the rational thought of the expert; the consideration of all the available knowledge and the fact that the planner acts on the public interest while preparing a plan which in the context of this study, delivers land for urban functions.

Finally, Incrementalism, as put forth by Lindbloom (1959), is the third approach to making policy decisions. It is a deviation from comprehensive view of solving problems but taking those policy options that can be achieved progressively. In similar context, delivery of land and provision of infrastructure have the possibility of taking place in that similar manner. Based on this theoretical perspective, the interaction between land delivery and infrastructure provision have varried outcomes that this study seeks to reveal.

2.3 Role of Planning in Urban Land Delivery

Planning practice and as the activity is about property development and land use organization. It struggles to balance the social, economic, environmental, and political interests that never reach a balance as influenced by human population dynamics.

Planning comes in to allocate resources where economic forces have failed to take care of the public's interest (Healey, 1983). For example, the literature on the informal development of urban areas, as presented later in this work, presents the market forces' failure in providing infrastructure to the public according to the planning standards. Therefore, planning precedes development to allocate land for various uses to serve the public interest and create social welfare. Public interest has been an integral part of the planning from the history of planning as was championed by visionary founders like Ebenezer Howard, Patrick Geddes, among others in the Rational Comprehensive Planning era (Mäntysalo, 2004). In the Rational Comprehensive era, the planner was recognized to be acting in the public interest, having considered all the possible options available to make decisions (Elliott, 2014). Alexander (1992) concurs with the ideology that “public interest as a foundation of the rational planning approach and as the traditional model of comprehensive Planning” (Alexander, 2002). Planning especially serves the public interest by addressing their concerns on space and in advance.

Healey (1983) argues, “Government intervention through Planning is in the interest of the public.” He further argues that public interest, as viewed by planners, is serving the serving of community interest, meeting social needs that unfettered market does not (Healey, 1983). Moroni (2004) made the argument that “public interest can be recognized during the planning process since it serves as a condition in the appraisal of alternative planning proposals” (Moroni, 2004). Besides, Davidoff (1965) agrees by stating, “The planning process should be built up and practiced with consideration to the plurality of the public” (Davidoff, 1965). Planning is, therefore, necessary in the ideal model of urban land delivery. Planning is undertaken to prepare the land for the urbanization process that is already foreseen. The meticulous calculation of land requirements and projections is done to address the needs of the population anticipated on-site. This is how infrastructure provision is optimized in a preplanned model.

McAuslan (1980) has championed three ideologies as regards public interest. The first ideology is the private interest that is protected by law. The second ideology is the public interest that is protected and championed by the planners through planning and implementation of development control to address the social good of the society. The third and final is the public participation that shapes the policies such as plans that endeavors to serve their vision (McAuslan, 1980). Colic (2017) puts forth that “the previous two dimensions of planning practice related to the expropriation of land and the provision of public land-use and public services can be seen as normative articulations of the public interest.” Similarly, Habermas (1989) deduced that the organization of ancient cities of Greeks and Romans acted a spatial expression of ideas that free citizens should engage in public life-promoting forms of collective interest (Habermas, 1989). In his wisdom, Aristotel identifies public interest as shared by members of the community (Tati, 2016). The notion that public interest is a matter that affects more than one interest has also been backed by Dewey (1954). He is concurring with the position in this discourse that something only becomes public when its consequence spillover from only affecting the parties directly involved in the decision (Tati, 2016). If that is the case, as put forward by various scholars, it begs the question, “What constitutes the public interest in planning?”

2.3.1 Concept of Public Interest

Various scholars have defined and outlined elements of public interest. Planning is viewed as the only vehicle that the authorities can use to champion public interest. Chapin and Keiser (1979) describe public interest as those things that the courts will suction as a public purpose. In land-use planning context, public interest is identified as those built on the legal test and are looking forward to addressing social issues. According to Chapin and Keiser (1979), the elements of public interest are “health, safety, convenience, efficiency, energy conservation, environmental quality, social equity, social choice, and amenity.” In unpacking these elements, Specific indicators that can be regulated are described. In this study, the indicators of public interests, which are physical and social infrastructure-related such as water and sanitation, circulation and land for streets, open spaces (fire assembly points) schools, are examined to establish the extent to which various land delivery models have championed public interest. On this basis, the level to which the various land delivery models achieve public interest is measured based on the weighted score on the various selected indicators of public interest as identified by Chapin and Keiser (1979). The weighting criteria is further explained in the methodology chapter.

Campbell and Marshall's standpoint is that Planning does not have any values without substantial content (Campbel and Marshall, 2002). However, viewed in the positive dimension, Davidoff (1965) says that “the convincing need for planning and requirement for new social determinations will drive the city planners to confer shape and content to the public interest” It is also viewed that the government's intervention to champion public interest also leads to economic development. Public interest encapsulates numerous aspects that contribute to livability in man’s environment. The content of public interest as can be derived from the Town Planning Act of 1947 include, “provision of new housing, healthcare services, the development and reconstruction of the towns, raising employment possibilities and community services, designation of new parks” (Cullingworth and Nadin, 2002 in Nagy, 2015). The list is inexhaustive, but it is worth mentioning that public interest contains those aspects of development that meet collective social needs. The needs are not only limited to services but also the amenities within reasonable standards. This is indeed what planning seeks to achieve. Fogarty (1948) agrees with this argument from his writing on town planning by stating that planning equips communities with the means that they need to satisfy their social life (Fograty, 1948). Public interest has also been conceptualized as in the theory of welfare economics as the well-being of society’s individuals (McAllister, 1980). It is equated to the weighted sum of utilities of all individuals in a society.

2.4 Urban Land Delivery Models

Land delivery models in this study is not only construed as the manner in which land is availed for urban development but also in the perspective of the development pathways that qualify a given development in urban area as formal or informal. The second perspective calls for the general understanding of development in the context urban planning. Development has been defined as “the carrying out of building, engineering, mining, or other operations in, on over or under land or the making of any material change in the use of building or other land.” (Loughin, 1973; Governement of United Kingdom, 1947; Cullingworth, 1989). Curlingworth (1989) goes ahead to describe the making of material change in the use of a building or land as undefined in the legal definition in the United Kingdom.

In Kenya, development is defined as “carrying out any works on land or making any material change in the use or density of any structures on the land or subdivision of land (Government of Kenya, 1998; Government of Kenya, 2019). Further, to address the limitations in the definition as was borrowed from the Town and Country Planning Act of 1947 is pronounced to be unclear by Cullingworth (1989), the Kenyan legal definition extended the definition to include change in density and to include deposition of refuse, scrap, waste, or any material to constitute development (Government of Kenya, 1996). With this understanding, the scope of urban land delivery models constitutes the development pathways in which urban land was set aside and availed/released for development to the extent to which infrastructure was put up among other developments that constitute urban.

Urban development is a continuous process that is just as unstoppable as population growth. Within the urban areas, activities such as administration, appreciation of culture and art, trade, finance, and agglomeration of activities occur. Cities, further, served as a defensive base for communities where they could attack and subdue the remaining land for purposes of drawing livelihood (Hoyt, 1962). Meyer (2000) argued that “A site’s defensibility or its capabilities for imposing military or administrative control over surrounding countryside were often of paramount importance.” Therefore, it was a deliberate decision of the leadership (princes, kings, generals, bishops, military leaders and other political) (Meyer, 2000) of society to determine the suitable site for urban development.

Activities that define urban phenomenon grow continuously and require land space to be undertaken, and so is the need for land for urban activities. This background then leads to the question, “What are the various land delivery models that supply land for urban development?” In this dissertation’s context, the urban land delivery model is conceptually defined as how land is being set aside and supplied or availed for urban development. The models of land delivery define development trajectories or path ways which impact the provision of social and physical infrastructure in varied proportions. This study strives to trace the pathways from the available data on urban development from the neolithic period to date (Modernism age).

Civilization of man begun from the period that man resided in caves with no permanent place of residence. Gallion (1950) states that man moved from caves to villages and slowly developed a social system that gave birth to urbanization within those transitions. The chronological history of urban development in the earliest stages also described as the New Stone Age (*Neolithic* period) shows that, the aspect of living in settlements was brought about by the transition from hunting and gathering to crop cultivation (agriculture) which necessitated human to adapt to a sedentary lifestyle (Lewin, 2009). Increased production in agriculture required secured space for storage and further exchange of the surplus. The increasing productivity also brought about changes in social order. Communalism slowly started diminishing while individual ownership and accumulation of wealth emerged (Redman, 1978). Increasing production also brought with it the concept of private property (Elmqvist et al., 2013). Apart from change in property ownership, various changes in social order gradually emerged constituting social hierarchy and stratification. The transformation was associated with the ability to convert surplus into prestigious goods that are associated with status and power (Elmqvist *et al.*, 2013). This social stratification entailed the elite groups, and landlords.

Elmqvist *et al.*, (2013) explains that the changing social order required legitimacy through various ideology such as religion, law, myth or in constructed history. On this account, Meyers'(2000) statement hold true that princes, kings, generals, bishops, military leaders and other political were the vision carriers and the people determining where urban areas could be established. These leadership posts emerged from the new social order that rose from the Neolithinc period of human civilization.

The emerging sedentary way of life necessitated that the settlements would perform various functions. Having served as areas for refuge and storage, these areas also started performing both economic and political functions based on the new social orders that emerged (Adams, 1966; Fernandez-Gotz, 2018; Pounds, 2005). The social systems, therefore, guided the operations and organization of activities and people in urban areas. It is also true that the organization of activities and town henceforth became a political process driven by interest.

This transformation did not stop by one society; it was a continuous process across areas that experienced the same civilization. Rural-urban migration begun and urban areas became magnets based on what they could offer. Since a given class of people now guided the urban settlements, it meant that not all people who were migrants could be accommodated in the urban areas, which were fortified or strategically located at higher grounds to offer safety and security (Hoyt, 1962; Meyer, 2000; Elmqvist *et al.*, 2013). The identified areas were well organized based on a forethought which would fulfill the definition of the stem word “planning” as used in the field of urban and regional planning. These urban areas were organized in the interest of the leadership after which the land within the confines of the defined urban area was allocated by the above-mentioned leadership. Of course, the allocations were based on interest since they were the property owners and the owners of productive resources in urban areas. Those who were not absorbed in the city/established urban places agglomerated outside the city walls and created urban like places without prior organization of the space.

Similarly, in the next period of civilization, (the iron age in Europe) similar development trajectory is observable with slight variations. The agglomeration continued in fortified urban areas with suburbanization taking place at the same time. When the population overgrew the established urban places, they resided outside the walls (Fernandez-Gotz, 2018). Within the Iron Age city, the social changes also created the political, military, and religious leadership to guide development in urban area based on the customary social system that emerged from these periods. It is also established that there was a conscious organization of space in these urban areas as was informed by geometry (Fernandez-Gotz, 2018). In this age, the planning of the urban places considered connectivity that was articulated in the road network system, building line, density, public places like the markets and open places (Fernandez-Gotz, 2018). Further, distinct zones and neighbourhoods are traced to the Iron Age urban places (Smith, 2010; Fletcher, 2012). As production continued to result in surplus, huge agglomerations were experienced; Fernandez-Gotz (2018) explains that people could now agglomerate in open fields with huge specialization and division of labour taking place within the urban area in the late iron age. Observably, both scenarios or development trajactories brings into picture duality in urban development. Those that emerge within the new social order and those that emerge organically outside the fortified urban places. As put forth in urban economics perspective amenities that the fortified urban places offered were pull

factor for population (Rosen, 1979; Roback, 1982; Duranton and Puga, 2013). However, there are thresholds within which the amenities can be enjoyed. Beyond which people will feel uncomfortable and move out of the urban areas (Duranton and Puga, 2013). Similarly, when the population overstretched in the iron age urban places they moved and agglomerated in open fields without planning the land in advance. The development was organic.

In the classical urban area /cities, the development trajectory was owed to the foundations laid by the predecessors. The identification of suitable land was borne to the political, military, and religious leadership. In Greece and Rome, the development pathways were similar and the substance of planning were nearly the same. Concerns of urban places were security, connectivity, and economic development among other amenities. According to Pounds (2005) it was a general rule that the towns had to be carefully planned, informed by geometry, the streets were straight with intersections at right angle. Spaces were left for public facilities such as basilicas, temples, large meeting halls and generally large area for public gatherings like the central squares (the *agora* and the *fora* in Greek and Roman civilizations respectively) (Pounds, 2005). Infrastructure was part of these towns that were created under the social systems and leaderships. Despite the variable were limited to roads, water, religious places, public spaces that, in the medieval age was a symbol of prowess (Pounds, 2005). It is worth mentioning that urban places slowly became institutions (Pounds, 2005).

Key advancements in the classical urban areas were two. The first one was the institutionalization of urban area. Urban areas/cities purely become institutions that had self-governance and self-sufficiency and their development decided within an institutional framework. According to Pounds (2005), “the urban areas had their matters resolved in their own courts and not under the feudal system in the rural areas.” At this point, there is formality in organization of activities in urban places.

Secondly, the urban areas controls were established and provision of services was part of the concerned of the urban institutions. As mentioned earlier in the previous paragraph of this discourse.

The mediaeval urban areas present a one-path development trajectory. According to Pounds (2005), the medieval towns were “deliberately and consciously created by territorial lords with the primary objective of making profit. In this development pathway, Pounds (2005) describe the process of these towns, which he calls planted towns. He says:

“Sufficient land would be set aside for a town, and in some instances, streets were even planned and “burgage” or building plots delimited for the anticipated settlers... And so, plots were taken up and an urban community gradually took shape.”

Lords, who were the vision carriers and the proponents of development, strategically identified suitable sites, which were near a permanent water source. They then provided infrastructure that included market to attract people, and streets for movement. These infrastructures were not provided in the interest of the public but to facilitate their objective that was profit motive. The difference in this civilization age was that, these were planned new towns. However, the plans were limited to the target of the lords and not the future growth perspective and opportunities to retain the quality of life that acted as a magnet at the conception.

Due to lack of futuristic considerations on the growth of the medieval towns, the dualism reemerged when these towns were fully occupied. Development bypassed the walls and the organic development trajectory started rooting outside the walls of the urban areas (Pounds, 2005). There was constant rise in the population, which was not commensurate to the augmentation of infrastructure (Blockmans, 2012). This phenomenon, therefore, compromised the amenity of the urban place in the mediaeval period.

Renaissance as awakening period in history of civilization was driven by four factors. The first factor was the modernization of warfare and the rise of the nation-state. The second factor was the colonial exploration, exploitation, and expanding networks of trade. The third factor was the Dangers posed by rapid urbanization. Finally, political, and geographical divisions within Christianity (Wyly, 2012). Key to this study is the impact of the renaissance on land delivery and infrastructure provision. Of course, the renaissance resulted in the creation of new urban area as much as it led to the rethinking the development models in the classical and mediaeval periods (Akkerman, 2001). Akkerman, (2001) gave a documatation of of how the phylosophical, mathematical and scientific thoughts of René Descartes influenced the development of new towns which were informed by a concious and deliberate thought to organizing activities on a virgin land. Key components of thes new towns were, good layouts and grand public spaces (Akkerman, 2001). As put forth by Wyly (2012) the security role of the walled urban areas or those developed on hills was compromised by the invasion of gunpowder in this period.

On the dangers of urban growth, public interventions on welfare were justified in the experiences of fire, and plague that affected all classes of the society. They were concerns on construction, sanitation, and other facets of urban life (Samuel and Cohn, 1992; Hall, 1998).

Catastrophic incidences resulted in decisions that still inform planning laws to present day including shaping the urban landscapes (Wyly, 2012). It is because of the disasters (including the great London fire in 1666) that King Charles II King passed mandates on building methods and materials; streets widening to enhance safety, establishment of fire breaks prohibition of unauthorized constructions. All the above-mentioned factors gave rise to government providing regulations, the eminent domain giving the government powers to acquire land compulsorily for public interest and compensation of the private property owners in case of acquisition (Booth, 1996; Wyly, 2012). Infrastructure was, therefore, key for safety and wellbeing of the people.

The next civilization was the industrial revolution. The industrial cities were centers of production, distribution, and consumption led by machine (Gallion, 1950). Industrialization as an advancement in the production system and civilization of man occurred in the cities with were already in existence. New advancements in engine driven machines increased production as well as the population. Of course, capitalism was the new social order as the owners of factors of production were able to produce more with the advent of automation (Gallion, 1950). Consequently, industrial cities became magnets and attracted labour for the rural areas. There was a population surge in an urban area with a constant infrastructure provision and a lack of planning for the swelling population. The demand for land for urban development would not match formal land delivery (Wrigley and Schofiel, 1981: Gallion, 1950). As the economic theories of demand and supply postulate, when the demand is higher and the supply

systems are not effective, an opportunity will be definite. Land at the edge of the cities started being converted for residential. It was profitable to provide accommodation within and around the cities (Gallion, 1950). The people could build around the cities, and people occupy. There was no consideration of planning standards and infrastructure provision as these areas transform into urban.

The negligence of orderliness, quality of the living environment, and public health led to the emergence of social ills and epidemics that led to massive deaths in the industrial towns (Bruton, 1984). As a natural ability of man to reflect and the survival instinct kicking in, concerns rose on the town's social welfare. The rational town as a going concern to correct the mess of the industrial revolution can be traced from this point (Gallion, 1950; Bruton, 1984; Hall, 1992; Booth, 2003). This phenomenon was a wakeup call that led to the emergence of public health and proper town planning. Whose forces were mainly based on a deliberate and well thought out organization of land for various activities within urban areas.

In the United States, a call for formally planned urban land delivery was championed by great thinkers like Robert Owen -who made a proposal on how to combine industry and agriculture to reduce the impact of industrialization on the quality of urban living-, J. S. Buckingham (1849) who documented “National Evils and Practical Remedies” as a proposition to addressing the challenges of industrial cities (Gallion, 1950). However, their thoughts were eutopic but sent people thinking about finding solutions to the challenges that come with an uncoordinated and unplanned model of delivering urban land. Some of the measures taken to address the urban challenges included starting up new towns founded on single industries in virgin lands with defined population threshold. A case example was Bourneville company town in 1879 (Gallion, 1950).

Furthermore, Columbian Exposition held in Chicago in the year 1893 is credited for its contribution to the emergence of City and Regional Planning as it created an opportunity for professionals to rethink the industrial cities in terms of preplanned development that achieves various themes like aesthetics. The expo gave birth to the City Beautiful Movement from which Burnham, the chief architect of the Columbian Exposition, cautioned the architects against making little plans since their little plans could not inspire men and they could not at times be realized. He inspired them to make big plans, and so did he open their eyes on city and region-wide planning before development takes place (Gallion, 1950; Reardon, 1992). Through this movement infrastructure such as public open space were part of the planning provision in cities. In the same spirit of addressing the social challenges, Howard (1898) with his ideology of the social cities gave a development pathway that would address the problem of population influx, infrastructure provision, effective development regulation, sustainability, and tenure system.

Catastrophes made professionals, philanthropists, and urban management authorities to unite efforts in finding solution to their urban challenges. The efforts by the movements led to institutionalization of town planning and the birth of planning professional training and practice to champion public interest and welfare. The efforts of the industrial revolution redefined planning as a public good that must be championed by public institutions. Both scholars and legal development pointing towards a dynamic, flexible, and promising venture have so far retrofitted the land delivery pathways that were adapted in the industrial period. This process has consciously been carried forward

to the modern age to date. However, it has put on check the duality that has been consistent with urban land delivery in all the civilizations.

2.5 Emerging Land Delivery Models

Chronology of urban development and land delivery reveals a common origin. The focal point is that man abandoned hunting, gathering, and adopted sedentary lifestyle, which led to the establishment of permanent settlements. Two land delivery pathways emerge from the literature on the various civilizations. The first model is organic with undefined logic. The second model is the formal model drawing its logic and relevance from the social institutions and governance that draws their legitimacy from the societal social constructs.

Major steps in the organic development pathways was that:

- i. Individuals identified an area they felt suitable for settlement.
- ii. They then rerected structures
- iii. Occupied the stuctures

More other people came and repeated the same short process that resulted in agglomertion.

This development process defined the purely organic development process in both cities of the past and the current cities. Ayonga (2019) describes this development path way as Build and Occupy model of land delivery.

Within this model, there is no forthought to have a vision for an urban settlement, agglomeration occurs with no guiding framework. At conception there is no mutual responsibility and cooperation. Consequently no championing of the public interest.

The formal development model is also traced to the same period as the informal. The extent to which this study defines a formal process is founded on the legitimacy of the social constructs in the dawn off agglomeration of families and the emergence of new social orders in the Neolithic period. According to Cambridge English Dictionary (1995), the word formal means public or official. It is further elaborated to mean what is done according to conventions (Cambridge University, 1995). Redman (1978) explains that as soon as man established permanent settlements, the change in the social order created hierarchy and class divide which had to find their legitemacy in theoritical, legal or religious constructs. Eventually, these social changes lead to the emergence of social institutions which were accepted as formal and had a role to play in development. The role of institutions as they grew were mainly to offer leadership and governance in the urban places (Redman, 1978; Pounds, 2005). Therefore, the institutions were working in the interest of the public.

Formality in the land delivery model from the perspective of interrogation of history as presented in the previous discussions in this report indicate that decisions to create urban places were first conceived in a formal institution i.e., the authorities and the leadership systems (Pounds, 2005). In this model of development, the infrastructural needs and the population are anticipated beforehand (Keeble, 1983; Pounds, 2005). In the Iron age, the leaderships identified suitable areas for urban development, these towns were organized in a way that guided streets to be straight and intersecting at right angle, building lines established, frontages predetermined, neighbourhood blocks created and

social infrastructure such as public open spaces, places for public gathering and religious buildings were provided (Pounds, 2005; Fernandez-Gotz, 2018). The residents of these cities had to build in accordance with these development provisions. It is evident that the authorities had to observe compliance with these guidelines and so was the form of the past cities. Those who prepared these layouts of urban areas in the cities of the past were the military engineers, architects according to the vision of the political or religious leadership (Atkins *et al.*, 2015). All these development decisions were formally decided for the welfare of the urban dwellers.

Tracking the formal development pathways to the renaissance period, there is consistency in the key steps and procedures followed to develop a town. These key steps are summarised as follows:

- i. A leader or an authority has to identify area (land) to which a town will be established.
- ii. There has to be an anticipation on the population to be accommodated within the urban area.
- iii. A layout of road network defining urban blocks have to be decided and developed.
- iv. Areas for public activities and spaces have to be set aside.
- v. Plots sizes have to be decided and parcelled out.
- vi. Allocation of these land has to be done by the authority in charge of the urban areas which were either, the religious or political leaders. Notably, the lands were developed based on the conditions, meaning the interest on these urban land were regulated.

The above highlighted steps were the major stages emerging from the development pathways in the cities of the past and even to the industrial cities as presented in the chronology reviewed in the previous section above. Various scholars have described the formal urban land delivery model in various ways. Ayonga (2019), describes development pathways as dictated by urban land delivery approach as Plan, Service, Build and Occupy (PSBO). Ayonga's position re-emphasizes Baross (1987) works that establish the development pathway of plan, service, build then occupy as a description of planned colonies, which he describes as the benchmark of the ideal model. The variations in the development pathways are observable in the history of urbanization globally. This study is also in concurrence with the idea that this model is the ideal and formal way of delivering urban land. It constitutes a for thought organization of land, anticipation of population and their needs, development of infrastructure, decision on parcel sizes before people settle, allocation to people with condition to develop, making control easier since the interest on land is not freehold. In essence, the model offers opportunity to institutionalize development rights for common interest. At the same time, it gives opportunity to optimize provision of infrastructure at the land planning and implementation stages.

The challenges experienced in the formal cities coupled with the social change in culture and needs have contributed to the improvements in legal procedures and infrastructure types. However, they have built on the formality traced from the cities of the past. Advancements in formality took place in the industrial cities where more approaches were introduced to address the factors that lead to distortions in the formal development model. However, it is inherent that the dualism in the development models persists.

2.5.1 *Laissez-faire* / Market Driven Urban Land Delivery Model

A chronological description of urbanization by Gallion (1950) puts together the history of urban development. It builds a case in urbanization from (where man moved from caves to villages through a political formation that later led to the development of the ancient cities) to the classic cities, medieval towns, neo-classical city, industrial cities, and the city of today. Understanding Gallion's works underscore one significant fact about the North and the West's understanding of urban and urban development. From the literature, this study conceptualizes the first urbanization process to have occurred informally. Families and kinship of different origin agglomerated to form a permanent settlement (Gallion, 1950; Pounds, 2005; Springer, Verlag and Berlin, 200; Fernandez-Gotz, 2018).

The process of emergence of these settlements was simple; people simply occupied the land with considerations being safe and near permanent water sources. Individualism guided development in these urban settlements (Pounds, 2005; Elmqvist *et al.*, 2013). Since there were no concerns about the welfare of others, one only needed to build his/her house and reside in it. This pathway has been referred to as the build and occupy model (Ayonga, 2019). A part from disorderliness in the development there were no laws that governed association within the informal settlements. It is within these settlements that social systems evolved.

Hierarchies emerged in the social reorganization to address the challenges of managing complexities within the informally developed urban places. As Elmqvist *et al.* (2013) puts it, these social changes created classes of those who had power and political influence. There were also those who could not accumulate wealth and so they became tenants (Elmqvist *et al.*, 2013). This phenomenon explains the origin of feudalism. The feudal tenure system basically operated on the principle of occupation of land on the basis of service to the feudal superior (Booth, 2003). The advancement in the development procedures in the informal urban places were, therefore, limited to allocation in case one never had the capacity to own land and the development on the allocated land was as per the terms of agreement with the feudal lord or the tenant in chief to the feudal lord. Factors such as infrastructure were limited to roads and public spaces or buildings. Not much of public interest was a consideration in this development model (Pounds, 2005).

Informality was not only conceived in the organic origin but also in the urban areas that were formally created under political, religious or military leadership. This phenomenon is the foundation of the dualism that is common to date. The medieval cities were planned though the indicators of public interest that were considered by the feudal lords were reduced to religious spaces, public buildings open spaces and roads. However, with time these urban areas experienced disorder due to population increase and lack of effective development control (Pounds, 2005). Furthermore, the those who were unable to meet the conditions to be allocated land within the walled cities and those who were dissatisfied by the conditions of within the walled cities moved to the open fields beyond the walls to establish settlements which were not organized in any manner (Elmqvist *et al.*, 2013). Similarly, due to population increase, the unoccupied spaces within the walls were occupied leading to the distortion of the formal layout developed in the vision of the feudal lord (Pounds, 2005).

Informality due to distortion was observed even in the industrial cities. When large-scale and automated production became the main function of the urban areas, more people migrated to the city to offer labour (National Geographic, 2020). The urban areas overgrew their planned carrying capacity. Industrialization came with capitalism, the focus was to intensify productivity and profit (Gallion, 1950; Heller, 2011). Social welfare and living environment was never a concern. Production of goods increased, trade expanded and the entire enterprises moved from homes into separate quarters, also known as factories (Gallion, 1950). The distinction between the employers and the employees widened, pointing to the confirmation of Adam Smith's (1776) theory of capitalism. Infill developments occurred to settle the swelling population. Additional stress on the existing infrastructure, building orientation alignment and setbacks not being observed. Buildings were on a back-to-back basis with no development control. The new development in residential and industrial premises were developed on lots planned for agrarian settlement including the infrastructure (Grabowski, 2019).

Additionally, the developments were occurring on already developed lots and urban area holistically (Grabowski, 2019). The resulting urban pattern was informal. The urban places were characterized by disorderliness, non-optimal infrastructure provision. The streets were narrow, no public sanitary infrastructure, inadequate water supply (Bruton, 1984; Pounds, 2005). Despite starting in formally organized path, these urban places were distorted. Hall (1999) describes development stages in the pre-industrial era, where he refers to the American cities as "City Pathological." A "Pathological city" is interpreted in the context of the usual problems that are typically associated with city life when development in cities takes place in a *laissez-faire* manner. Planning standards, norms and services are never a priority.

From a global perspective, informal delivery model emerges due to the challenges of increasing population in the formally developed urban places in Europe and America with lack of proactive planning to address the challenges (Gallion, 1950), while, in Africa, Kenya in particular, the informality accelerated its development from urbanization in the post-colonial towns and periodic markets (Mabogunje, 1990). It is a highly associated with the transformation of agricultural land under freehold interest to urban land use. I would describe it as an opportunistic model that tries to balance social and economic crises by giving short-term solutions but denying man the opportunity to enjoy livability.

Urbanization /urban development is a foreign phenomenon to Africa. In their nature, Africans lived in simple villages where they could safely protect themselves from wild animals and calamities as they hunted and gathered in the wilderness with very minimal impact on the environment. Urban development could only be observed at the coast of Africa. These were where interactions with the traders from other civilizations like that of the Arabs. Therefore, it is true to put forth that formal urban land delivery model and understanding urbanization as a course that would entail social welfare, and the public interest has not been easily understood by Africa.

Distortion did not only occur in Europe but it also occurred in America. The same phenomenon was experienced in the industrial and the medieval urban areas. It is the impact of the distortions that led to the the movements that were championing the reforms in the industrial cities in both Europe and America. The movements were key

in adding more strategies and approaches to development of urban areas in a formal manner.

In Africa and in Kenya, the foundation of urbanization and urban development is largely grounded on colonial administration and exploitation. Urbanization was not based on industrialization (Mabogunje, 1990; Home, 2012). This phenomenon was in exception of the old towns in the African continent's coastal region, which included Malindi, Gede, and Mombasa in Kenya. The towns were developed as a result of the Indian Ocean trade led by the Arabs. Significant growth of towns was based on railway development and colonial administration. The colonialist established town acted as administrative headquarters and served as their service and residential areas (Home, 2012). Land for the African towns was delivered in a pre-planned manner since the colonialist was keen to have adequate access to infrastructure and utility services (Home, 2012). Furthermore, the towns that existed in Africa before the colonization depicted similarity to the pre-industrial towns and their mode of land delivery, which was rudimentarily pre-planned.

In as much as the informal urban land delivery model was curtailed in the North and the West, the model has since remained endemic to Africa, and Kenya is not an exception. The two informal sub-models were evident in Kenya. Firstly, the periodic markets in Africa became urban areas (Obudho, 1983). The development model of the periodic markets was that the market areas were places where people gathered for exchange of goods on market days. Slowly, the market places were occupied and became permanent residence. These markets were not planned and at no point were their population and infrastructural requirement projected and discussed even by the political leadership. This phenomenon indicates a similarity to the agglomeration in the Neolithic period in Europe, America, and Asia (Fernandez-Gotz, 2018).

Secondly, the dual development pathways of informal urban development was created by the colonial administration. The town planning ordinances gave room for formal development and informal development within the colonial towns and the unplanned native reserves. The African residence were not planned at optimal and the sanitary conditions was sub-standard (Home, 2012). Additionally, The Africans who were servants but were not housed within the African quarters lived outside the colonial towns where there was no formal organization of land and provision of infrastructure (Home, 2012). Labor restriction through ordinances that were passed from 1900 to 1915, restricted Africans' movement to urban areas (Home, 2012).

Finally, the distortion effect was also experienced after independence. When the colonial master left, the bans were lifted, and Africans thronged the urban settlements in search of employment. Demanding land for urban development, more so for accommodation, was on the rise, and planning for an organized delivery for such land was absent. As was observed in Europe and America, tenement housing became profitable, and the areas on the periphery of the previously designated and defined urban boundaries offered opportunity for meeting the demand for accommodation. The density in urban areas and peri-urban increased, empty spaces occupied. Furthermore, the urban fringes have become more attractive for residential development (Howard, 1898). The urban fringe was and is continuously subdivided and developed into urban to meet the accommodation demand. All these development happen without a prior forthought and coordinated planning for infrastructure and carrying capacities for the population.

This study's discussions indicate that the informal model of urban land delivery emerges from both the pre-planned and organic urban developments. The preplanned urban areas whose land was delivered in the formal and ideal urban land delivery model later find themselves in the informal model when proactive forward urban planning and development control is not institutionalized and undertaken. Currently, the informality in urban land delivery has contributed greatly in dipping Africa into the mess of not achieving the fruits of planning effectively: social welfare and a livable quality of the living environment. Like other African countries, Kenya has made the informal model of urban land delivery formal through land-use planning legislation that has made approval of developments such as land subdivision and change of use formal processes. The land subdivisions and change of use in most cases are thoughtlessly done and uncoordinated since no broader plan guides them in most urban areas, particularly in Kenya.

Currently, urban areas emerge in Kenya where land is purely delivered in development path that has no coordinated land use organization in prior. This occurrence is common in areas that land is held under freehold tenure and land subdivisions have occurred progressively, welcoming urban activities, densities, and intensities of land use. Many informalities emanate from this formality of uncoordinated subdivision, building approval, and issuance of certificate of compliance in such settlements. Growth takes place more organically with planning standards of provision of physical and social infrastructural services not observed while these areas transform into serious towns. The subdivision process in law does not provide for how to allocate the necessary infrastructure rationally. Allocation is discretionary based on the surrendered land.

Land subdivisions have characterized informal land delivery systems in Africa, and so is it in Kenya. The subdivision is recognized as the first stage of conversion of rural land into urban land. Its purpose is to ensure order and efficiency in developing areas incorporated in townships or urban areas (Agheyisi, 2018). The subdivision has been higher in the peri-urban areas due to the rapid expansion of urban areas in Sub-Saharan Africa (Agheyisi, 2018). Since subdivision of land is development on land as recognized by planning law, there are planning regulations and standards that apply to protect the public interest. In the developing countries, land subdivision standards have been criticized for being ineffective, and a contributor to informality in urban areas as there is the tendency of the developing countries since they increase development cost making access to land by the poor is inadequate (Agheyisi, 2018). Payne (2001) argues that “it is because of the unrealistic nature of land subdivision regulations that there is the tendency of the developing countries to ease land subdivision and building standards by reducing lot sizes and eliminating amenities” (Payne, 2001). The implication of this kind of decision of the developing countries bears heavily on the effective implementation of development control when the land is finally delivered for urban development. Such kind of action leaves development control to only regulate the bulk of built form and not to ensure that amenities are within the required standards. The outcome of this kind of situation is deficiency in infrastructural services and amenities within the urban areas.

Urban land delivery that is private sector-led always stems from the subdivision, as identified in the discussions above. Within the subdivision process, land can be delivered formally or informally in the existing legal dispensations in Kenya. That being the case, formal land subdivision, as identified by Agheyisi (2001) is that subdivision

that is based on a plan. The plan is drawn to scale and indicating the context of the site of interest with clear dimensions and estimated layout of subdivisions. Further, Agheyisi (2001) underscores that “subdivision is always prepared for permanent records and approval by the planning authorities.” When urban land is delivered through such a valid procedure, it is acknowledged in this discourse as a formal urban land delivery system.

The informal subdivision is identified by Agheyisi (2001) as that subdivision that is undertaken and does not conform to the urban planning regulations and development control norms and, to some extent land tenure regularization (Durand-Lasserre, 2006). It is a method that has been identified to be common in the peri-urban areas of Sub-Saharan African countries (Agheyisi, 2018). A study conducted in the nine Sub-Saharan African countries between the year 2003 and 2004 revealed that “the customary land delivery is being progressively replaced by “neo-customary practices,” which was identified as the combination of reinterpreted customary practices with other informal and formal practices” (Durand-Lasseve, 2004). The study also established that “at the periphery of Sub-Saharan African Cities, informal land delivery processes are influenced by actors referring to customary legitimacy” (Durand-Lasseve, 2004). In other words, land supply at the periphery of Sub-Saharan African cities land is slowly taking place informally. The study in Tanzania reveals that informal subdivision is common in the rural areas incorporated in municipalities where land is rapidly being converted for urban land use (Agheyisi, 2018). Such land delivery models are deemed informal, as they do not comply with the established planning standards and norms.

Informal land delivery models have been on the rise within the urban areas and in their periphery due to various reasons, which research has established. Musyoka (2004) established that there are inadequacies and inefficiencies in the formal land delivery models. The manner in which the government land is being allocated has not been able to meet the land demand for the urban poor, and so the informal system has been the solution (Musyoka, 2004). According to Leduka (2006), land for housing in most African cities is delivered through informal or semi-formal processes. Leduka argues, “The informality and semi formality in delivery has been overlooked for quite some as the majority of the African States were colonies of the Europeans that had set formal ways of urban land delivery, where there were formal rules and regulations that governed access to land in urban areas.” A further argument from Leduka (2006) is that land delivery processes “should transcend formal institutions established through state law, to the consideration of how actors that are external to the state interpret, use, or challenge formal rules and the bases of their power to do so” (Leduka R. C., 2006). This argument draws from the fact that informal or semi-formal land delivery is very instrumental and common in addressing access to land for urban development. However, the fate of infrastructure is not part of the debate.

In Uganda, the private and formal public sector's failure to provide land for housing for the low and low-middle income groups has contributed to the development of informality in land delivery models. The state is unable to provide alternative land delivery models for the low-incomes. There is rare affordability of the public land development projects. Some of the reasons behind this phenomenon include highly complicated and too rigid urban land delivery; market-oriented approaches of public land development agencies. Formal private sector development is limited by existing restrictive regulation and inappropriate development and constructions norms and

standards; Timeframe imposed for development to beneficiaries of plots of land allocated by public authorities is not compatible with incremental development processes on which poor households have no choice but to rely on. Public land delivery is undermined by corruption and illegal practices. These are some of the challenges that elevate the informal land delivery systems for urban development in African countries.

The model and speed in which urbanization takes place in Africa is a great contributor to the informality on the delivery of land for urban development. The urbanization rate in Africa is as high as 40% (UN-DESA, 2018), while the pace with which funding and policy development is done to deliver land for urban development is not commensurate to the demand. Instead, structures and institutions are put in place to formalize further the informality and doom African hope of getting the ideal and functional model of delivering land for urban development.

Land delivery systems are embedded within structures and agencies that are both formal and informal. According to Leduca (2004) and Giddens (1984), “structures and agencies are key in decision-making, action, and power relations between actors who, in terms of outward appearance, might seem unequal with respect to control over the societal institutions that might ensure access to resources such as land.” Furthermore, Mbiba and Huchzermeyer, (2002) put forth that, “it is within structuration that there is the ability of the actors to modify, challenge and formalize the state rules to create opportunities to changes to the rules themselves and the relationships between state structures that control land delivery and non-state actors.” The structures in place are key in land administration and management to ensure that land use conforms to the state's aspirations and communities or, rather, the actors. Therefore, agencies are key in formulating the regulations and the policy guidelines that the various agencies are mandated to do. In this context, institutions and laws are put in place to govern the delivery process and systems as well as to regulate the use to which land is put.

Urban land delivery models can be public (government) or private sector-driven. The public sector driven urban land delivery systems could be through the allocation of public land, done through schemes, or through planned systems or government sections (Rakodi & Leduca, 2004). Musyoka (2004) reiterates this by stating that “land for urban development can be delivered through the allocation of public land, purchase of land through the market, delivery of customary land through state-sanctioned channels, delivery through customary channels to members of the group, allocation by officials, purchase of customary land, self-allocation” (Rakodi & Leduca, 2004). The delivery model can be formal or informal, depending on the level of compliance with the existing land administration system (Leduca, 2004). Even at the formalization of planning legislation, and as can be traced to the 1900s, land delivery was undertaken by the public and private sectors.

The organic growth is only concerned with availing land and at no point is the concern about infrastructure provision becomes a concern. As long as land is available, construction follows. Furthermore, having surrendered land the developed is free to proceed even without a coordinated land use plan for the broader area beyond their parcel of land.

2.5.2 Formal Urban Land Delivery in the Global Perspective

The discussion about land delivery models in the previous sections of this discourse defined the contextual understanding of formal development pathways. It settled on the fact that formality resonates with conventions, and general acceptability. Literature indicates formality in urban land delivery in two different ways. There is the pre-planned, described as a formal model (Baross, 1987; Ayonga, 2019), and there is the incrementalism pathway that occurs through the change of use from agricultural to urban land use (Musyoka, 2004, Leduka, 2006; Durand-Lasserve, 2006; Agheyisi, 2018). However, the formality in the change of user is dependent on the extent to which the development is coordinated and that conforms to the land laws (Ayonga, 2019). The two scenarios result in a context whereby land is either set aside for urban development, and a plan is prepared to predetermine use and to guide land uses. The second scenario is where the use of land is just subdivided and converted for urban development or in some instances; the use of land is changed from agriculture to other uses that qualify them as urban.

This section appraises the two perspectives of land delivery are evaluated from a chronological perspective. The perspective is observed from man's pre-industrial natural nature to organize his space to enjoy a livable environment led by the emergence of the social institutions and political, religious leadership, the survival instinct of man when confronted with social and economic challenges that would deprive him of enjoying livability and ultimate survival in subduing the earth. The study considers the preplanned urban land delivery model in the pre-industrial, post-industrial period and how the model has evolved.

Antiquity reveals a rational approach to urban development in a conscious manner. In the iron age, classical cities, medieval, renaissance, and industrial cities, there was the standard steps of identifying land, planning the layout of activities and structures, and availing providing basic infrastructure, allocation of plots and allowing people to put up structures (Pounds, 2005; Elmqvist *et al.*, 2013; Fernandez-Gotz, 2018). The ancient and medieval cities were planned before people settled in them to undertake economic activities and seek protection from other communities (Pounds, 2005). Peter Hall (1992) reaffirms this position by underscoring that urban areas' planning was undertaken even before the industrial revolution (Hall, 1992).

The history of how the land was availed in the pre-industrial cities reaffirms a rudimentary model of a preplanned urban land delivery. It was a concern of the leadership to share with the engineers and architects who existed those times to coin their vision into art in the form of a plan to be realized through construction (Moris, 1997). It is also clear that these cities lived up to the dawn of the industrial revolution and so the model in which land was delivered remained the same in the industrial cities.

The industrial revolution brought with it a chaotic situation in the urban places (Bruton, 1984). The consciousness of man about his living environment and urbanization, as a course, was masked by wealth creation and accumulation through production and the end expansion of trade and commerce in the industrial cities (Gallion, 1950). Urban areas grew beyond their boundaries and without a proactive forward planning of land before allowing people to develop and settle. The result of the phenomenon was chaos that led to the birth of public health and urban planning profession because of concerns

raised when man's survival instinct kicked in (Gallion, 1950; Bruton, 1984; Hall, Urban and Regional Planning, 1992). Social and sanitary movements emerged in Europe and America. These movements were agitating for improvements in the sanitary and living condition within the industrial cities.

In Europe, Garden City Movement emerged to champion the development of social cities, which were well organized and upheld human dignity. In his theory of the Garden City, visionary leaders like Ebenezer Howard held the view that urban areas would be created with a population threshold in mind upon which new ones would be created when the threshold is reached (Howard, 1898). In his theoretical concept, Howard creates a framework for delivering urban land through a planned system in what is understood as the social cities. Howard gives a clear framework of preplanned land delivery model that has shaped the urban planning landscape in law and in practice to date. Howard borrows the ideas that existed in the medieval and classical cities with a clear perspective of institutionalizing planning and achieving firm control of development with an active forward planning to address population growth and the inherent dualism in development pathways.

Howard starts his ideology by suggesting that there should be "a bold plan comprehensively prepared on a virgin land (Howard, 1898)." An approach he says avoids, huge compensation, vested interest and potential social revolution (Howard, 1898). Further, Howard notes that the population to be domiciled in each town should be to a threshold of 32,000 with 30,000 in the town estate and 2000 in the agricultural estates. A trustee is created to be responsible for the development and management of the town. It is through the trustee that the government has issued finances on loan to build the Garden City. The same trustee is conferred the property owner rights on behalf of the community of the Garden City (Howard, 1898). Howard describes a layout plan of the town to be having the central park, boulevards, railway (transportation network), open spaces, residential, agricultural, industrial areas, schools, churches, library, museum, hospital, public market, swimming places, water, and sewer system. Keen to note, Howard (1898) defines the lot sizes (20feet by 130 feet) with a population density of 5.5 persons per lot. Howard further ensures effectiveness of the regulatory authority (board of management) by defining property rights in purely leasehold tenure and collection of land rent. The use of the rent defines sustainability of the city in providing services to its residents and settling the debt accrued from the purchase of the land on to which the garden city was built. Howard (1898) addresses the problem of dualism by ensuring that the land surrounding the Garden city is not owned by the private individuals but also held by the Garden city community. The impact of this decision was to prevent informal development model to take course beyond the boundaries of the Garden cities. In addressing the sprawl and dualism that was inherent in the cities of the past and the current cities, Howard (1898) recommended the establishment of new cities with the same principles of the first garden city. The underpinning principles of city development underscored include social opportunity, beauty accentuated by green spaces, orderliness, and lastly convenience (5minutes movement from the edge of the city to the center) (Howard, 1898). Finally, it was interesting that a quasi-public institution managed the Garden city. The institution was to hand over the city to the municipality once the city could stand on its own and effectively implemented with all its debts settled (Howard, 1898).

Summarizing the Garden city's development model as postulated by Howard bring out the following logical steps.

- i. There was a forethought about the garden city (Vision carried by a leader).
- ii. A plan is drawn with population to be settled in mind. Within the plan, development regulations and strategies of financing the project, risk assessment and mitigation measures provided including sustainability plan. These became the factors to be implemented and enforced.
- iii. The land required is determined based on population needs and healthy development standards, which define the densities.
- iv. Suitable land is identified and acquired. This land has to have very limited compensation issues preferably agricultural land (green fields)
- v. An institution (Authority) is created to implement the plan for the garden city.
- vi. The land is allocated for the infrastructure (physical and social), housing and economic developments as articulated by the garden city plan. It is through land that revenue is generated for debt resettlement, infrastructure development and service provision.
- vii. Construction works take place - both for infrastructure and private investments - based on the prioritization of the needed infrastructure regulated by the established authority.

Howard's proposed development model was not out of the blues. He actually gathered the development processes in the past, understood the role of the institutions and players, the property rights, and the challenges they pose to urban place. He then organized them in a rational logical and coordinated framework that the roles of the institutions are defined, tenure issues addressed by selection of the suitable tenure system in the context of urban development.

Just to reaffirm the fact that none of the components of Howard's proposed development model was new, this discussion refers to the history of civilization and development pathways in the cities of the past. The new town concept was the defining trait of the medieval cities (Pounds, 2005). Infrastructure provision was provided for in the cities that were developed by the religious and political leaderships (Pounds, 2005; Fernandez-Gotz, 2018). At the same time, freehold tenure systems rarely existed in the walled cities that were controlled by the religious and political leadership. The feudal tenure system was inevitable (Booth, 2003). Finally, the management of walled towns were under the social institutions that were created by agglomerations of kinships and families (Elmqvist *et al.*, 2013). Howard simply aligned the developments of the past to result in to a desirable social space. He improved the formal foundations of the previous formal urban land delivery models. It was in deed a pre-planned development model.

Howard's (1898) idea proved workable and realistic. The idea reshaped the formal land delivery model by enriching the infrastructure requirement and provision approach. It was later supported by great scholars like Patrick Abercrombie and Patrick Geddes, who extended the scope of Planning beyond the scale that Howard envisioned (Hall, Urban and Regional Planning, 2002). The common understanding of these scholars is that urbanization is never in isolation of the hinterland. It is anticipated to spread and so, even the neighboring lands should be prepared for future urbanization through planning (Gallion, 1950).

With the emergence of town planning as a conscious practice, a pre-planned urban land delivery model re-emerged but with different dynamics. Their theoretical proposition later on informed and inspired policies and legislations in delivering land for urban development in a preplanned model as seen as from 1909 in Britain (Osborn, 1918) and in the formulation and enactment of the Housing and Town Planning Act 1909 and 1947 Town Planning Act (Bruton, 1984; Hall, 1992; Booth, 1996;).

Housing and Town Planning Act 1909 gave the local authorities in Britain the power to prepare a scheme plan for areas where development is anticipated. It further empowered the local authority to impose land-use regulations on the area whose scheme plan was prepared (Booth, 1996). Though it was not mandatory to prepare plans at this period, there was an attempt to anticipate a particular outcome within which land use management and regulations intended to achieve. It was a right move to logically arrive at a goal by first developing a policy context before enforcing a law. In 1909, Planning was set out to achieve order, sanity, and embellishment. At this point, the Act proposed a zoning system. The zoning system was to ensure that control over location could be exercised only within the context of a planning scheme and with the provisions that the development respected the location and management regulations (Booth, 1996). Therefore, schemes were prepared by the local authorities to cover the built and the unbuilt areas (Booth, 2003). In this context, the land was being delivered for urban development in a pre-planned approach. With Planning coming first, land uses for infrastructure was assigned before development took place. Williams (2014) held the same view that states in UK predicted urbanization trends and provided the required physical development and infrastructure so as to provide guidance on urbanization and to protect other land and land-based resources (Williams, 2014).

In 1935 the United Kingdom's Departmental Committee made a recommendation adapt the principles of the garden city in building the new towns (Osborn and Whittick, 1977). These new towns were building on the foundations of the Garden city- improvements on the formal land delivery model. In 1940, Barrow Royal Commission Report became a policy on new town development (Gibberd, 1980). The report acknowledged the complexities of correcting the informalities and recommended new town development as a means of decentralizing development from the large London (Gibberd, 1980). Further borrowing from the ideal model developed by Howard (1898), the British government established a central planning authority in 1942 -the Ministry of Works and Planning (Osborn, 1918).

The post war reconstruction of Europe created an opportunity to institutionalize preplanned model of development in Europe and in this case Britain. The great London plan of 1944 borrowed from the same principles of new town and proposed eight new towns within 80 kilometers of London (Abercrombie, 1944). New town committees were created with the mandate of establishing, developing, organizing, and performing administrative functions in 1945 (Osborn and Whittick, 1977). Additionally, Reith was appointed as the New Town Commission's chairperson in 1945 (Hall, Urban and Regional Planning, 2002). The report by Reith gave logical and procedural approach to new town development concurring with the development pathway that Howard theorized and experimented. The commission's recommendations were as follows.

- i. The population threshold in the new towns should be 60,000.
- ii. The towns should be developed on Greenfield.

- iii. The towns should be of low density with single-family housing.
- iv. Residential houses and homes adopt the neighborhood concept and they should be organized around nursery and primary schools, a pub, and shops.
- v. He also added that there should be a balance between residential/accommodation and areas for employment.

The recommendations from Reith were key to the formulation of New towns Act of 1946 in the UK. Later in 1946, New Towns Act was passed to allow the parliament and the UK government to designate areas for new town and gave the Development Corporations the development control functions. The Act supported the development of thirty new towns in Britain (Keeble, 1983). In 1947, the historic Town Planning Act was passed, revolutionizing town planning (Ministry of Housing and Local Government, 1947).

The Town Planning Act was a total game changer in the boosting the ideal land delivery model in various ways. First it made planning practice to have a legal backing. Section 5 of the act required the formulation of development plans by the local planning authorities so as to guide development and to be the basis of development control and a basis for redevelopment and comprehensive development. Secondly, the law established the mandates of the planning authorities. Section 4 of the Act establishes the local planning authorities. Thirdly, the Section 12 of the Act Nationalized development rights and so all citizens were to seek development permission and the developments were subject to development control regulations which were policy directions in development plans. Fourthly, Section 37 of the Act gave a provision for compulsory acquisition in the interest of the public (Ministry of Housing and Local Government, 1947). Just like Howard's ideology, the Town and Country Planning Act improved the formal land delivery model with a coherent totality and modernization (Keeble, 1983). It made town planning to be operational and working in the European system of urban development with the opportunity to reconstruct provided by the results of World War II.

Further more, the ideal and practical works of Howard have been furthered by scholars to champion a formal land delivery model. Keeble (1983) outlines the procedures of preparing a town plan in a consistent process as that of Howard. Keeble defined the development process to include;

Identification of need which he calls the regional brief of the town (context). He includes population and culture of the population as consideration in the initial stages.

He states that similar development of towns are more easy on virgin lands with the following stages and considerations.

- i. Base map is developed to give insight on the development decision on land allocation to activities.
- ii. Development standards are considered for housing, central areas, economic development areas, schools, public open spaces and large investments.
- iii. Decisions on urban texture -building density and intensity are made.
- iv. Road network are decided to provide accessibility to the activity areas and that's where the planning design ends (Keeble, 1983).

From Keeble's theoretical proposition, and in the context of this dissertation, it is deduced that, in the formal urban land delivery model, first an empty land has to exist. Secondly, optimization of infrastructure provision starts with the projection of the infrastructure land

requirements. Finally, land use allocation in a planning scheme to inform the implementation and control. However, Keebles development process ends in the design stages.

The pre-planned development model was a deliberate effort to prepare, and prove a plan within which land use shall be controlled (Booth, 2003). Planning was, therefore, the vehicle within which public interest and social welfare were identified and articulated within a specified period. No wonder, Fograty (1948) said that “town planning aims at creating communities that are fully equipped with physical means for satisfying social life.” Planning, in essence, provides a whole package that promotes livable communities and societies. On the other hand, Foley (1960) viewed town planning as an arbitrator and a coordinator that reconciles competing land use to provide a physical environment for forming a healthy and civilized life (Foley, 1960). In the definition of Planning, as presented by Fograty and Foley, the occurrence is understood in the context of an environment that planning provides. It points out the social welfare and public interest that the universal control instituted in the Town planning Act of 1947 intended to achieve.

A study conducted by Peter Hall (2014) and Monk *et al.* (2013) in assessing the “Role of Planning in the Achieving Good Cities” and “Better Lives and Provision of Land for Housing Development” respectively, gives a summary of the findings on how planning contributes to the delivery of land for urban development and infrastructure provision. The two studies provide information on “the performance of planning in the Netherlands, Germany, France, Scandinavian countries, and Australia” (Monk *et al.*, 2013).

The first case example of a pre-planned model of urban land delivery is in the Netherlands. In Netherland, the local authority bought land from private individuals to provide infrastructure. Purchasing of land, provision of requisite infrastructure, came first while percolation into plots followed. The lots are sold out to recover the cost of planning and service provision. The areas are then developed privately (Monk *et al.*, 2013). In the Netherlands, priority is given to active planning, which Needham (2014) refers to as planning by projects.

Furthermore, Buitelaar (2010) put it forth that land designated for urban development in the Netherlands was bought and sold by the municipal companies. The provision of infrastructure was, therefore, efficient, and effective to the required standards and norms. The provision of infrastructure was made easier since the cost of such services was recovered from sales of land whose values increased after servicing. In essence, the cost of providing infrastructure would be high if the service provider is gone on private land.

The second case example of urban land delivery is Australia. Monk *et al.*'s (2013) study revealed, “*There is an urban containment policy that extends urban areas over time, increasing the supply of land on the metropolitan fringe in Australia.*” As presented by Monk *et al.* (2014), the Australian case does not give details on how infrastructure is provided. One important perspective that it brings on board is that the Australian model of urban land delivery is based on a policy framework that is rooted on a periodic review on the need for more land for urban development, which is a preplanned model of urban land delivery.

Conclusively, the above-described model is the ideal and formal-preplanned urban land delivery model. It optimizes infrastructure and it is centered on achieving the public's interest. More importantly, it is led by the government, which is the only authority concerned

with public interest. The government, therefore, uses the eminent domain and the police powers to affect the planning proposes that foster welfare.

2.5.3 Formal Urban Land Delivery Model in Local Perspective (Kenya)

Kenya depicts both the formal system of the cities of the past and the British's modern formal land delivery model intertwined in the law. The coastal towns in Kenya, as was identified earlier were developed within the formal system under the plutocrats. Fort Jesus in Mombas, lost cities like Gede ruins depict the rudimentary formal organization of space with limited infrastructure provision.

The modern pre-planned urban land delivery model took effect in Kenya in the colonial period. Kenya was a British protectorate and later on a colony. Since Kenya was not industrializing, the towns' prosperity was founded on administration and transportation by the British government. The British understood urbanization as a course and an area where they enjoyed livability. This spectacle meant that these urban areas had to be well planned, with public health, safety and infrastructural services had to be provided within the recommended standards. Detailed planning of some of the urban areas in Kenya was not realized as compared to Mombasa, Kisumu and Nairobi (Home, 2012). In this section, this study first looks at the general theoretical literature surrounding the formal land delivery model in Kenya then look into the legal system and how they have impacted the formal land delivery model in Kenya.

The approach was more of development regulations that were based on legislative directives. When the British established the urban places in the interior of Kenya, they were already understanding the need to have a preplanned urban land delivery and firm control at the implementation stage. By the time Africa was being partitioned, the revolutionary movements were going on in Europe and America. It is at the same time that social reforms courses were chatted in Europe. In 1898, the pre-planned development model was applied in Nairobi. Identification of Nairobi by Sir George Whitehouse led to the tasking of Arthur Church to prepare the first layout for Nairobi as a railway depot in the year 1898 (Deisser and Njuguna, 2016). From this precedent, it was clear that urban development as was led by the Colonial government was led by a plan.

Still on Nairobi, the second plan was prepared in 1926, which extended the boundary of Nairobi. The defining principle of development was racial segregation and exclusion (Mazingira Institute, 1993). Within these zones of the whites had their zones well planned with low densities, adequate water supply, and adequate provision of social infrastructure. The indians had their bazaas at medium densities with relatively optimal provision of services. The African quarters were unplanned with poor social conditions (Twinokwesiga, 2020). However, the land for the African quarters was delivered within a formal planning framework prepared by the preparatory authority appointed by the Governor of the East Africa. Land Ordinances later on, guided the development pathways in the formally developed urban areas in Kenya. The formal land delivery model in Kenya was founded by the colonial administration. This study, therefore, reviews the formal/preplanned land delivery model based on the legal frameworks (Ordinances and Acts) in Kenya.

Kenya, also known as the East African Protectorate under the first periods of colonial rule, was governed by various laws that were applied in a segregated manner on the various races and geographical spaces (Home, 2012). Specifically, the laws related to land were mainly formulated to alienate land from the Africans, allocate the land to the settlers'

farmers, provide regulations and conditions for land use, and create welfare for the white settlers. The first land law that altered rights and interest, the Crown land ordinance of 1902 under section 30 and 31, declared all the unoccupied land to belong to the crown and was transferable to the European settlers on a leasehold interest. With the power of alienation, transfer, conveyance, lease granted to the Commissioner of Lands (East African Protectorate, 1903). Section 2 of the Ordinance stated that:-

“All conveyances, leases and licenses for the temporary occupation of Crown land made on behalf of His Majesty shall be made, and all proceedings, notices, and documents under this Ordinance shall be taken or drawn, in the name of the Commissioner, and save as therein otherwise provided shall be deemed to be made under and subject to the provisions of this Ordinance and of any rules for the time being in force under this Ordinance.” (East African Protectorate, 1903).

The land that was leased for the purposes of residential (Building as identified in the 1902 Crown Land Ordinance) required the lessee to provide infrastructure and build as per the condition of the implied covenant in the lease. Section 15(c) of the Ordinance stated that the lessee: -

“To provide reasonable drainage and water supply, having regard to the situation and purpose of the building and the health of the neighbourhood.” (East African Protectorate, 1903).

The conditions of lease in the Crown land for the residential area ensured no informality since the lease was a covenant between the developer and the Crown represented by the Commissioner of Lands. Further more, the Regulations passed in 1903 prevented selling or letting of crown land outside the area of township. Section (1) of the 1903 Crown Land Ordinance Rules stated that “No Crown Land shall be sold or let outside the area of any township or station within a distance of 100 feet from the center of any public road.” (East Africa Protectorate, 1903). This advisory was a way of preventing difficulty that may emerge if urban boundaries would be extended to land that were being held individual interest and rights. Even if these residential areas were to be subsumed in urban areas they were developed according to some formal standards and regulations. They also ensured there was provision of infrastructure.

In 1903 Township Ordinance was introduced. Section 2 of the East Africa Township Ordinance gave the commissioner the power of declaring any place within the protectorate as a town and its boundary determined (East Africa Protectorate, 1903). Further, section 3 of East Africa Township Ordinance, 1903 also permitted the Commissioner to pass township regulations to guide the day to day management of the township development activities. The formality in the establishment of the urban areas was due to the fact that it was a course that was started by the commissioner. The establishment of the boundaries was however arbitrary (Secretary of State for the Colony, 1955). Further, to the delineation of the boundary, the urban area was planned for European settlement and administrative functions. The Township Ordinance of 1903 created 11 towns in Kenya (East Africa Protectorate, 1903). Apart from Nairobi, urban areas like Kisumu had 2.5 miles radius for township under the colonial rule as was advised by the Township Ordinances of 1903 and 1919 (Home, 2012; Colony and Protectorate of Kenya, 1922). Land was identified; its boundary defined by the Governor in Council; surveyed by the authority of the Governor through the Commissioner, planned by a town planning

advisor, allocated for infrastructure before the remaining land was alienated/allocated to for residential, commercial, and industrial development. The Crown land ordinances of 1902 and 1915 influenced preplanned urbanization in the crown land leaving out the African reserves without planning. Yet it was through planning that land for infrastructure provision was provided at optimal.

Later in 1915, the Crown Land Ordinance, 1902 was repealed by Crown Land Ordinance 1915. Section 5 of the Ordinance by declared all the land to belong to the crown, including those occupied by the natives and so the agents of His Majesty had the power to control development in all the land in the Protectorate (East Africa Protectorate, 1915). The ordinances enabled the authorities to own to control land use and influence development on the both urban and rural land. More of formal approach to controlling development was based part III of the Crown Lands Ordinance 1915. It stated that:-

“Lands Officer may cause any portion of township which is not required for public purpose to be divided into plots suitable for erection of buildings for business or residential purpose...(Section 15)” (East Africa Protectorate, 1915).

Further section 16 of the Ordinance declares that the granting of lease shall not exceed 99 years (East Africa Protectorate, 1915). Sections 17 (c) (d) of the Crown Lands Ordinance, grants the Lands Officer to determine building conditions and covenants to be incerted in the lease (East Africa Protectorate, 1915).

Further subdivisions which constituted development on land were prohibited on town plots. They therefore required surrender of the original lease and granting of new lease that was subject to approval by the Governor with terms and conditions of development including modifications. These directives were according to section 24 (1), (2), and (3) of the Crown Lands Ordinance (1915). Additionally, According to Sections 25, 27 (d), 42, 43 (1) (2), 44 (1)(2)(a) the subdivision of agricultural lands and farm lands were restricted and their approval were at the descretion of the Governor. At the tail end of the process of delivering land was the registration of transactions relating to Land.

The Registration process required the submission of documents to be registered by the Registrar of Crown Land. Within this process, the nature of which land was developed was ratified. Section 113 (1) of the Crown Land Ordinance (1915) required submission of plans or maps indicating the area for which the land transaction is sought to be registered. According to Sections 119 (1), (2) and 120 (2), the plans that accompanied the documents for registration had to be signed by Government surveyor or Licensed surveyor and counter signed by the District surveyor. This was the process be it that the land was situated in township or outside the township boundaries.

The urban land development model that was created by the Crown Land Ordinance, 1902, 1915 and the Township Ordinance 1903 ensured that development on land was preceded by a prior organization of land and user determined before alienation for building purposes was permitted. Section 15 of Crown Land Ordinance, 1902 clarifies that land that is not set aside for public purpose may be divided into plots suitable for erection of buildings for residential or business. From that clause (section 15), it is clear that before any development was permitted land had to be allocated for public use in urban areas. Public Purpose in the context of colonial ordinances included social and physical

infrastructure that upheld social welfare of the public (East Africa Protectorate, 1903; 1915).

Additionally, when the commissioner of lands for lease or licensing was alienating land, it was mandatory for special conditions for development to be attached to the lease, which was a covenant between the lessor, and the lessee. Development had to follow the development conditions that were provided on the lease. The approach was to control development to achieve conformity with the order that the Commissioner desired in towns.

The Crown Land Ordinance (1915) also ensured that land subdivisions and transfers were controlled to achieve welfare and order. On this basis, the Ordinance restricted subdivision of leased land except with the consent of the registrar or the Governor. In case a subdivision was done the registration of, the transactions and conveyances on such lands required the responsibility of professionals, which in this case were either Government Surveyor or a registered surveyor, the Director of survey who had to sign the subdivision plans before the transfer, and transaction documents were registered by the registrar (East Africa Protectorate, 1915). In this context, this model of releasing land for development could check the informality that characterized the areas that were beyond the urban areas. In essence, the licensed surveyor or government surveyors were the preparatory authority of the subdivision plans for crown land. The Director of Survey was in fact the approving authority in the land subdivision and registration process.

However, up to 1919 there was no ordinance to provide for holistic planning of urban areas. The Municipal Corporations Ordinance, 1909 only equivocally granted the Municipal Council the powers to divert, close, reconstruct, acquirer streets, roads, and tramways with the approval of the Governor in Council (East Africa Protectorate, 1909). Sections 38 (2), 40, 43, required that, in enforcing this order the local authority was required to prepare a plan to show the development and the areas it affected and a notice was to be provided to that effect to notified the occupier of such lands.

Up to 1919, (before the passing of the Town Planning Ordinance, 1919) the emerging land delivery pathway can be deduced from the colonial government's tradition of establishing urban areas on a green field, planning the land to allocate land for public purpose, with the help of a town planning advisor as was established in the history of Nairobi (Deisser & Njuguna, 2016). When land was being alienated for residential or commercial development (business), either through lease or sale, it was subdivided and special conditions imposed on the land restriction further subdivision, which might cause additional stress on the public facilities and controlled the site character, building structure and form. In essence the restriction of subdivisions of town plots controlled the densities in the urban areas while the special regulations on the buildings with relation to sanitation to champion public health, safety and convenience. It was evident that the colonial government acknowledged that it is through planning the land that infrastructure provision is optimized before allocation of the land for residential and commercial development.

Similarly, on the Land that was outside townships was also subjected to a formal delivery process. Subdivision was prohibited in both agricultural and township land except with

the consent of the Governor through the Lands Officer. Section 24(1) of the Crown Lands Ordinance, 1915 stated that: -

“In every lease of town plot under this Ordinance, there shall be implied by virtue of this Ordinance a covenant by the lessee not to divide the plot and assign any portion thereof.” (East Africa Protectorate, 1915)

On Agricultural Land, Section 42 of the Ordinance gives the same prohibition with reference to agricultural farms.

Further, Section 24 (2) states that: -

“If the lessee of a town plot is desirous to dividing such plot and assigning a portion thereof, application shall be made to the Governor through the Land Officer to accept a surrender of the lease of the plot and to issue new lease of the plot in parcels.” (East Africa Protectorate, 1915).

With the endorsement by a registered surveyor or a government surveyor and approval of the Director of Survey (East Africa Protectorate, 1915). With such condition of improving as implied covenant on the agricultural land and prohibition of leasing, or subdividing the lands outside the townships were within formal development framework and do even if they were to be declared townships, the provision of infrastructure would be easy since there were no cases of informality beyond township boundaries.

The rules and ordinances that governed land development created a land delivery framework, which had the following considerations:

- i. The initial stages of identification of suitable place to establish a town or declaration of an area as an urban area by the Governor in Council (East Africa Protectorate, 1903).
- ii. Distribution of land for infrastructure (public purpose) by the government. This stage established the Governor as the planning authority. He could also appoint an individual to prepare the plan for the urban area. Preparation of a plan was however discretionary.
- iii. Allocation of land for residential and business purposes in which the Commissioner of Lands (as from 1902 to 1915) and Lands Officer (as from 1915) was the Authority. If it involved subdivision, then a licensed surveyor or a government surveyor had to sign the subdivision plan or maps which were to be certified (counter signed) by the Director of Survey. At this stage the government surveyor for the registration of the land so subdivided to be made under different titles did the subdivision.
- iv. Implementation and control were also a factor in this process since the Commissioner of lands was given freedom of entry into property leased and the subdivisions of land were subject to the approval by the Governor and the relevant town committees or council (East Africa Protectorate, 1903: 1915). While building one had to comply with the building conditions inscribed in the lease. Furthermore, conditions of lease were development control instrument that guided the implementation process upon which the breach was subject to penalty or imprisonment (East Africa Protectorate, 1915).

- v. Windfall Gains were to be taxed so that the funds can be used to improve other areas

Preparation of town plans (also referred to as town planning schemes) was not embedded in any legal framework up to 1919 when the Town Planning Ordinance was passed. It was the dawn of preparation of the town-planning scheme. This Ordinance improved the urban land delivery model and created a more modern framework but building upon the previous ordinances and regulations.

Town Planning Ordinance stabilizes the course to get the answer to the hypothesis in this study “that deficiency in social and physical infrastructure in urban area could mean that the predominant land delivery model is unplanned (*laissez fair* or market driven).” According to Section 2 of the Town Planning Ordinance 1919, the general objective of town planning scheme is to secure social welfare of the urban resident’s through proper organization of activities and provision of infrastructure. The section states that: -

“A Town Planning Scheme with the general object of securing proper sanitary conditions, amenity, and convenience in connection with the laying out of land and any other adjoining land may be made in accordance with the provisions of this Ordinance as respect any land which is in course of development or area where in the opinion of the Governor in Council it is desirable that such area shall be re-planned under the provision of this Ordinance or Shall be included in any Town Planning Scheme.”(Legal Notice No. 30 of 1919; East Africa Protectorate, 1920).

Further, Section 3 (1) of Town Planning and Development Ordinance of 1931 -that was meant to amend laws relating to town planning- states that: -

“ A town panning scheme may be made... with respect to any land with the general objective of improving and providing for the proper development of such land to the best possible advantage of securing suitable provision for traffic, transportation, sites for public buildings and purposes, disposition of shop, residence and factory areas, proper sanitary conditions and convenience, parks, gardens, and reserves, and of making suitable provisions for the use of land for building of other purposes.” (Colony and Protectorate of Kenya, 1931).

An extracts from the two legal provisions indicates the acknowledgments that optimization of social and physical infrastructure only occurs in a planning framework which is coordinated. The sections also explains how preplanned model of land delivery optimizes social and physical infrastructure. The findings from this legal guidance are consistent with the infrastructure provisions in the Garden City Model as was championed by Ebenezer Howard as was discussed previously in this chapter of the report (Howard, 1898). The First and Second Schedules of the Two Town Planning Ordinances (1919 and 1931) highlights the matters that are dealt with in Town Planning which entirely describes the provision of infrastructure and the avenues of availing land for infrastructure through compulsory acquisition.

Institutionalization of preplanned development embedded on a land use plan/ town-planning scheme draws from the Town Planning Ordinance 1919, as opposed to the previous years before 1919, where by the preparation of plans for land to be alienated for urban development was not enshrined in law but was at the discretion of the Governor in Council. However, the Ordinance was also borrowing and aligning the land delivery

pathways that were fragmented in the land laws that preceded it. The Town Planning and Development Ordinance, 1931, brought about not many changes. Both ordinances created a preparatory, approving, enforcing authority who also controlled development at the implementation stage to ensure that the welfare objective of the plans are achieved.

Since the Town Planning Ordinances were coming into force when already some areas had been developed as urban, it also gave an appropriate pathway of retroactive provision of infrastructure and order in a plan led development through acquisition and reconstruction. Section 8 and First Schedule of the Town Planning Ordinance, 1919 and Section 4 of Town Planning and Development Ordinance, 1931 outline the contents and matters to be dealt with in a town planning scheme. The contents included redevelopment and reconstruction of land to achieve order and optimize provision of social and physical infrastructure at optimum before reallocation the land back to the owners. In this approach, there is a very rational approach to reconstruct an already developed area afresh as if the plan was being prepared on a green field or virgin land as put forth by Keeble (1983) and Howard (1898). Of course, the executing or enforcing authority was given the power to acquire land that was within the planning area. The power to acquire land made planning very effective since it is with the authority of the government that public interest is a concern.

The improvements on the formality of the land delivery model under the Town Planning Ordinance of 1931 that were not incorporated on the predecessor (Town Planning Act, 1919) were matters to deal with subdivision of land and planning of government land outside an urban area and could possibly be made available for development. Firstly, The Town Planning and Development Ordinance, 1931 prohibited selling or leasing of land for building purposes without the existence of a town planning scheme. Similarly, such development was restricted without a plan even on private land. Section 23 (i) stated that:

“Crown land not within a municipality as defined in Municipal Ordinance or Township Ordinance for which the preparatory authority is appointed shall be made available for alienation for building development purposes, such lands shall not be sold or leased for a period exceeding one year, until the Governor in Council shall have approved a town planning scheme in respect of such land.” (Colony and Protectorate of Kenya, 1931)

Further, Section 24 (1) stated that:-

“... no land within any municipality or township shall, save with the express permission of the commissioner of Lands, to be obtained in every case, and upon such conditions as he may impose, be subdivided or subdivided into lots except in accordance with the provisions of a town planning scheme approved under this Ordinance, or where no such planning scheme has been approved, then in accordance with a scheme of subdivision made so as to satisfy the requirements of the Townships Private Street Ordinance, wherever applied, and with due regard to the suitability of the land for the purpose intended and with reference to town plan or other plan, scheme (not being a statutory town planning scheme under this Ordinance) for control of development, approved by the Commissioner of Lands: the development, subdivision, preservation and/or enrichment of amenities, ... the provision of adequate principal and secondary means of access to subdivision, of adequate open spaces, public and private and of facilities for water supply and drainage.” (Colony and Protectorate of Kenya, 1931)

The quoted clause shows that development on a plain land had to be preceded by planning which allocated land for social and physical infrastructure in a manner that satisfies the public interest. According to section 24 (2) of the Ordinance, if such public interest and welfare indicators were not met, then the Commissioner of land may refuse to approve the subdivision (Colony and Protectorate of Kenya, 1931). With this development path way, it was certain that if such areas emerge as urban they will be having optimal infrastructure provision.

The Town Planning Ordinances gave the Governor the powers to formulate rules to govern town development, further development procedures and conditions were given in the township rules which articulated the development on sites and development of buildings to champion social welfare public health and safety. For example, the Legal Notice Number 111 of 1922 further added the pathways on how development on town plots shall take place including the conditions for building. Among the conditions included restriction of building on a piece of land that that was less than 1 acre and if one was building on an acre piece of land then the ground coverage must not be more than ten percent (10%). It also regulated the sizes, heights of rooms, drainage, and structure of buildings including how the building is coordinated within the neighborhood. The developer was also required to notify the town clerk at every stage of development until completion. At completion, the clerk of the parliament was required to inspect the building to check compliance with the regulations before one was allowed to occupy the building. Even before 1922, the Municipal Ordinance, 1909 allowed the Local Authorities to designate areas for residence for the natives, and they were to compel them to reside in such areas (East Africa Protectorate, 1909; Home, 2012).

Finally, according to the same Government Notice (No.: 111/1922) provision (development) of infrastructure was a responsibility of the local authority (Colony and Protectorate of Kenya, 1922).

From the regulations, it was clear that the local authority was able to control development and restrict densities of development *visa vis* the existing infrastructure that was provided through town planning schemes. It is from this model that Ayonga's (2019) pre-planned model is justified.

Up to 1961, the land delivery model as was embedded in law could be summarized as follows:

- i. Identification of plain land or declaration of an area to be an urban area by the Governor.
- ii. Planning to allocate land for social and physical infrastructure.
- iii. Developing trunk infrastructure such as road and sewer (According to Municipal Ordinance, 1909).
- iv. Alienation of land through subdivision and sale or lease to individuals. The subdivision had to be commissioned by the Commissioner of Lands and approved by him on Government Land.
- v. Enforcement of the special conditions and planning regulation when development of the town is taking place.

The above model strictly considers how land was being availed for urban development. It also shows that infrastructure provision was optimised at the planning stage.

In 1961, Land Use Planning and Development Regulations, 1961 were formulated. The regulations after independence became Land Planning Act, 1968 in the year 1968. In the context of this study, the interrogation of these regulations is based on its provisions, which were the same in pre- and post-independence, except with the amendments to suit the new governance system. In the independent Kenya, the Minister replaced the role of the Governor.

The Regulations (1961) and the Act (1968) did only apply in areas that were specified by the president (Government of Kenya, 1968). Section 2 of the Act states that: -

“These Regulations shall apply to such areas as the President may, by notice in the Gazette, specify.” (Government of Kenya, 1968).

Of course, the Act only applied in the crown land by implication since the planning laws were only formulated for the crownland under the colonial government. Up to 1968, there was no attempt to plan the African villages or residential areas as was done in European towns and rural areas within the crownland. Furthermore, section 10 (1) of the Act stated that: -

“Subject to these Regulations, no person shall carry out development in an interim planning area except with the consent of the authority under these Regulations empowered to grant consent.” (Government of Kenya, 1968).

Further in section 11 (1) stated that: -

“Every person requiring consent for development shall make application to the interim planning authority for the area in which the land concerned is situated or where no such authority exists for the area, to the Central Authority in such form and such manner as may be prescribed and shall include such plans and particulars as are necessary to indicate the intention of the applicant.” (Government of Kenya, 1968).

This legal advisory, further, implied that the act expressly operated on government land where local authorities were established and rural agricultural areas where Central Authorities controlled transactions on land.

The process of providing land for urban development was through town planning or subdivision of land. Borrowing from its predecessors, the Land Planning Act, 1968 made a provision for the preparation of a town plan, area plan and a subdivision and use plan.

The Land Planning Act, 1968 did not provide for the process of establishing new towns but provided for planning of areas by either the Town Planning Advisor, The Minister, or the Local Authority and the approval by the Minister, the Interim Planning Authority, Local Authority, and the Divisional Board. This is according to sections 4 (i), 6 (3), 7 (2), eight. (The provision for approval by several authorities however created ambiguity, as we will discuss in the next section and its effect on the provision of infrastructure). Based on the preceding literature, this act provided the opportunity for optimization of infrastructure provision through a plan.

On matters subdivision of land, which also delivered land for urban development, first, one had to seek consent from the various authorities that included interim planning authority, local authority, central authority, and divisional board who worked in consultation. This is according to sections 11 and 12 of the Land Planning Act, 1968.

The Act ensured that subdivision was based on a plan and where no plan existed, a subdivision and use plan was prepared. The advisory according to Section 15 of the Act required the Central Authority or the Interim Planning authority to:

- i. Be bound by approved planning provisions.
- ii. Consider amenities, health, convenience of the community generally, density and development and land use with proper planning.
- iii. Regard the comments from authorities who the development application is circulated (Government of Kenya, 1968).

Further on the granting of consent, the were the conditions of consent which according to section 16 (2) of the Act stated that: -

“Where in the opinion of the Central Authority or the interim planning authority, as the case may be, insufficient land is surrendered in the application for the purposes specified under regulation 11 (2) of these Regulations or such land is, for any reason, unsatisfactory, the authority may disapprove the application or may inform the applicant that the application will be approved if additional land or satisfactory land, as the case may be, is surrendered:” (Government of Kenya, 1968).

The land surrender according to section 11 (2) are for public purpose which include roads, medical, educational, religious, car park, public open spaces, local government and Government Purposes. The approach was one sure way of optimising the provision of infrastructure in the formal land delivery model as was provided by the Land Planning Act, 1968. When the subdivision was approved, it then followed the registration process according to Crown land ordinance as was previously described or according to the government land Act or Registered Land Act that required application to the Register for approval. The process further required the authentication by the Director of Survey for the transaction to be registered to complete the process (East Africa Protectorate, 1915; Government of Kenya, 2012). This clause applied on government land where subdivision was permitted.

The Physical Planning Act was enacted in the year 1996. The Act repealed the Land Planning Act and the Town Planning Act cap 134, which was Town Planning and Development Ordinance, 1931. The Physical Planning Act Cap 286 was enacted in 1996 and was to apply in all parts of the country including those African urban areas that developed without planning that could optimize infrastructure.

Just like the other previous laws, the Physical Planning Act, 1996 provided for a preplanned model of development regarding subdivision of land. The plan required that all subdivision in any piece of land should be carried out in accordance to the requirements of a physical plan and one had to seek development permission for such development. This requirement was according to Section 41 of the Act (Government of Kenya, 1996). Further, the Act explicitly stated that subdivision and land use plan on private land shall be prepared by a registered physical planner and shall be approved by the director of physical planning. According to 32 (4) of the Cap 286, approval process also required consent of the Land Control Board if the land being subdivided was in agricultural land and required subdivision and change of use. Further, Section 42 (1) advised that: -

“Subject to the provisions of the Government Lands Act (Cap. 280), the Trust Land Act (Cap. 282) and any other written law relating to the administration of land, no subdivision, consolidation, lease or renewal of lease of an alienated Government Land or Trust Land or of a private land shall be effected without due regard being had to the requirements of the relevant physical development plan.” (Government of Kenya, 1996).

The formal preplanned land delivery model is further fixed by the Act empowering the registrar (in Section 37 (1)) to refuse to register any documents of similar development of land only when development permission and necessary consent are granted.” (Government of Kenya, 1996). It therefore, means that for the land delivery process to be complete the process had to follow the advisory and procedure given in the registered land Act of 1963 and Land Registration of 2012.

With the change of the Constitution in 2010, the Physical and Land Use Planning Act of 2019 repealed the Physical Planning Act 1996. The Act simply adopted the provision of the Physical Planning Act of 1996 and aligned the planning institutions according to the provisions of the Constitution, 2010. The Act adopted the incremental approach to the delivery of land for urban development with the approval of land subdivisions being evaluated based on the provisions of an existing plan or a design plan and surrender of land for public purposes. These provisions are according to Section 58 and the Third Schedule of the Act (Government of Kenya, 2019).

The formality in the delivery of land for urban areas in Kenya has also been guided by the Urban Areas and Cities Act (UACA) of 2011 and the Amendment Act 2019. The Act provide for the advisory of conferment of a City, Municipality, Town, or Market status by the relevant authorities. These provisions are according to Sections 5, 7, 9 and 10. The Amendment Act 2019 provide for the delineation of urban boundaries in section 4A to establish the jurisdiction of urban places. Further, in Part III, Section 36 (1) requires the various categories of urban areas to operate within an integrated planning framework which according to sub sections (d) is the basis for provision of social and physical infrastructure. While according sub section (g) a basis for development control.

Finally, in Section 36 (3) the UACA gives the provision for a county to initiate urban planning process for settlements with a population of at least two thousand (2000) residents.

From the forgoing discussion, the model presented by the UACA, despite being formal, is not pre-planned. The Act provides for the process of delineating urban area boundaries but does not address the tenure issues with respect to land that is being brought under urban jurisdiction. Yet the land that is brought under urban development could be private and might have emerged from informal development pathways.

Secondly, the model is selective and exclusionary in shaping the land delivery and development in urban areas. It only provides for planning of urban areas that have a at least a population of 2000 residents and leaves out the emerging urban areas to develop in unplanned manner.

Therefore, it means that the model encouraged by the UACA is unable to optimize the provision of social infrastructure, which this study established to be optimizing

infrastructure through a planning framework at the design stage where land uses are allocated on a plain land (Howard, 1898, Keeble, 1983).

2.6 Development Pathways in the Formal and Pre-planned Model

The laws reviewed in this study indicate a coordinated framework of a pre-planned land delivery model only on government land. These laws included the Crown Land Ordinances 1902, 1915, (which later became the Government Land Act in the independent Kenya), Local Government Act, Land Control Act, Registered Land Act, Township Ordinances and Town Planning Act Cap 134, Town Planning Rules Ordinance Cap 133, and the Land Planning Act Cap 303. These laws consistently create the following Authorities and players:

- i. **An initiating authority-** who decided on the establishment of an urban area or provision of land to be used for urban development. According to the above-mentioned laws, it could be the Governor in Council, Commissioner of lands (in case of subdivision of land) or a land owner on a private land. In the Independent Kenya it was the Minister under the government which later changed to be a Cabinet Secretary (CS) and County Executive Member under the County Government in the New Constitution (2010).
- ii. **Preparatory authority-** who is given the power to prepare a plan to allocate land for infrastructure also articulated as public purpose among other land uses. From the review presented, it could be a town planning advisor, the minister, the local authority, the Commissioner of lands (on subdivision of Government Land) or an Interim Planning Authority. In addition, the Director of Physical Planning or County Director of Planning (according to the Physical Planning Act Cap 286 and the Physical and Land Use Planning Act, 2018).
- iii. **Approving authority-** who according to the colonial government included the Governor in Council, the Legislative Council, the Commissioner of Lands, Lands Officer (in Crown Land Ordinance, 1915), Local Authority, Interim Planning Authority, Central Authority, Land Control Board, Director of Physical Planning, the Minister/Cabinet Secretary and Currently the County Executive Member in charge of Lands and Physical Planning or County Assembly.

In land subdivision, the subdivision had to be certified and counter certified by the Government surveyor or a licenced surveyor and the director of survey before the transaction relating to transfer or transaction is registered by the registrar.

- iv. **Enforcement authority-** Who according to the Crown Land Ordinance 2015 was the Governor, council (for a county, municipal, township), Interim Planning Authority, Local Authority, or the County Government in the current legal dispensation.

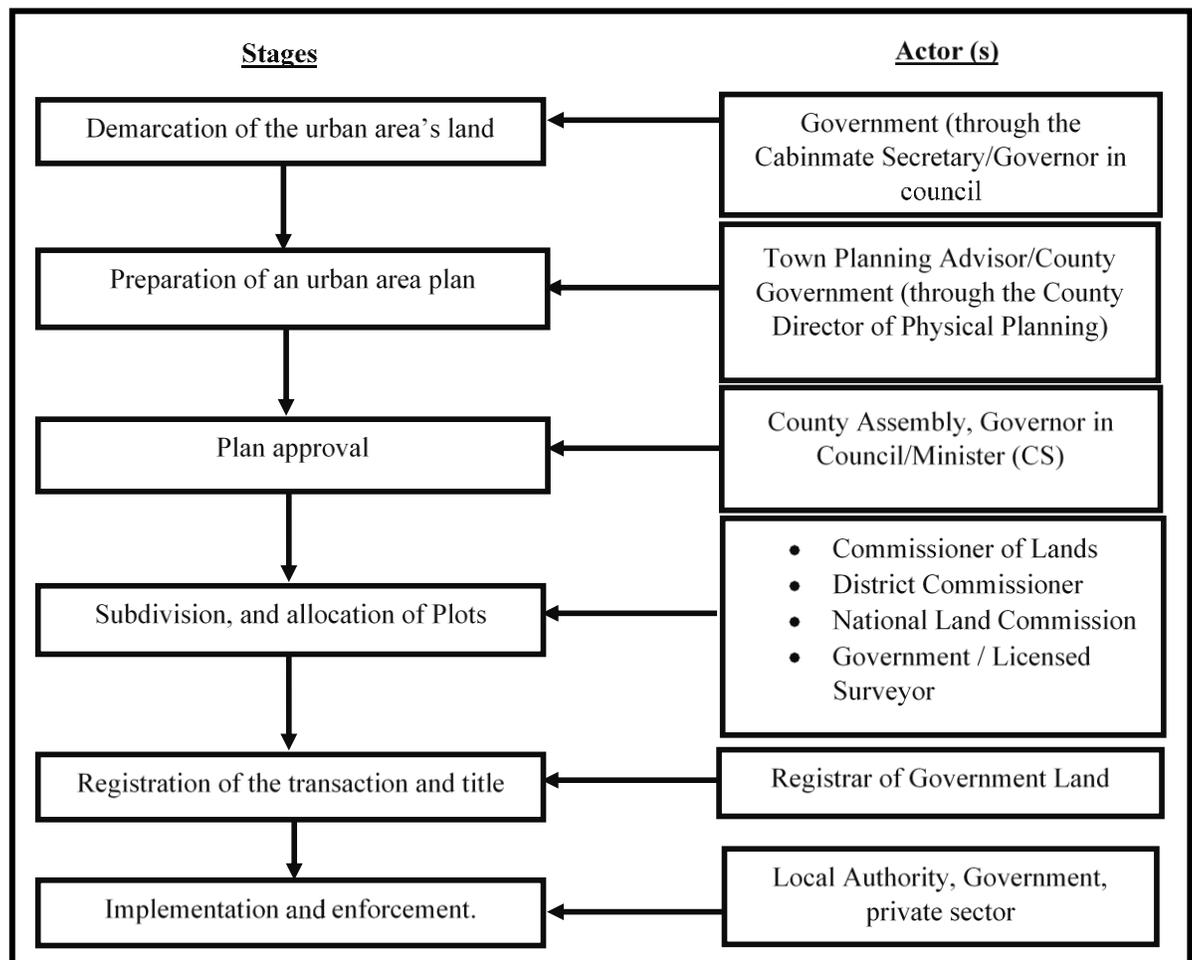
When land was delivered holistically within an urban planning framework, infrastructure and public purpose was first optimized according to the planning and development standards. The land was then alienated for commercial and residential development to individuals and corporate bodies to invest. This process was complete when the registrar registered the documents relating to the transfer of the land under lease or sale of land.

Similarly, when private land sold out from the crown land was being subdivided, it had to follow the formal process and had to be registered for the process to be complete where new title as issued to the land with the use described in the title.

The development pathways can be summarized as follows:

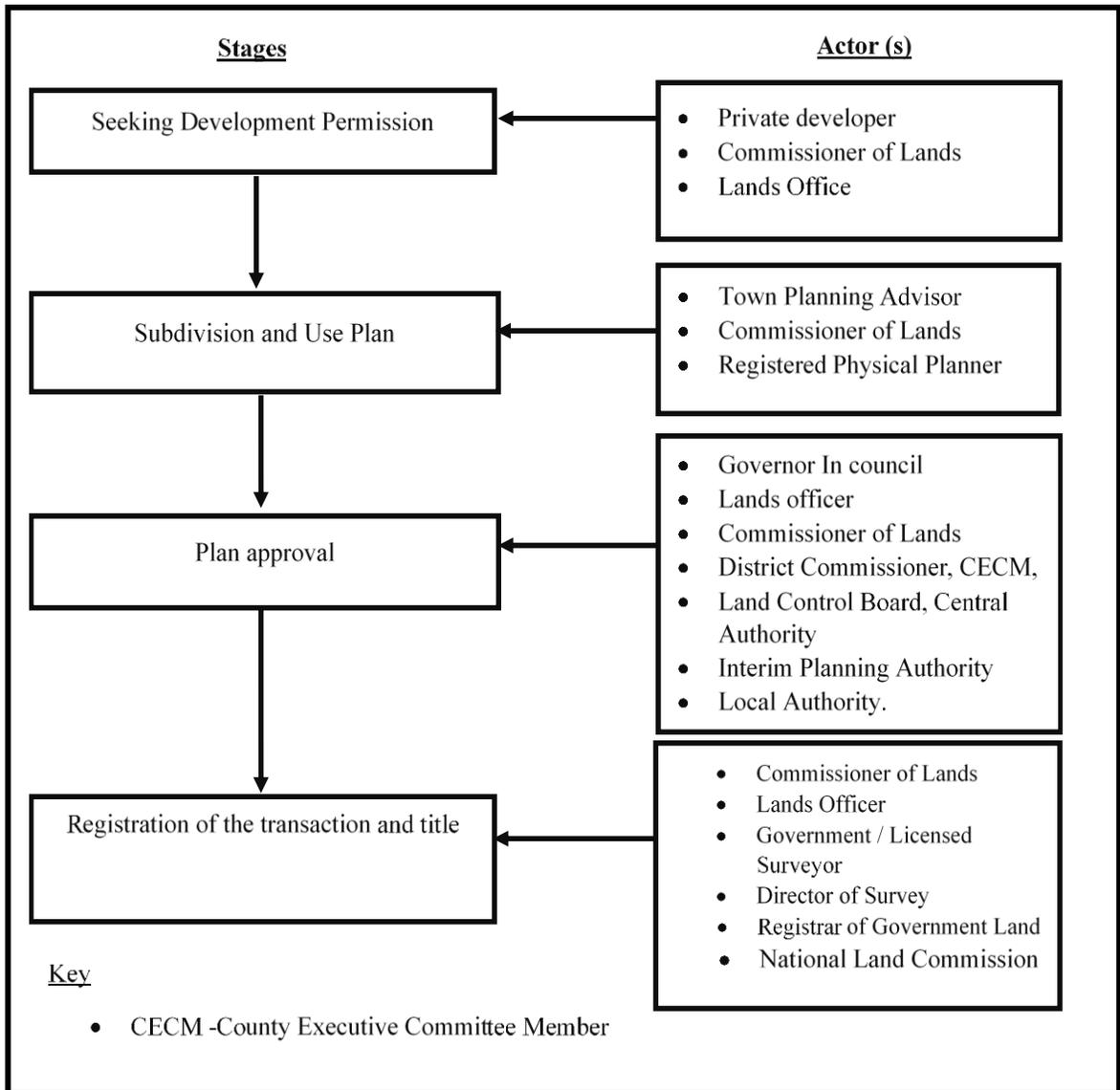
- a. Holistic urban development (Government initiated).
Demarcation of the urban area boundary, preparation of an urban area plan, Plan approval, subdivision, and allocation of land for residential and commercial of the allocation of plots, registration of the transaction and title implementation enforcement.
- b. Incremental delivery of urban land through subdivision and change of use (Developer initiated).
- c. Application for development permission, preparation of subdivision and use plan, seeking consent, approval of the subdivision and use plan, survey and authentication of the drawings, application for registration and issuance of title.

Figure 1: Government's Formal Preplanned Land Delivery Model (Ideal)



Source: Authors, conceptualization, 2021

Figure 2: Formal Incremental land Delivery Model (developer initiated)



Source Author's Conceptualization 2021

It is evident that these models were based on the colonial/government land as was founded on colonial land and planning law, rules, and regulations. These laws applied on government land up to 1996 when Physical Planning Act Cap 286 was assented and later or came to effect in 1998. The Physical Planning Act nationalized the development rights by requiring all developers to seek development permission whether on government land or on trust /community or private land (Government of Kenya, 1996). Furthermore, when the land laws were harmonized, rationalized, and consolidated as advised by Article 68 (a) of the Constitution of Kenya, 2010, the Land Act, 2012 was formulated. The Land Act directed “that no government land shall be allocated without planning, survey, servicing, and attachment of development guidelines” (Government of Kenya, 2012). This is according to section 12 (7) that states -

“Public land shall not be allocated unless it has been planned, surveyed and serviced and guidelines for its development prepared ...” (Government of Kenya, 2012)

Further, Section 12 (8) prohibits the selling, disposing, sub-leasing, or subdivision of public land in contrary to the purpose to which the land is allocated (Government of Kenya, 2012).

In addition, the tenure system within which this model was able to work was a leasehold tenure where land rights and interest were based on the extent to which the special conditions of lease or sale were attached to the conveyance and leases. The conditions had to be met and if development did not comply with the terms and conditions, the land had to revert to the government or one could be sued or penalized (East Africa Protectorate, 1915; Government of Kenya, 2012). In essence, the model on the government land predetermined the use of land and provided regulations that determined density, building conditions and access to infrastructural services. It controlled development. This is evident in Section 12 (9) of the Land Act, 2012 that states -

“Where the land allocated under subsection (8) is not developed in accordance with the terms and conditions stipulated in the lease, that land shall automatically revert back to the national or county government, as the case may be and the Commission shall include in its annual report the status of implementation of this subsection.” (Government of Kenya, 2012).

The government led model presents the ideal land delivery model that optimizes the provision of infrastructure that is coordinated through planning and effected through implementation and enforcement.

2.6.1 Sub-Model in the Semi-Formal Land Delivery Models

The Trust Land Act, 1939, Cap 288, the Independence Constitution of Kenya 1963, Land Control Act, 1967 and the Local Government Act Cap 265 have also created a model which is formal according to the law but is unplanned and hence the resultant effect is non-optimal. Planning activities did not occur in the African Native land and yet the periodic markets slowly grew into urban areas. The Authority that was responsible for developments on the African land was the Native Trust Board that was permitted to lease Native land in the interest of the colonial government (Smith, 1936).

The independence Constitution of Kenya, 1963 vested all the trust land on the County Council in the independence Kenya (Article 208 (4)). According to Article 208 (5), the county council was to hold the trust land for the benefit of the local residents in accordance with the African Customary law and to give effect to such rights and interests of the tribe family or group (Government of Kenya, 1963). The trust land did not benefit from planning provisions of the colonial laws and so there was definitely limited provision of social and physical infrastructure. The Constitution under, Article 208 (7)(a) and (c) further gave the county council the powers to set apart trust land for land for use and occupation by public body or public authority for public purpose and by any other person for any other purpose that is of benefit to derive revenue and rent (Government of Kenya, 1963). This process, according to the Constitution, was supposed to be informed

by the laws made by the Regional Assembly within which the county council's jurisdiction rests.

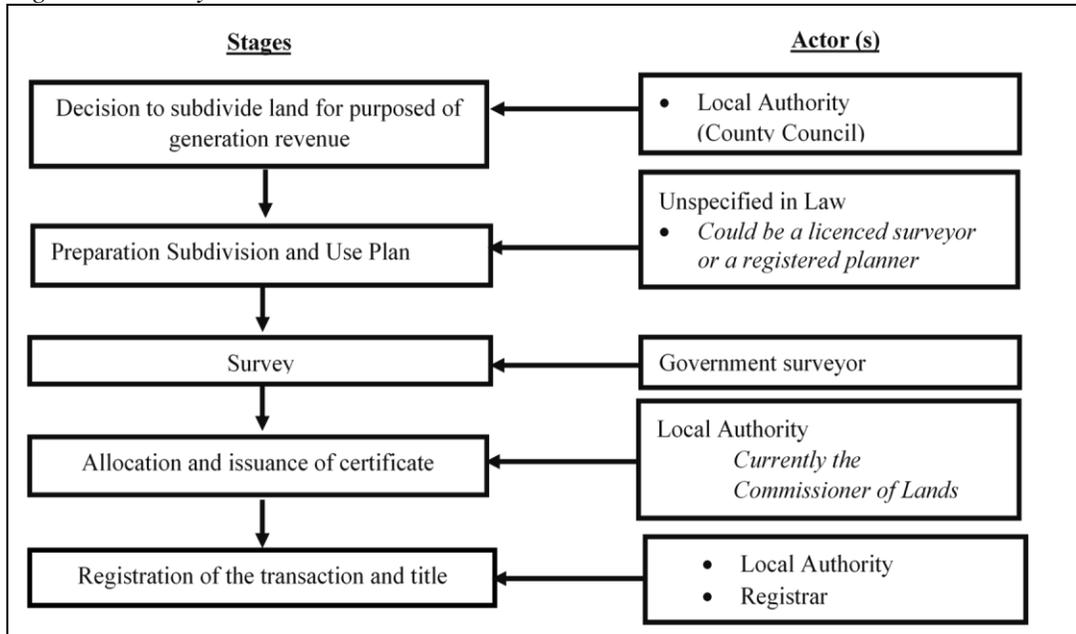
According to Section 217 of the independence Constitution (1963) there was the establishment of Divisional Land Control Boards to control transactions on land of which land subdivision is part. Since land subdivision is a major contributor of land for urban development, the Constitution (1963) advised that no party should be part of land subdivision or partitioning of land to be owned under different titles without the consent of the Divisional Land Control Board. This directive was according to section 218 (1). The Land Control Board was given the authority to consider development applications for consent. Further, Land Control Act, 1967 was formulated and assented to effect article 218 of the constitution (1963) on controlling transaction on agricultural land. According to Section 6 (1) (b) of the Land Control Act Cap 203, the Act purely applied on trust land and private land and did not apply on Government Land where Land Planning Act, 1968 applied (Government of Kenya, 1967).

On the other hand, the Local Government Act, 1963 gave the local authorities the power to “subdivide, sell or appropriate the land under its possession to any person or for its own use for purposes of industrial business, workshop use or any other use” (sections 144, 145, 177) and to control such development (section 166). Meaning the local authorities (county council) would deliver land from urbanization in that manner (Government of Kenya, 2010). If this was government land, it required the approval of the commissioner of lands as was seen in the formal government led model (East African Protectorate, 1903; East Africa Protectorate, 1915; Colony of Kenya, 1947; Government of Kenya, 2010)

To complete the process, the Constitution (1963) provided for the registration of trust land to be guided by existing laws among them Land Registration (Special Area) Ordinance and the Registered Land Act, 1963 (Government of Kenya, 1963). Later with the effecting of the Land Control Act, 1967, the registration had to be done with respect to only those land transactions, which Consent of the Land Control Board had been given [section 20(1)].

From the foregoing discussion, two urban land delivery sub-models emerge. The first model is initiated by the private developer (s) and consented by the Land Control Board approved by the local authority (county council) and registered by the registrar with respect to adjudication areas. the second sub-model is initiated by the county council and register by the registrar

Figure 3: County Council Semi- Formal Model

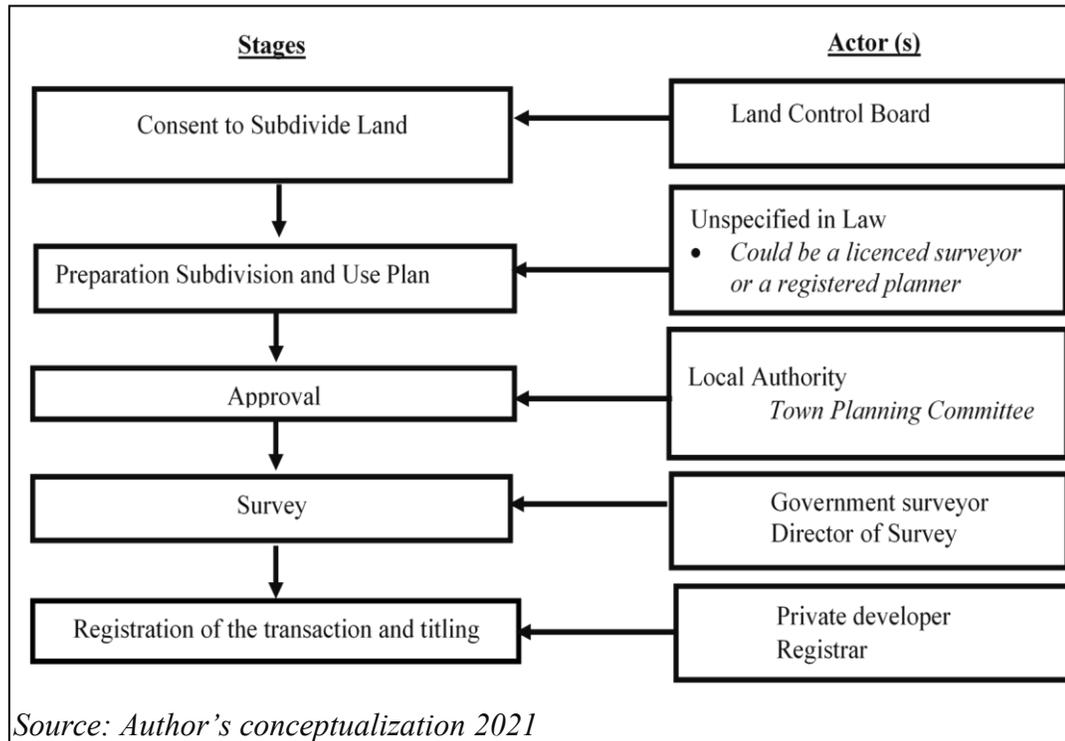


Source: Author's conceptualization 2021

The sub-model presented in figure 3 (County Council Formal unplanned) above emanates from two development initiatives. The land which the local authority (county council in this case) can purpose to subdivide can be that which it acquired according to section 144 of the Local Government Act Cap 265, it could also subdivide that land that is registered under it or that land which is surrendered from subdivision of freehold land in an area within its jurisdiction. All these lands when delivered they follow the model presented in figure 3. Conceptually, the model is branded unplanned in this study since the law that guided the planning of trust land until 1996. In contrast, the county councils were expected to regulate development according to Section 166 of the Local Government Act Cap 265. Legal advisory made development control discretionary and has remained so in most of the areas that have developed without a planning framework. On the same obligation, the county councils at times opted to prepare plans which were not approved and if they were to be approved the approval was done by the Minister in charge of local government. Therefore, the development pathway that was adopted by the local authorities to govern development and delivery of land was from the laws that were developed to guide delivery of land in government land. However, these laws since they were not binding to the local authorities, they were applied selectively when they favored the development proponents.

Private land that boarded urban areas or those that were in urban fringe were also delivered for urban land use through subdivision and change of use. According to the laws that existed before 1996, i.e., Trust Land Act, 1939, Local Government Act, Registered Land Act, 1963 1963, Land Control Act, 1967 the delivery model is conceived as presented in figure 4.

Figure 4: Developer's Semi-Formal Model



The two sub-models of Semi-formal as presented in figure 3 and 4 are guided by fragmented laws and discretionary development control decisions that are not founded on a plan. According to literature reviewed in this study and planning law, development control is supposed to be undertaken on a basis of an approved plan (Colony and Protectorate of Kenya, 1931; Government of the United Kingdom, 1947; Mwangi, 1994). It is evident that within the development pathways provided by the two semi formal models there is no stage which a coordinated development and optimization of infrastructure is done. The objective of the delivery and transaction on land is to maximize return from the land that is being availed for development. Since this study confirms that pre-planned development optimizes infrastructure provision, the emerging urban development will definitely be deficient in infrastructure provision.

Deducing from the model presented in the works of Howard (1898) and Keeble (1983), the preplanned development optimizes infrastructure by first considering the population that is supposed to occupy the land that is being availed for urban development. With the knowledge of the population, the infrastructural needs are predetermined and the density is determined and controlled.

The plans that were prepared under the colonial government were guided by the town planning ordinances, rules and regulations, which had to be complied with before they are approved. On the contrary, the plans that were prepared under the semi-formal models were either focused on an individual's land or were prepared according the interests of the county council and were not bound by the Town Planning Act Cap 134 and Town Planning Rules Ordinance Cap 133. They were used mainly for purposes of allocating land. Due to this phenomenon, the land that was allocated for infrastructure was limited since the infrastructure is provided in the public interest and was not meant to for profiting the developer. Infrastructure (physical and social) was not as profitable as other land uses such as residential, commercial, or industrial.

Therefore, if the objective of these plans prepared under the semi-formal model was to allocate or deliver land then the social welfare and public interest was not a priority and so the economic forces definitely domineered public interest, which should be championed by plans, and planning (Chapin & Kaiser, 1979; Healey, 1983). Additionally, the incremental approach to deliver land for urban development that takes place through the land control board and the private developers has no capacity to provide all sets of social infrastructures. When land is being surrendered through this process, small-scale subdivisions i.e., the subdivision of five acres of agricultural land cannot avail land for all sets of infrastructural requirements in an urban setup. Secondly, the population to be settled on the land is never predetermined. Finally, the law that guided the approval of land surrender that was being applied (though not explicitly applying to the trust land) in the process restricted the approving authority to approve the subdivision if the developer surrender twenty percent (20%) of the land for public purposes (Government of Kenya, 1968).

This complexity in law and ambiguities in the development pathways on trust land should explain the deficiency and non-optimal provision of infrastructure in the semi-formal (unplanned) model.

Residential development, characterized by housing is a major consumer of urban land and a major driver of urban land that triggers the demand. Due to housing and infrastructural needs in urban areas, cooperatives have been in the forefront in providing decent housing condition. Cooperative (despite being considered private developers and so fitting in the private developer's formal model) have modified the land delivery model championed by the private sector to optimize infrastructure provision for its members (Cooperative Housing International, 2020). With the establishment of National Cooperative Housing Union (NACHU), the cooperatives made improvement on the model by introducing planning of the land to suit the interest and welfare of its members. It therefore, optimized the provision of infrastructure on land that was set aside for housing development of its members. This model borrowed from the formal preplanned development model though operated within freehold land.

Recently, private investors have also established the need for optimum infrastructural provision commensurate to the needs of the population targeted by such developments. In Kenya, development in the new name "... City" for marketing purposes is the new approach to incremental delivery of land to the urban areas or for development of totally new urban places with the tenure system being on lease. Such case examples include the

Garden City, Tatu, City, Tilisi, Konza City and North Lands City, which are currently under construction in Kenya.

Despite the above modifications on the private developer's unplanned land delivery model, the public is excluded from the infrastructural provisions that emerge from the cooperatives and private (companies) developers' model. These modifications are therefore exclusionary and leave out the public.

2.7 Distortions of the Formal Preplanned Model and Impact on Infrastructure

Broadly, as presented in the discussion that proceeds this section, there are the formal preplanned model and the unplanned model. Planning law recognizes the danger of loss of the order and welfare and enhancement of public interest when development takes place as urban areas grow. It is on this basis that planning and control of development are tied together. Lack of proactive planning and firm development control results in distortion of the preplanned development model (Pounds, 2005). In the long run infrastructure provision becomes inadequate.

The medieval cities were distorted when the population grew without a planned expansion to effectively provide infrastructure (Pounds, 2005). At the same time as the urban areas grew; they merged with those settlements that were unplanned but existed outside their boundaries (Pounds, 2005; Elmqvist *et al.*, 2013). The emerging urban areas had dual nuclei with one formal development that emerged from the unplanned model while the other nucleus was unplanned because it emerged from organic development. Since urban growth was and is still relentless, the holistic outcome of the development was an urban place, which has inadequate provision of infrastructure.

Similarly, in Kenya, all the urban areas that emerged from the preplanned development model faced distortion similar to that, which was experienced in the medieval cities. When urban areas such as Nairobi, Mombasa and Kisumu overgrew their boundaries, the colonial government was concerned and had to reconsider extending the urban boundaries subsuming the African settlements that were outside their boundaries and grew organically (Home, 2012). At the same time, the land tenure of the African settlements was freehold.

The native settlements developed organically as the customary laws drove them. However, the informality in land delivery and inadequate infrastructure provision inherent in urban areas draws their origin in the European land governance laws and the principle of segregation. Since the natives were not allowed to reside in towns, except for the workers who were permitted to live and work in towns, they lived outside the established towns' boundaries. This was influenced by the fact that the natives sought employment in the settlers' areas, so they prefer living near the white settlers' area. The relatives and the families of the workers move closer to their loved ones in towns by residing in the settlements beyond the township boundaries.

In as much as the urban areas that were created by the colonial government were planned, it was only those areas that the whites lived that were planned and infrastructure provision optimized (Home, 2012; Ayonga, 2020). The Sanitary Report of 1907 by Bransby

Williams from the evaluation of Kisumu Township in Kenya revealed that the white highlands were well planned with low densities per unit area with adequate public sanitary infrastructure provision. While the Asian enclave was so dense with small plots of below an acre with latrines, washing places, and kitchen within the same houses (Home, 2012). He blames the unsanitary conditions of the Asian bazaar on the authorities who allocated the plots and implemented such kinds of developments. The report also outlines the living condition of the native police who were permitted to live in the townships to have been totally built up without spaces and inherently lacked social and physical infrastructure.

Bransby's report reveals informality within a formally conceived urban development with land delivered in a preplanned manner in Kisumu. Bringing a new dimension, which is a potential factor to interrogate within the preplanned land delivery model. The "implementation" of planned land use allocation within the ideal urban land delivery model. From his findings, he made meticulous recommendations specific to the various segregated zones within the township, including removing the lavatories, kitchen, and washing places from the house to the backyard within the bazaar as fencing increasing the landholdings. On the African enclaves, the recommendations included sanitary conditions that tactically entailed establishing a layout of alternate squares with the huts occupying each square, and the alternate square is anticipated to be occupied when the first square becomes foul. He further recommended specific densities of two hundred (200) acres for then thousand natives (10,000) with a density of 100 units per acre (Williams, 1907). However, there were no recommendations on the provision of physical and social infrastructure in the natives' settlement area. It therefore, shows that the Natives areas were unplanned even within the townships created by the colonial government, which emerged from formal preplanned development model.

Formally, the formal preplanned model of urban land delivery first drew legal mandate from the formulation and passing of the Town Planning Ordinance of 1919 as previously discussed. However, the ambiguity that was later created by the planning regulations from 1960s are also to blame for the distortions to the formal land delivery models. The obliterating of Town Planning Rules Ordinance Cap 133 created an ambiguity in the formerly coherent process of formal land delivery (Ayonga, 2020). In the independent Kenya, the Land Planning, 1968 and the Town Planning Act Cap 134 created parallel plan preparatory authorities and approving authorities. The Land Planning Act Cap 303, created an interim planning authority who could prepare, approve, and implement plans, it also gave the land control board, the local authority, and the minister the mandate to approve land subdivision. It was quite unclear who was the overall authority in furthering and shaping the formal land delivery model within the provision of the Land Planning Act, 1968. Since it was not mandatory under the Land Planning Act, 1968 that the subdivision and use plan was only supposed to be prepared by a town planning advisor as was in the Town Planning Rules Ordinance Cap 133. Schemes prepared by the surveyors could be registered by the registrar provided they were approved by the Land Control Board, the Local Authority (who had no adequate capacity at independence) and signed by the director of survey. Within this confusion and ambiguity, the town planning advisor (physical planner) could easily be bypassed in the development process and the development be ratified as formal and legal. Eventually this process delivered land for urban development without optimization of infrastructure (Ayonga, 2020).

Like Europe, the influx of people into the urban areas in Kenya caused failure into the pre-planned urban land delivery model. During the pre-colonial and colonial periods, the growth of these urban areas was not alarming compared to the post-independence period. In the colonial period, the Colonial administration restricted Africans' movement into the urban areas and this had some control on urbanization. The demand for land for urbanization quickly rose after independence when the ban on African movement to the urban areas was lifted. The urban areas have since overgrown the planned boundaries demarcated in the colonial period and, hence, the private sector's opportunity to deliver land for urban development to meet the inherent urban land needs. The government has been in the system to meet the demand, but the rate at which urbanization takes place is not commensurate to the rate at which it is delivering land for urban development.

A preplanned model's failure in a citywide or urban wide development failed as an initiative by the leadership/governance. However, what has emerged are two approaches to address the deficiencies of the development models that have emerged from the distortions of the formal preplanned model of urban land delivery. The first approach borrows from Ebenezer Howard's social city development approach of the New Town development that applies in Kenya and globally (Howard, 1898). It is also true to note that the new town development as an approach to delivering land for urban development in a pre-planned manner is quite expensive, and the proponents have largely been the private sector developers. When conceived by the government, the process often exhibits untimely and ineffective implementation schedules. For example, the Konza Techno City conceived by the Government of Kenya in 2008 under the vision 2030 has not achieved thirty percent (30%) implementation eleven years later (Konza Technopolis, 2019). The second approach is through site and service schemes championed by World Bank in 1972 to try to solve urban challenges in Africa (Mabogunje, 1990). This theoretical understanding in planning is an incremental approach to solving urban challenges as advanced by Charles Lindblom (1959). The approach is not quite similar to the previous models as it only addresses planning dilemmas in a piecemeal manner. The defunct Government Land Act Cap 280 (1984) that outlined the procedures of developing government land that is allocated through a lease has also supported this model.

The Government Land Act Cap 280 (1984) compelled developers to sign an agreement that they would undertake development on the land according to the planned land use regulations. Development had to be inspected to ascertain the level of compliance before the occupation certificate was issued. What would be termed as formal urban land delivery in a pre-planned model takes place incrementally in our urban areas championed by the real estate developers in the private sector. In such instances, provision of infrastructure is at the mercy of the investor motivated by profit and not uphold social welfare as it would be in a public entity.

As more development guidelines were being based on the legislation frameworks, it was never mandatory that an area should be planned first before it was occupied. It is a gap in the legal framework that has been carried forward by successive legislations that guide planning in Kenya.

In the year 1996, the Physical Planning Act of 1996 (Cap 286) repealed both the Town Planning Act, Cap 134 and Land Planning Act, Cap 303. The Physical Planning Act harmonized the two preceding statutes mentioned above as well as harmonizing the

powers and the institutional mandates of the planning authorities. Interesting to this study, the Physical Planning Act, Cap 286, built on the foundations created by the previous land and planning statutes. The Act, therefore, advanced the mandate of the planning and implementation authorities to plan and regulate development on both governments, community and private lands (settled areas and native reserves in the former legal dispensation). Within the context of the Physical Planning Act of 1996, planning was to champion public interest and welfare across all scopes of land tenure. It is within this context that all the development plans were formulated and vetted.

The physical planning Act Cap 286 was superficial as far as the planning of private land is concerned. The plan did not address how to authoritatively plan private land which to some extent had developed informally. Further, the act did not address the tenure issue, which was clear under the colonial laws. The tenure system in urban areas was lease hold and this enabled the planning authorities and the enforcement authorities to plan and enforce planning recommendations in urban areas since the lease had conditions which were a covenant between the authorities and the developer. How then was the Act going to champion public interest on private land?

What then emerged from the advisory of the Physical planning Act Cap 286 was that the local authorities and currently the counties, undertake development control in private land that is unplanned, and without a documented and approved planning framework. This is ideally formalizing the informality that existed in these areas. The action is also contrary to the planning laws that dictates that development control is embedded on a physical development plan (Ministry of Housing and Local Government, 1947; Mwangi, 1994).

With the promulgation of Kenya's new Constitution in 2010, the Physical Planning Act, 1996 experienced a lot of inconsistency from the governance system to the authorities mandated to do the plan, including the constitutional recognition. The statute was, therefore, repealed by the Physical and Land Use Planning Act (PLUPA) of 2019. This Act also carried forward the challenges of the Physical Planning Act Cap 286.

The dilemma still remains on how the planning laws shall facilitate public interest and welfare on private land. Contrastly, there is a stiff competition between public purpose and private development. Land use allocation often take place by two critical forces. The first force is the market force, while the second force is design (Chapin & Kaiser, 1979). The inefficiencies in the market system necessitates the need for land use planning to minimise the impact to the market forces that characterises the informal/ *laissez faire* land delivery model (Chapin & Kaiser, 1979). It is for this reason that planning is done in the public interest.

2.8 Urban Land Delivery Models and Provision of Physical and Social Infrastructure

Physical and social infrastructure plays a fundamental role in urban development, without which no progress can occur (Porter, 1986). Calderón and Servén (2010) have seen infrastructure as an equalizer that brings parity in social inequality. Similarly, infrastructure is a determinant of citizens' quality of life (Yazdani et al., 2015). In this study's opinion, infrastructure would be described as the indicator of social welfare and

public interest. Donald McAllister (1980) and Foley (1960) refer to the public interest or social welfare as the means that citizens need to satisfy their social life, which reaffirms this discussion's position. All the literature is reviewed in this study reemphasizing the importance of infrastructure in urban development. The two major models discussed in this study have varied implications on physical and social infrastructure provision. In this section of the discussion, these models are evaluated based on how they impact physical and social infrastructure provision in urban areas.

2.8.1 Preplanned Model and Provision of Infrastructure

The pre-planned urban land delivery model is a coordinated development approach to vailing land for urban development. It is a development process that follows a logical and rational order of realizing urban development. Within this model, land use allocation is guided by laws and policies. The allocation is also done on the land that has been delivered for urban development in the planning stage (Government of Kenya, 2008; Government of Kenya, 2019). The land-use allocation for social and physical infrastructure in this model is based on planning standards and norms that ensure effective distribution and efficiency in service provision in urban areas (Governemnt of Kenya, 2008).

The preplanned urban land delivery model allows for a coordinated development of infrastructure with a city/urban wide view and vision that translates into an orderly development. This approach has been viewed by Williams (2014) as rational, ‘predict and provide an approach that he says “has worked relatively well and delivered: decent homes for the majority of the population; well-connected settlements; buildings for economic activity; land for leisure; agriculture and landscape purposes; and infrastructure to keep society functioning” (Williams, 2014). Planning is always based on projections into the future and deciding how people will live. Therefore, a pre-planned urban land delivery model consciously promotes social welfare and livability in urban areas as it ensures that every population need in terms of infrastructure is catered for in development. On this backdrop, it is evident that preplanned urban areas will always incur a cheaper cost of laying infrastructure since way leave/ land acquisition is never part of the infrastructural development project. Experience has shown that the quality of life in planned urban areas with effective implementation is higher due to efficiency and service provision effectiveness. This proposition has been reaffirmed by the findings of researchers (Yazdani et al., 2015). Furthermore, Obegbulus and Adewunami (2009), in their works, argue, “the difference between slum dwellers and non-slum dwellers is determined by the level of provision of social and physical infrastructure” (Yazdani et al., 2015).

2.8.2 Informal Urban Land Delivery Model and Provision of Infrastructure

When an urban area emerges informally/organically from land subdivision and conversion of use, the model with which the urban land is delivered is referred to as an informal model or build and occupy model (Ayonga, 2019). In such a circumstance, the urbanization process is driven by piecemeal development, which incrementally culminated into urban development. Informal urban land delivery model has been associated with deficiencies in the provision and distribution of social and physical infrastructure (International Labour Organization, 2008). Due to the lack of a holistic approach to land use organization and needs identification at the initial stages of urban development, the land is not set aside for infrastructural development. Instead, the

developers focus on doing private development. Infrastructural (development) that is public good do not compete favorably with such private investments. It also makes sense from an economic perspective that investors would only put their money where returns and profit will be achieved and not the opposite. On this basis, land supplied for urban development in the informal model mainly involve investment in private goods that are exclusionary.

Urban areas that have emerged on land that is not formally delivered tend to mainly have road networks that sometimes are not graduated or classified based on planning standards and norms (Li *et al.*, 2018). Additionally, these urban areas tend to have the bare minimum such land surrender that is mandatory in law and accessibility to plots/properties, which is mandatory in land subdivision (Government of Kenya, 1968; 1996). Thuo (2013) points out that “with an unfortunate aspect of uncontrolled land subdivision for residential purposes in the rural-urban fringe that are not backed by corresponding investment in social and technical infrastructure or services is that they cannot attract investment in the production sector.” The resulting situation is chaotic and compromised quality of life in these areas due to inadequate or long distance in accessing services such as recreation, schools, health, solid waste management, and poor liquid waste management and stormwater drainage outflow infrastructure (Thuo, 2013).

Finally, the *laissez-faire* model of urban land delivery, as discussed in the previous sections of this discourse, presents the deficiencies in social and physical infrastructure associated with urban areas that have emerged without planning. The historical tracking of urban land delivery shows that not all the arrays of necessary infrastructure that constitute public interest are considered in the *laissez-faire* urban land delivery model. Additionally, the standards of the selectively provided infrastructure are compromised. The resultant wholistic outcome is what Hall (1999) refers to as a “pathological city.”

2.9 The Neighborhood Concept

Neighborhood concept has been used as a way of reorganizing settlements in urban areas to ensure convenience, and welfare of urban residents. According to Gallion (1950), a neighborhood is an identity of an area that assumes homonymous quality. Whittick (1974) described a neighborhood unit as integrated and planned urban place that consist of a residential district, a shopping center, school or schools, open spaces, religious buildings and a sometimes a degree of service industry (Whittick, 1974).

Neighbourhoods have their population predetermined. For example, Clarence Perry in 1929 described the physical neighborhood to be an area where services such as shopping center, elementary school, secondary school are within one and half mile radius (Gallion, 1950). Further, it was outlined that within the neighborhoods, 10% of the land was allocated for public open spaces, and there were public facilities such as library, community center, and churches that served 10 families per acre with a population threshold of between 5000 to 6000 people (Gallion, 1950). The key principles of good neighborhood design according to Perry included the following (Meenakshi, 2011):

- i. Major arterials defining the boundaries of the neighborhood and not passing through the neighborhood.
- ii. *Cool de sac* used to characterize the interior streets with low volume traffic.
- iii. Elementary schools are supported by the population of the neighborhood.
- iv. The elementary school is the focal point of the neighborhood

- v. The maximum radius of the neighborhood unit to be not more than one quarter mile precluding a walk of more than that distance for any elementary school child.
- vi. Siting of the shopping district to be at the edge of the neighborhood at a major street

The neighborhood units are the building block of an urban system within which infrastructural services are within reach. It offers safety and security for school going children in that they do not need to cross-busy streets as they get to school (Gallion, 1950). Similarly, it is a planning concept that enables provision of social and physical infrastructure at optimum with controlled density and predetermined population. This concept is key in informing examination of the level of service provision in the various land delivery models that have contributed to urban development processes. With the neighborhood background, the land delivery models can be interrogated if they create neighbourhoods and optimize infrastructure provision.

2.10 Measures to Mitigate Non-optimal in Infrastructure Provision

The model in which land is brought in for urban development presents various challenges related to infrastructure provision and the general livability in urban areas. The challenges are more inclined to the informal urban land delivery models. However, it is prudent to explore the interventions that have been adopted to enable urban areas to cope with their situations. The alternatives that have been explored in this work include land readjustment, new town development, sites and service scheme approaches to addressing urban land development challenges.

2.10.1 Land Readjustment

The land readjustment (LR) mechanism has been identified as “one such land assembly tool, which many countries, including Japan, have adopted, and is known as the Town Planning Scheme (TP Scheme) in India” (Vihbu, 2019). This is the concept of replotting or reshaping a parcel of land to develop it with amenities and services, such as roads, parks, social infrastructure, and utilities (Vihbu, 2019). As a planning principle, land readjustment enables the pooling of various privately owned land parcels by the government within a given locality and preparation. While preparing the land use plan for the area, the designation of spaces for public infrastructure and services is undertaken. While implementing the plan, the government provides trunk infrastructure. According to World Bank (2015), “at the end of the process, the government returns to each landowner a land parcel proportional to their original parcel but of smaller size (for instance, fifty to sixty percent [(50%–60%) of the original land parcel] except that the new land parcel is of a higher value because it is now serviced urban land” (The World Bank, 2015).

City Boulding (2015) observed that “Global urbanization not only generates wealth and prosperity but also places pressure on the supply of serviced land which is required in order to sustain processes of planned urbanization.” City Builders further underscored that “since large tracts of peri-urban land are within the control of a few individuals, traditional families and real estate market stakeholders, urban managements are compelled to engage with private landowners to provide housing and urban services to its growing populations” (City Boulding, 2015). This discussion's opinion is that land readjustment can be applied in Kitengela to champion public interest. However, it is an

expensive method since it requires demolition in some cases, which do not come with compensation.

2.10.2 New Town Development

The concept of the new town, in theory, has been construed as development outside the existing large urban areas. It is described as a creation of new communities (Encyclopaedia Britannica, 1998). Underscored by the authors in Encyclopaedia Britannica, the concept of new towns was first proposed in the British's New Towns Act of 1946 to guide in the reconstruction after World War II. However, this study's standpoint reveals the concept of a new town earlier than the time put forth by the authors, as mentioned above. It is a concept that is seen in the emergence of the Garden city movement. In this concept, Sir Ebenezer Howard gave a proposition of addressing the problems of the industrial cities by developing the so-called social cities that had defined land size of 6000 acres with a population threshold of 30000 in the town and 2000 people in the Agricultural Units (Howard, 1898). It is also worth noting that the concept developed in the late 19th Century by Howard later informed the reconstruction of Europe and was, therefore, proposed to be given legal backing in law in Britain.

As mentioned earlier in this work, the efforts to address the shortcomings of informality related to land delivery and social challenges, Howard (1898) gave a very meticulous and medicinal dosage to cure the industrial cities in the new town development approach in the form of the garden city. Howard recommended the acquisition of agricultural land and drew a detailed plan that organized land uses that integrated economic, social, and physical infrastructure in a manner that raises the standard of health and comfort of all the residents (Howard, 1898). In this concept, there was a balance in the distribution of infrastructure- social and physical- in the municipal land that was formally delivered for urban development. Ebenezer Howard provided parks at various intervals to serve both recreation, leisure, and ecological service functions of creating quality urban spaces in his plan. He went ahead to provide road infrastructure in the form of boulevards, avenues, and accedes. Further, Howard put in place land for public schools with adequate playgrounds, churches, library, town hall, museum, exhibition areas, sewer, industrial and agricultural units, not forgetting residential areas with well-calculated housing units with defined densities.

Three key lessons learned in Howard's approach to addressing urban growth and development challenges. Firstly, improved living standards- health and comfort- is achieved through creation of new planned towns. Howard recommends that plan preparation can occur, but for implementation purposes, identification of land has to happen for the plan to be realized. Secondly, livability is only achievable through an adequately balanced infrastructure distribution- both social, physical, and economical. The Garden City plan provides roads, schools, churches, green public open spaces, sewers, among other social infrastructure, to support the lives of the people envisioned to live in the planned land. Lastly, the functionality of urban development relies on a balance between social interests and economics. Howard recommends developing industries and agriculture at the periphery of the Garden cities to protect the residents from the pollution impact of industries but effectively link the residential areas to the industrial areas through road networks and railroads.

The new town concept of development has remained an intervention in the reconstruction of Europe after World War II and a solution sorted to address urbanization challenges. Furthermore, it has also presented an opportunity for investment by private investors. In Europe, New towns developed included Bourneville, Letchworth, and Walwyn in England, Noisel-Sur-Seine, and Valenciennes in France, Crespi in Italy, Agent Park, and Almere in Holland, just to mention a few (Gallion, 1950; Thorgeirsdotti, 2010). In Africa, Nigeria's Abuja City was planned and built as a new town to address Lagos' urbanization experience (Moore, 1984). Currently, Kenya is building its Technological Capital named Konza City in Machakos County.

The private sector globally has used the concept to seize the opportunity that comes with the inadequacies in terms of the infrastructural provision in public cities and the decay to develop new communities in mixed development outside the concentrated urban areas. These include Tatu City in Kenya, Alro City in Nigeria, Apolonia City in Ghana, Kiswishi in the Democratic Republic of Congo, and Roma Park in Zambia, just to mention a few cases in Africa (Rendevaeour Africa, 2020). The new towns/cities/urban areas present improved quality of living and economic progress based on infrastructure and housing quality, including security. Therefore, they further new town development concept as a relatively better approach to finding a solution to urbanization challenges.

2.10.3 Site and Service Schemes

Site and service schemes as an approach to improve the living condition of urbanites. The site and service approach was first introduced by the World Bank in the housing sector to address the housing challenges experienced in urban areas (Mabogunje, 1990). This approach's focus was that it targeted the low-income group that mostly contributed to the development of squatter and slum development in urban areas. Therefore, the land was acquired and serviced, including subdivision into the required lot sizes and provision of essential infrastructural services. Then the identified target groups were allocated and were allowed to build their houses and occupy them (World Bank, 1974).

The site and service concept and approach to solving urbanization challenges depicts a formal procedure of the urban land delivery model. However, the intervention addresses the informal and organic growth of urban areas incrementally, just as the theory of incrementalism explains. Its scope is smaller, giving it a similarity to the land readjustment intervention approach. The approach in the view of this discourse depicts minimal coordination of holistic urban development. However, it also gets the due credit of addressing informality in the urban context in Africa. Informality is endemic to Africa's urban areas, and coordinated planning occurs after the damage has existed. Therefore, the site and service scheme has been used to formalize the whole informality that originates with the conception of urban areas in Africa and Kenya in particular.

2.10.4 Urban Service Area (USAs) and Urban Growth Boundary (UGB) Concepts.

The concept USAs and UGB are urban management and planning tools that prevent informal and semiformal urban sprawl beyond formally planned areas. literature reviewed previously indicated that when an urban area has emerged formally or informally, there is always the inherent challenge of infrastructure provision within its periphery. The periphery always experiences rapid conversion into urban spaces in what has been recognized as urban sprawl (Gabrielson, Yorg, and Keith, 2009). Urban Service Area, as a principle, establishes

the limit within which the authority responsible for service delivery in an urban area will provide infrastructural services. USAs perform the dual roles of making urban developments beyond service areas cost prohibitive and also ensuring coordinated development of infrastructure with other land use developments within the areas that are projected to transform into urban (Gabrielson, Yorg, & Keith, 2009).

UGB as a principle is a prohibitive approach. It designates boundaries beyond which development is prohibited (Gabrielson, Yorg, & Keith, 2009). The UGBs as a concept is, therefore, applied in to prevent the change of use of land to urban like activities without a resolution by the authority and without a coordinated framework to ensure infrastructure is provided at optimal.

2.11 Urban Land Delivery and Infrastructure Provision Related Policy Frameworks

The policy review to inform this study takes the historical and chronological critic to the policies that have informed and guided land delivery and infrastructure provision in urban areas since independence. The review has deliberately avoided the pre independence period since the developments on land during the pre-independence period were in the ordinances reviewed after this section in this report. The selected policy framework enriches the study by putting into perspective the national direction on land development and a global perspective. The discussion on policies is as follows.

2.11.1 Sessional Paper Number 10 of 1965 “African Socialism and its Application to Planning in Kenya”

Relating to urban land delivery and infrastructural provision in Kenya's history under the policy frameworks, not much effort is seen in addressing urban development in the 20th Century under self-rule. Founded on African Socialism as a philosophy to guide development in Kenya, the Sessional Paper Number 10 of 1965 focused on standard infrastructural service provision in urban areas with a specific focus on the municipalities. The focus of the Sessional Paper Number 10 of 1965 was to eradicate poverty, ignorance, and hunger (Government of Kenya, 1966). The underpinning objective was to achieve social equity and welfare to prevent social segregation through utility infrastructure development. However, the policy framework did not look at urbanization as a force that would lead to social stratification if its emergence model were not pegged on formal delivery with strict control under government.

As a foundational policy in Kenya's independence, the policy recognized that poverty was more rooted in the rural areas. On that backdrop, short and medium-term development plans and government efforts were directed in developing the rural areas. Little focus was on the urban areas at the onset. With reference to this study, it emerges that the first national policy development created a weak foundation in addressing urban land delivery models. It instead adopted incrementalism approach to providing infrastructure in the already existing urban areas. The policy gave room for continuity in organic emergence of urban areas, which do not optimize provision of infrastructure, with incremental approach to augmenting infrastructure services. If this policy direction let the country to continue on the initially existing land development pathways, then it explains the reason for the non-optimal provision of infrastructure justified by the

theoretical findings that organic growth does not optimize provision of social and physical infrastructure in urban areas.

2.11.2 National Development Plans 1966 to 2008

Based on the foundations created by the Sessional Paper No.10 of 1965, the International Conference on Rural Development in 1966, focused on the management of rural development. The National Development Plans in the 1960s and 1970s were embedded on Special Rural Development Program and District Focus for Rural Development in 1980s, with little attention on informing the development of urban areas. However, the concerns were on the population concentration in Nairobi and Mombasa (International Bank for Reconstruction and Development, 1972). The concerns raised in the development plans in the 1970s were to redistribute population and to ensure rural-urban balance. Some of the matters that were focused on were the provision of infrastructure in the urban areas, which was selective and incremental according to the Growth Center Policy (Government of Kenya, 1969; Government of Kenya, 1995).

These policy documents did not focuss on the formal logic of planning dogma. Instead, they promoted urban areas that had already emerged from the informal development paths. It then followed that there will be selective provision of support infrastructure to act as pull factor to these urban areas. No formal planning and control on implementation guided such development, therefore, there was no stage at which infrastructure provision was optimized.

2.11.3 Human Settlement in Kenya: A Strategy for Urban and Rural Development, 1978

With the effort and desire to promote balanced development, Kenya's government introduced the Urban and Rural Settlement Strategy for Kenya in the year 1978. The policy aimed to concentrate the development of urban areas in Kenya selectively to ensure balanced development based on the potential of the hinterland of the various urban areas. The development of the policy was based on the already existing urban areas. Consequently, the policy furthered other policy strategies such as Growth Centers and Service Centers where infrastructure provision would be focused (Government of Kenya, 1978). The policy acknowledged the deficiencies in infrastructure provision in the urban areas in Kenya.

Further, it recommended the various infrastructure and services to be provided in the urban areas depending on the classification criteria proposed within the same policy. However, the policy did not examine the land delivery framework within which the urban areas emerged to associate the findings with the causes of infrastructural deficiencies in the urban areas in Kenya. The acknowledgment that the urban areas would continue to grow was unclear if the policy recommendations would address the infrastructural provision deficiencies if the model within which the land to which the urban areas grow is not interrogated and addressed.

2.11.4 Sessional Paper No. 1 of 1986 “Economic Management for Renewed Growth”

This Sessional Paper No.1 of 1986 also focused on promoting rural development through decentralization of urban centers to offer the rural population market and achieve rural-urban balance. The policy, therefore, recommended the establishment of the Rural Trade and Production Center Program that would establish more than 200 small rural centers.

In this study's context, this policy focused on enhancing the function and role of existing centers within the county councils' jurisdictions to focus on providing services to support investment in those identified rural centers (Government of Kenya, 1986). The policy built on informality with which the urban areas emerged from and did not focus on formal preplanning approach to address infrastructure provision.

2.11.5 National Development Plan 1994-1996

The National Development Plan of 1994/96 built on the policy strategies that were proposed in the *Sessional Paper No.1 of 1986, "Economic Management for Renewed Growth."* With a focus on the spatial aspect of the development strategies, the plan recommended Land Use Policies that focused on building the Growth Center and the Service Center policies, all focusing on deliberate efforts to deliver infrastructure as foundational consideration to promote economic growth.

The urban development policy direction in the National Development Plan of 1994-1996 focused on infrastructural provision with specific recommendations of health, education, sanitation, water, power, and other services within the service centers. However, there was no particular framework within which these infrastructural services would be provided. Additionally, the provision of infrastructure was selective to the selected service centers and growth centers. The fate of the other urban areas was undetermined. Furthermore, the policy strategies did not focus on creating purely new urban areas but those in existence. Tracing how these urban areas emerged, some were periodic markets (Government of Kenya, 1995). Some were government lands that followed the preplanned model but use growth had surpassed the originally established government land set aside for urban development.

2.11.6 Sustainable Development Goals (SDGs), 2015-2025

Upon the expiry of the timeline for the Millennium Development Goals (which had nothing to do with urban infrastructure or land delivery), leaders in 193 countries assembled in with a common goal of "Transforming our World in 2015. The leaders developed seventeen goals are supposed to be realized by the year 2030." Among others, the following specific goals were developed and are key in informing this study. Goal number six seeks to ensure the availability and sustainable management of water and sanitation for all. In the context of goal number six, understanding the implication of urban land delivery models is important in contributing to knowledge on whether the urbanization processes driven by various models are working towards ensuring availability and sustainable management of water and sanitation in urban areas.

Sustainable development goals number eleven seeks to make cities and human settlements inclusive, safe, resilient, and sustainable. The united nations intend to achieve goal number 11 by ensuring access to adequate, safe, and affordable housing and essential services by 2030 (UN-HABITAT, 2018). The basic services in the context of this study include the public goods and services that enhance social welfare and public interest. The possibility of achieving goal number 11 depends on how the models of delivery of urban land ensure sustainability in the provision of these essential services. Identified advantages and limitations of various models in this study are indicators of achieving this goal or failure. Furthermore, how different models contribute to infrastructure provision as the

urban areas grow is an indicator of progress to the realization of the SDGs. Therefore, the study shall evaluate the various models on their contribution to sustainable and resilient human settlement.

2.11.7 National Urban Development Policy, 2015

The National Urban Development Policy 2015 provides a framework for sustainable urban development. The specific objectives include: “good mainstreaming of governance, fostering safety, secure and livable urban areas, ensure adequate housing for all urban income groups; facilitate accessibility to the full range of social services that improve health, education, skills development and recreational needs of citizens in urban areas; promote integrated environmental planning and management and foster timely and adequate delivery/management of land for urban development.” The National Urban Development Policy, 2015, is key in guiding this study's synthesis on how urban land delivery models should be working towards achieving safe; secure livable, and sustainable urban settlements. The policy also informs the study to interrogate how urban development models influences social services provided to the urbanites. However, the policy does not address the models for delivering land for urban development. No logical steps to how to create urban places with optimum infrastructure provision.

2.11.8 National Land Policy, 2009

The National Land Policy's overall objective, 2009, is to secure rights over land and provide sustainable growth, investment, and the reduction of poverty in line with the government's overall development objectives. This policy's relevance is the economically viable, socially equitable, and environmentally sustainable allocation and use of land in an urban area. The study on urban land delivery models and the impact on infrastructure provision does not end in the examination of the models and their effect on infrastructure but rather extends to understand how the various models contribute to the security of rights and interest over land in urban areas.

Therefore, National Land Policy, 2009, informs this study in analyzing how land delivery models contribute to sustainable growth, investment, and poverty reduction as they influence differently on infrastructure. As the literature reviewed in the previous sections reveals, the models by which land delivery occurs are a threat to sustainability. Besides, informal land delivery models, as identified in the literature, have positive and negative implications on sustainability in provision and access to infrastructure. However, this policy does not give a meticulous solution to land tenure system in urban areas that have made planning and control not to be effective in organic and informal land delivery model.

2.11.9 Kitengela Zoning Plan (2012)

Kitengela Zoning provides a guide to help in development control to ensure harmony in the different land uses' location. The zoning plan for Kitengela urban area redistributes land for various uses in a broad perspective. However, it fails to ensure that land is available for urban development is proportional to the infrastructural requirement level. Instead, it rezones the area that was initially agricultural to residential with no proper and realistic avenues of achieving public interest through a standardized infrastructural provision. The zoning plan permits more land to be

used for urban development but does not address physical and social infrastructure provision.

The zoning plan superficially provides regulations but does not address the root cause of deficiency in addressing the public's interest in Kitengela. It has adopted the existing development pattern with the informality in the delivery of land that has developed over time. The implication of the phenomenon is that the area will still suffer from deficiency in infrastructure since the areas incorporated in the planning area and zoned are private land whose land use decision are dependent on market forces.

2.12 Emerging Opportunities in the Law to Optimize the Provision of Infrastructure

Despite the duality in the development trajectory that emerges from the formulation of laws in Kenya, Kenya's Constitution, 2010 created new dawn in post-colonial Kenya. Opportunities for the organization were presented in the constitutional promises that emanate from chapters four, five, and the fourth schedule of the Constitution of Kenya 2010. Firstly, Article 66 (1) gives the state the mandate to “regulate the use of any land, or any interest in or right over any land, in the interest of defense, public safety, public order, public morality, public health, or land-use planning.” The Constitution, 2010 summarises the public interest and social welfare in the authority it gives the state to regulate land use. In this context, the police power of the state is effected through land use planning and control. Additionally, Land Use Planning finds force from this constitutional directive as it is deemed necessary in guiding the achievement of public interest.

Secondly, the drafters of the Constitution of Kenya 2010 acknowledged the fragmentation in the land laws, and it is on this premise that Article 68 of the Constitution (2010) recommended the revision, consolidation and rationalization of the existing land laws. The Constitution further directs the revision of sectoral laws following the principles of land policy. Further to this directive, the land laws were consolidated in the Land Act of 2012. In the consolidation of the land laws, the Land Act, 2012 remains firm on ensuring optimal infrastructure provision through a preplanned land delivery model. The Act discourages and prohibits allocating public land without planning, survey, provision of services, and setting of development conditions and guidelines on such lands.

Enacted as per the requirement of the Fourth Schedule of the Constitution of Kenya 2010, Community Land Act, 2016 is a legislation that is to “provide for the recognition, protection, and registration of community land rights; management and administration of community land; to provide for the role of County governments concerning unregistered community land, and the connected purpose (Government of Kenya, 2016). The Act recognizes a preplanned model of delivering land for urban development and settlement. Under Section 13 (3) *b* and *e* of the Act, recommends reservation of Community Land for purposes of settlement or urban development, respectively. Therefore, under this provision, community land can be set aside for urban development. The Act, further, gives the community the powers to prepare and submit to the county government their plan for development, environmental management, and use of community land administered by the county. Within this framework, the urban areas that emerge from community lands are likely to optimize social and physical infrastructure provision.

2.13 Synthesis of Literature Review

The viewpoint of this study that is emerging from literature is coined in four-point areas. Firstly, The historical review of the urban land delivery models in Europe and America indicate some formality in the conception of urban areas within aforethought backed by legal backings. The same concept of delivering urban land is evident in the African coast, Kenya included. On the other hand, the periodic markets that have since transformed into urban places neither had signs of formal development nor settlement areas. Consequently, infrastructure provisions were never planned for in such areas.

Secondly, the introduction of formal planning in the late 19th and early 20th Century led to the conception of urban areas within a preplanned land delivery framework. The preplanned urban land delivery model ensured the optimal provision of basic social and physical infrastructure in Europe and America. The advantages of the pre-planned urban land delivery model as justified in the literature include improved public welfare and public health. The advantages of the preplanned model are the foundational justification of suctioning the planning laws to guide development in Europe. Similarly, the same governance system was applied in Kenya by the Colonial government, whose Kenyan formal urban development is traced. It is evident that the duality (formal and informal) urban delivery models are traced to the laws that governed urban development in Kenya in the colonial period. Disadvantageously, the African force of urbanization, as evidenced in models that land is delivered, is a major cause of deficiencies and non-optimal social and physical infrastructure provision. The logic of urban development was not adhered to in the African urban development concept. The Africans and Kenyans' move to settle in urban places is always with the focus of economic gain with little consideration of public interest and welfare. The phenomenon's resultant outcome is always informality coupled with deficiencies in social and physical infrastructure provision. Therefore, with this situation, the laws formulated to guide urban land delivery and infrastructure provision have become very difficult to implement since they are working on formalizing the already existing informality in most cases.

Thirdly, the urban development policies that have been formulated have not focussed on addressing the root causes of the non-optimal infrastructural provision from the urban land delivery models. Instead, they superficially address the problems with a strategic approach in social and physical infrastructure provision. The existing policy directions that have been formulated in Kenya have had the limited effort in rerouting the urban land delivery model to fix the infrastructural issues acknowledge as a major challenge in Kenya from the formal land development perspective.

Finally, It is a step by step conceptualization of the formal pre-planned urban land delivery model from the literature, there are clear cut stages that have to be followed to optimize the provision of infrastructure. In step one, a deduction from the history of urban development in Kenya and globally indicate that a suitable land has to be identified for urban development. The identification could also involve the acquisition of land by that authority responsible for guarding the interest of the public. Secondly, a plan that allocates land uses and social and physical infrastructure is also defined as public purpose in statutes reviewed above. Thirdly, having allocated land for public purposes, the rest of the land is allocated for economic, residential, or even industrial activities to be advanced by the private interest as the implementation of the plan takes off. Development control regulation and conditions must be adhered to by all the developers, whether government

or private sector. Therefore, it means that a formal development trajectory, a plan has to have in its development conditions (guidelines).

However, within this three-step model, some sub-steps draw from planning dogma and land planning laws. These include:

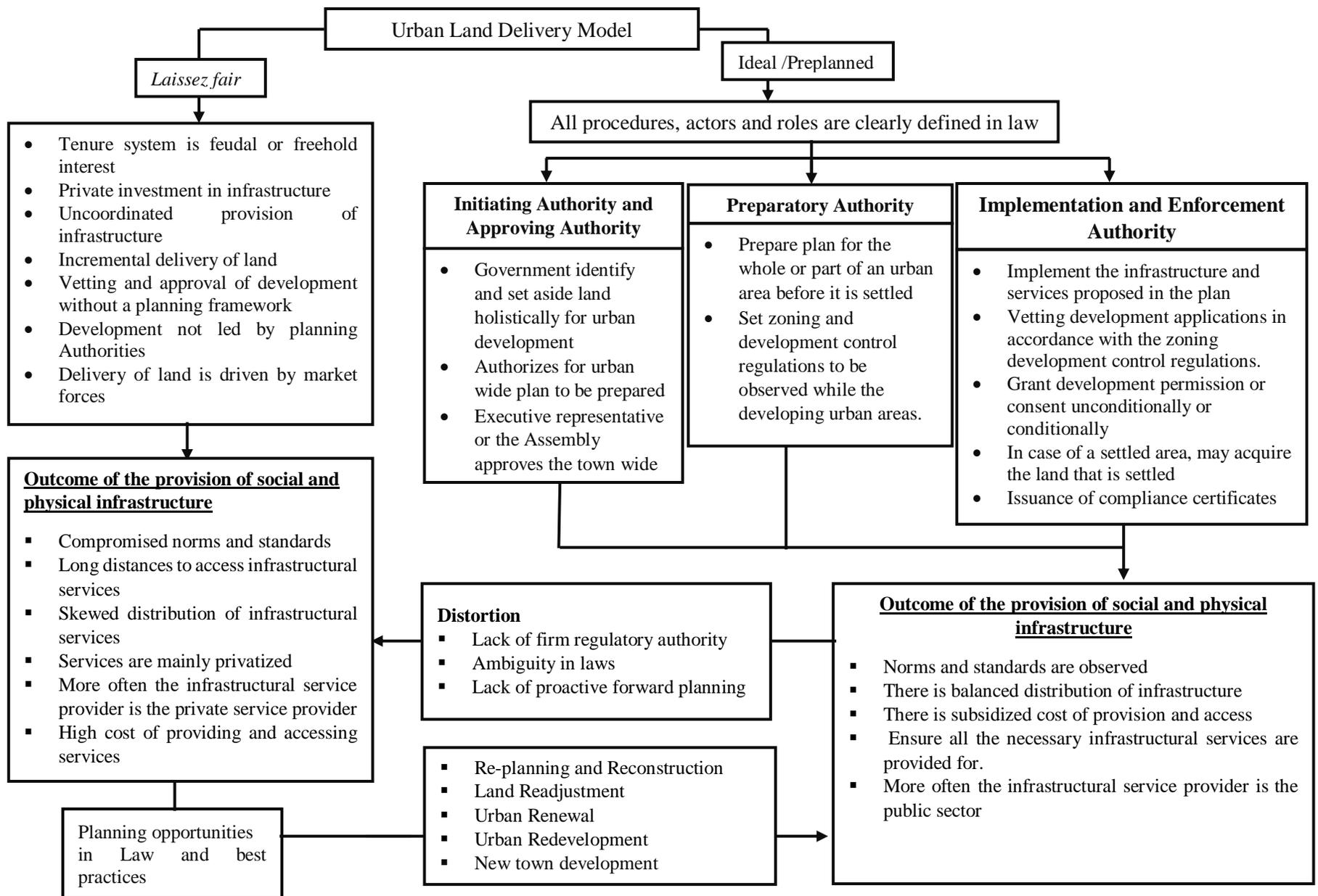
- a. According to planning law, the development control aspect of planning requires that it can only take place when there is an existing plan for an area (Government of the United Kingdom, 1947; Mwangi, 1988). It is also within the control that the development application is vetted to ensure compliance with development standards and champion public interest.
- b. Servicing of urban areas. The servicing of urban areas is quoted in Land Act with limited clarity on service provision scope. Furthermore, provision of service ranges from availing land for various services to the development/construction works to put the services in place. This sub-stage comes after plan preparation but can be concurrent with other stages. This is because the provision of services can be realized through other strategies depending on the availability of funding.
- c. The allocation of land to developers. The interest upon which the land is being allocated influences how the plan proposals can be implemented. Freehold tenure more often makes it very tedious to review development in urban areas continuously. On the other hand, the leasehold interest always gives the implementing agencies opportunities to review development conditions.

The model formal preplanned land delivery (*Identification of Land, Planning plus Development Regulations/Conditions, Allocation- allowing people to develop while abiding by the regulations*) arrived at in this study shows slight variations with what Ayonga (2019) postulated as the formal land delivery model with the logic of *Plan, Service, Build and Occupy*. This is because Ayonga was interrogating the development process upto when developers were given a greenlight to occupy the constructed buildings while in this study the focus is on how land is availed to facilitate urban development. The emerging variation is on the provision of service in urban areas which can be done concurrently with other developments of can be done before people are allowed to develop the plots allocated to them. Finally, in a broad perspective, there are three major models that have been established in this study. These include the purely informal model depicting the development path way that took place in the native reserves, there is the formal unplanned model that has greatly contributed to urban land as approved by the local authorities and the land control board without a broad planning framework and lastly, there is the formal preplanned model that delivered land on government land in Kenya, in Europe and America which this study holds as the ideal land delivery model.

2.14 Conceptual Framework

This study is conceptualized in the context of the land delivery model that exist and are being applied in Kenya. There are two main models, first is formal pre-planned model where land is planned beforehand for urban development. The second one is whereby there is no planning. In this second scenario, urban development is often characterized by the piecemeal intervention- what Lindbloom termed as disjointed incrementalism as an approach to policy decisions (Lindbloom, 1959). Furthermore, within the delivery models, there are the various institutions and players that control the systems and the processes of delivery as well as those that perform the enforcement role.

Figure 5: Conceptual Framework



Source. Author, 2020

2.15 Overall Information Gap

Studies have been done to investigate the urban land delivery processes. Leduka (2006) has investigated and explained the informal land delivery processes and institutions. Musyoka (2004) conducted research on the informal land delivery processes in Eldoret, Kenya, to establish the policy implications. Their findings justified the need to incorporate the informal procedures on land delivery models in the policy. Mwangi (1994) examined the “Urban Land Development and Planning Law in Kenya” (Mwangi, 1994). In his thesis, he did not focus on the impact of the various land development models on infrastructure provision. Instead, its establishment was a need for more planning laws to govern land development in urban areas. None of these scholars and researchers focused on establishing how the variations in the various land delivery models impact the provision of infrastructure. Therefore, this study will bridge the knowledge gap in understanding how various models of land delivery affect the provision of social and physical infrastructure in urban areas.

3. CHAPTER THREE- METHODOLOGY

3.1 Overview

This study followed various steps and activities to arrive at the findings that informed the conclusions and recommendations at the end of this report. This chapter detail the methods employed in undertaking the study.

3.2 Design

This study adopted a Non- Experimental Design or a Survey Design with both qualitative and qualitative approaches to measurement of variable.

Since there was no introduction of an experimental variable in the study, the interest is on the reactions to a specific event and how various land activities have occurred before the time this study is being undertaken. The design was adopted because it was toenable this study to draw facts and evidence about the phenomenon on urban land delivery models that are already in place and how the models have impacted infrastructural provision. This study simply drew a conclusion from the identified and observed state of activities.

3.2.1 Data Collection

The study entailed a general review of literature, primary and secondary data collection, and finally, data analysis, interpretation and presentation. The details of the data that was collected at various stages was as described below.

I. Literature review

Data on literature was gathered on:

- a) Urban Land delivery models - global (Europe, American,) and local (African) perspectives.
- b) There relationships and impact of the various urban land delivery models with and on infrastructure.
- c) The advantages and disadvantages of the various urban land delivery models
- d) The role of planning in urban land delivery models
- e) How to cope with the constraints that come with the various urban land delivery models.

II. Primary Data Collection entailed

- a) Data from county governemt officials on land delivery systems and the challenges and opportunities
- b) Data from the County Government on infrastructure provision and distribution within the study area.
- c) Mapping out the distribution of public infrastructure within the study area.
- d) Data from the national governement officials on land administration and the challenges and opportunities.
- e) Key informant interview with former ranch members on the land surrender for kitengela Urban area and the subsequent development on the surrendered land.
- f) An interview with the ranch owners on the procedures of land delivery through subdivision and change of user to urban land use.
- g) Field observation

3.2.2 Data Analyses and Presentation

Data analysis and presentation employed both qualitative and quantitative approaches to arrive at a logical conclusion.

3.3 Target Population

The targeted population in this study included the following:

All the developers (including companies and individuals) that buy, sell, or even build in Kitengela. The total land parcels in the selected area are approximately 12, 320. The population was targeted to give information on the procedures followed in undertaking development on land in the study area.

The study also targeted the members of group ranches that delivered the land that has since emerged as Kitengela town. The group ranches provided information on why the land was delivered for urban development and, further, shed light on what transpired on the land after the land's surrender.

Also, the agencies such as the Land Control board for Isinya Sub-County and the National Land Commission that deal with land administration attached to Kitengela were target population since they oversee and implement land management regulations that are meant to serve the interest of the public. Similarly, County government agencies responsible for land administration and planning were targeted to offer the same information.

Finally, all the households in Kitengela. Noonkopir (19,094), Kyangombe (28,821), and Chuna neighborhoods/estates (1996) in Kitengela were considered as part of the target population to provide information regarding the availability of social and physical infrastructure that constitutes social welfare and copying with the state of provision of infrastructure provision. The target population was then sampled based on the various techniques as explained in the sampling plan in this report.

3.4 Sampling plan

According to Mouton (2006), the sampling process entails selecting units from a population of interest for purposes of studying to draw a generalization out of the results from the chosen population (Mouton, 2006). This study adopted various types of sampling methods given that it was dealing with different target populations. Purposive sampling was adopted for the purposes of gathering information from the key informants that included agencies that included the Lands and physical planning department of Kajiado County, the National Land Commission in Kajiado County, the Land Control Board, Members of the Former Group Ranches. Additionally, the study areas within Kitengela were chosen purposively based on the various land delivery models that they conform to.

Three sections of Kitengela where land has been delivered using different models were purposively sampled (as indicated in map 1). These areas included Noonkopir- pre-planned land that was surrendered from subdivision of ranches, Kyangombe area where private individuals have supplied land through conversion characterized by high-density development, and Chuna Area where private individuals have supplied land through cooperatives-subdivision and conversion with medium density character. The selected areas' density character determined the strata of the selected areas where simple random sampling was applied.

Also, the households' sampling frames drawn from the Kenya Population and Housing Census list of 2019 (KNBS, 2020). The size of the sample was decided to be 30 for every neighbourhood in Kitengela. The decision on 30 samples per cluster was informed by the recommendation from various scholars that one can achieve normal distribution in a non-experimental research design by selecting a sample size of 30 and above (Cohen *et al.*,2000; Altunisik *et al.*,2004; Kwam and Vidakovi, 2007).

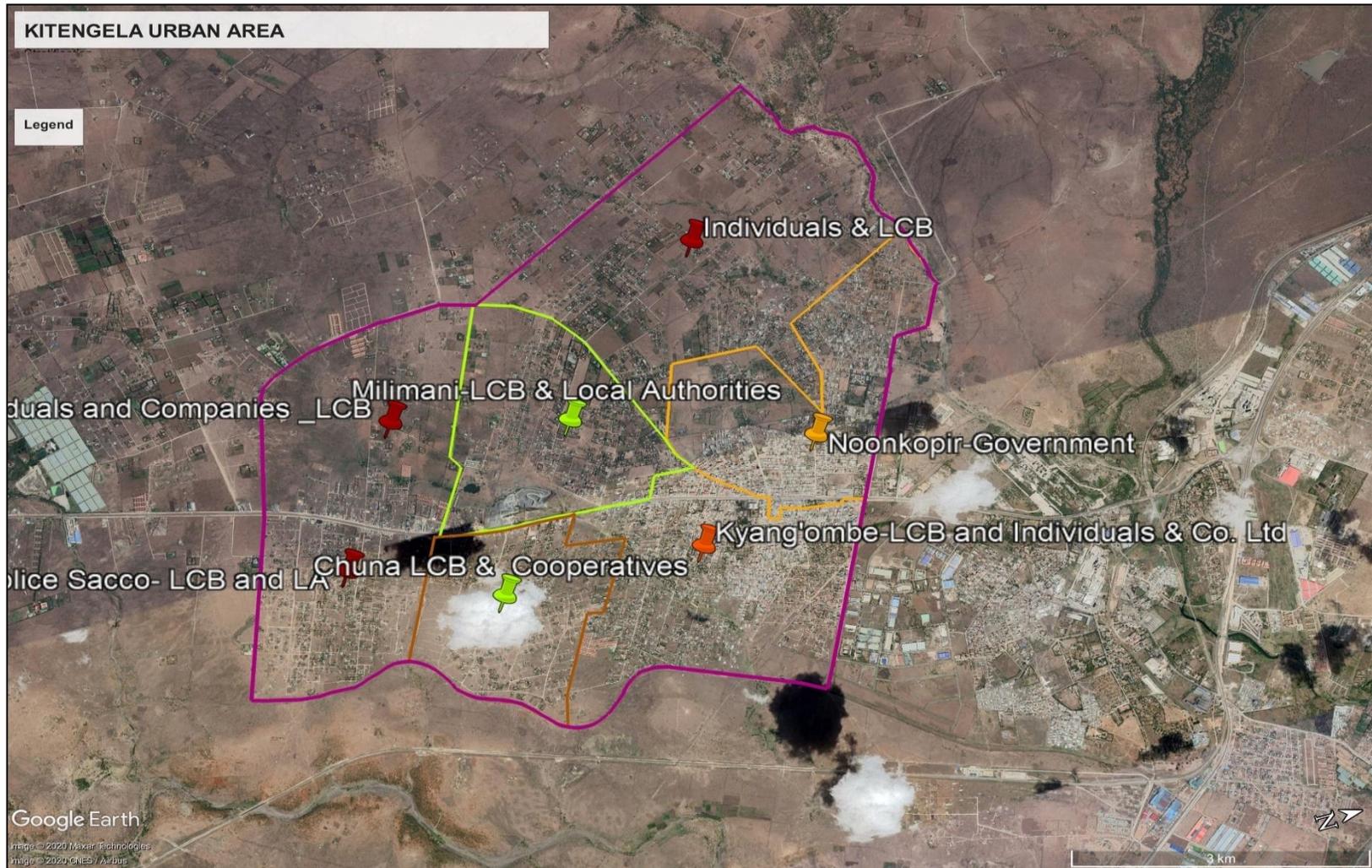
Having settled on the sample size of 30 per cluster, additional 25 for Kyangombe, 10 for Noonkopir and 5 samples for Chuna were added to the sample size for contingency purposes. The actual sample was, therefore, 130. The samples were drawn from the stratified sections of the study areas. The detailed distribution of household samples are as shown in table 1.

Table 1: Sampling proportions

Locality Within Kitengela	Sample drawn
Noonkopir	40
Kyangombe	55
Chuna	35
Total	130

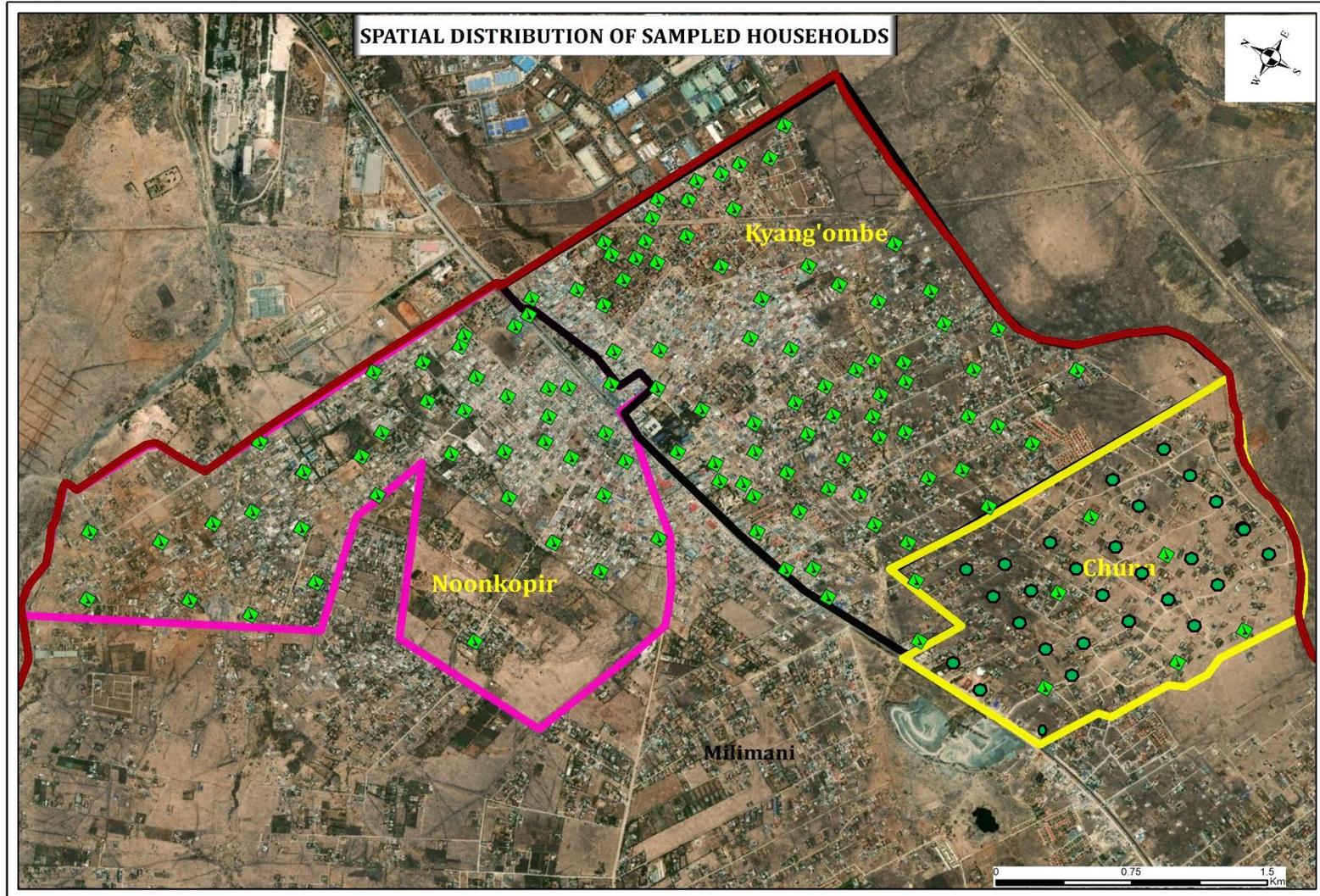
Source: Author, 2019

Map 1: Stratification of the study area.



Source: Adopted from Google images, 2020

Map 2: Spatial distribution of household samples



3.5 Data Needs Matrix

The data needed and their hypothesized sources are as presented in table 1.

Table 2: Process design matrix

Objective	Data Need	Questions	Source Of Data	Data Collection Method	Data Collection Tool	Data Analysis Framework
1. Establish how preplanned land delivery models optimize the provision of social and physical infrastructure.	<ul style="list-style-type: none"> ▪ History of Urban Development and Planning of urban areas including Kitengela Urban Area 	<ul style="list-style-type: none"> ▪ How did urban areas emerge? ▪ How was the land availed and developed in urban areas (procedures)? ▪ What factors were considered when the urban areas were being established? ▪ How was the infrastructure provided in the urban areas? 	<ul style="list-style-type: none"> ▪ Existing Literature ▪ Books, Journals, Legislations, Reports, Articals on Websites, Deserataions, Theses, Magazines, and conference papers have information on urbanization and urban development processes. 	<ul style="list-style-type: none"> Literature review and recording pertinent information Conducting key informant interviews. 	<ul style="list-style-type: none"> Index card Notebook Key informant guide. 	<ul style="list-style-type: none"> Synthesis of the information gathered. Transcribing the data. Criticing the information presented in the literature. Alignment of information according to themes.
	<ul style="list-style-type: none"> ▪ The preplanned land delivery processes of urban areas 	<ul style="list-style-type: none"> ▪ Which were the planned sections of Kitengela? ▪ How were they planned (the planning Process)? ▪ How the land delivered? ▪ Who were the planning authorities 	<ul style="list-style-type: none"> ▪ County Government of Kajiado's Department of Lands and Physical Planning 			

Objective	Data Need	Questions	Source Of Data	Data Collection Method	Data Collection Tool	Data Analysis Framework
		<p>in the planning process?</p> <ul style="list-style-type: none"> ▪ What was the consideration and conditions for delivering land? ▪ What are the relationships between land delivery and infrastructure development? 				
<p>2. Establish the reason for the disconnect between the land delivery models in Kitengela and the deficiency in social and physical infrastructure provision.</p>	<p>Foundational and current history of Kitengela Urban Area.</p>	<ul style="list-style-type: none"> ▪ How did Kitengela come to be? ▪ How much land was set aside for urban development? ▪ What procedures were followed from the delivery to the occupation? ▪ How has Kitengela grown in terms of land size from that area that was set aside? 	<ul style="list-style-type: none"> ▪ Kajiado County Government Department in charge of Lands and Urban Development ▪ Field Survey (Group Ranches, Developers /Land Owners) ▪ NLC ▪ Plans documenting the history of Kitengela 	<p>Conducting interviews with key informants in the Department of Lands and the members of the Group ranches and the developers. Administering questionnaires to the developers. Acquiring plans and reports</p>	<ul style="list-style-type: none"> ▪ Key informant interview schedule. ▪ Questionnaire ▪ Base map 	<ul style="list-style-type: none"> ▪ Aligning the the information according to themes and Transcribing ▪ Mapping out the extent of the area that was set aside for urban development. ▪ Establishing trends in the delivery of urban land.

Objective	Data Need	Questions	Source Of Data	Data Collection Method	Data Collection Tool	Data Analysis Framework
		<ul style="list-style-type: none"> ▪ What population was envisioned for the urban area? ▪ How have the additional areas been brought in for urban development? 		<p>containing information on Participatory Mapping out the extent that was set aside for urban development.</p>		<ul style="list-style-type: none"> ▪ Calculating areas of land delivered. ▪ Running frequencies of similar responses ▪ Establishing steps in land delivery and development processes.
<p>3. Investigate how residents in Kitengela cope with the deficiencies in the provision of social and physical infrastructure.</p>	<ul style="list-style-type: none"> ▪ Existence and distribution of basic infrastructure and services that reflect utility/welfare within the neighborhoods in Kitengela. ▪ These shall include land for education facilities, health, recreational 	<ul style="list-style-type: none"> ▪ How many education facilities were allocated land in the area? ▪ How many health facilities were allocated land in the area? ▪ How many recreational (playgrounds, open spaces) facilities were allocated to land? ▪ Where are these facilities located? 	<ul style="list-style-type: none"> ▪ County Government of Kajiado's Department in charge of Lands and Urban Development (Director lands Department) ▪ Field Survey ▪ Existing Plans for Kitengela 	<ul style="list-style-type: none"> ▪ Conducting interviews with the key informants in the lands department ▪ Observation during the field survey. ▪ Picking the GPS points of the existing basic public infrastructure. 	<ul style="list-style-type: none"> ▪ Key informant interview schedule. ▪ GPS machine ▪ Base map ▪ Observation Checklist. 	<ul style="list-style-type: none"> ▪ Mapping out the distribution of infrastructure. ▪ Measuring areas of land for various facilities. ▪ Calculating totals of facilities and amount of land. ▪ Comparison against planning standards and norms.

Objective	Data Need	Questions	Source Of Data	Data Collection Method	Data Collection Tool	Data Analysis Framework
	spaces, roads, water, solid and liquid waste management sites, and power supply infrastructure.	<ul style="list-style-type: none"> ▪ How much land was set aside for:- ▪ Road development? ▪ Water infrastructure development? ▪ Solid and liquid waste management? ▪ Education facilities? ▪ Health facilities? ▪ Power supply infrastructure? ▪ What were the planned capacities infrastructure? ▪ Are there, inadequacies? How do you address them? 				<ul style="list-style-type: none"> ▪ Transcribing and thematically aligning the information
4. Identify the opportunities that exist for the retroactive provision of social and physical infrastructure.	<ul style="list-style-type: none"> ▪ Best practices on Urban land delivery models ▪ Land management and regulation laws ▪ Advisory of planning laws. ▪ Case studies on how urban land 	<ul style="list-style-type: none"> ▪ What is the ideal urban land delivery model (s)? ▪ How has the model(s) been applied in various regions? ▪ What are some of the approaches that have been used to address the shortcomings of 	<ul style="list-style-type: none"> ▪ Existing literature ▪ Land Laws 	<ul style="list-style-type: none"> ▪ Literature review and pertinent recording information (from the Case study of best practices, Land Management Handbook, Planning and Land Use Regulations, etc.) 	<ul style="list-style-type: none"> ▪ Index card ▪ Notebook 	<ul style="list-style-type: none"> ▪ Synthesis of the information by: <ul style="list-style-type: none"> -Identifying the strength, weaknesses, opportunities, and challenges associated with the various approaches to solving urban

Objective	Data Need	Questions	Source Of Data	Data Collection Method	Data Collection Tool	Data Analysis Framework
	<p>delivery is done effectively.</p> <ul style="list-style-type: none"> ▪ Interventions that have been adopted in addressing urban land delivery challenges. 	<p>various urban land delivery models?</p>				<p>land delivery issues</p> <ul style="list-style-type: none"> -Establishing potentials, opportunities, and challenges in the legal advisories. ▪ Aligning the information according to themes

Source: Authors Construct, 2019

3.6 Data Collection Methods

The data collection methods depended on the type of data needed and the source to which the data was obtained. Before the data was collected, the validity and reliability of the data collection instruments were tested.

According to Sproull (1995), the validity is the extent to which or how well an instrument measures what it was intended to measure. The instruments' validity was established by sharing the research instruments with the supervisors and the extent to which the tools yielded the required responses to the study hypothesis.

As defined by Phelan and Wren (2006), reliability is the degree to which a tool yields a consistent result on the same subject. In this study, the reliability of the tools was tested using the test-retest method. Sample tools were administered to the same household head with a one-week interval to test the validity. The first and the second result were correlated on an SPSS platform, and the resulting validity coefficient was 0.75. The similarity in the scores convinced this study on the validity of the research instruments.

3.6.1 Examination of Documents

All the data from the literature were collected through the examination of documents gathered from secondary data sources. The documents examined included the Kitengela zoning plan of 2020, previous study reports documenting the provision of infrastructure in Kitengela, Population, and Housing census report that gives the population and households in Kitengela, and the Development Plan for Kitengela 1975. The plans informed this study on the history and land use distribution for infrastructure in Kitengela.

3.6.2 Conducting Interviews

Conducting interviews as a technique applied in data collection in this study entailed having predetermined sets of questions (interview schedule) that made the interview structured and focussed on the study's intended objectives. According to Sproull (1995), an interview schedule is a questionnaire directed toward the oral interaction between the respondent and the interview. Data from key informants were collected through interviews with the officials in the County Government of Kajiados, Lands and Physical Planning Department, Isinya Sub-County's Land Control Board, Former Kitengela Ranch Members, and Key informants who have the history of Kitengela.

The interviews yielded both qualitative and quantitative responses that sort to answer the research questions.

3.6.3 Instruments Administration

This study employed the administration of instruments as a method of gathering information. This study conducted a pilot test with a small representative sample (7 household). It was established from the pilot that some of the questions were unclear and difficult to answer by the respondents. These questions were restructured and simplified in the actual data collection exercise. Instrument administration was applied in gathering information from the households and land owners/ developers (questionnaires and interview schedules).

The interviews with key informants provided information on the history of urban land delivery models and the development procedures in urban areas. The interviews yielded both qualitative and quantitative data that is believed to provide vital knowledge on the

various land delivery models and the relationship with the provision of social and physical infrastructure.

3.6.4 Observation

The availability of social and physical infrastructure within the required standards was collected through observation and filling in the observation form. The observation technique was based on the Chapin and Keisers elements of public interest. Therefore, the study observed and recorded the availability of public water supply, public health facilities, public education facilities, public open spaces and play grounds, the hierarchy of roads, public waste collection and management infrastructure, and social halls and fire breaks within the research area.

3.6.5 Mapping

In detail, this study also adopted mapping as a data collection methodology to establish the proximity to infrastructural services within the areas by various land Parcels. On the other hand, taking measurements was used to get the road widths and compare them with the recommended standards and norms of road provision within the neighborhoods for comparative analysis purposes.

3.7 Data Analysis Methods

Data analysis was undertaken based on the data gathered, as illustrated in the data needs matrix table. Content analysis was adopted for qualitative data, which included information on the history and the delivery systems, development control procedures, the advantages and opportunities that come with various urban land delivery models.

This study also developed a scoring criteria for the analysis of the level of infrastructure provision within the various land delivery pathways. The criteria was informed by the normative theory, and the published global standards of provision of social and physical infrastructure. The scoring criteria was key in enabling hypothesis testing in this study. The criteria is as shown in table 3. The maximum score was determined by the population requirements as dictated by norms and standards in the various infrastructural service delivery.

Table 3: Scoring criteria

Public Infrastructure type	Level	Expected number based on population	Score per service (point)	Maximum Score @ each service (points)	Existing number	Score
Schools	Secondary		10			
	Primary		10			
	Pre-primary		10			
Health facilities	Health center		10			
	Dispensary		10			
	Clinic		10			
Public water Supply	Water reticulation system		10			
			10			
Open spaces/ Playgrounds	Neighborhood		10			
	Pocket park		10			

Public Infrastructure type	Level	Expected number based on population	Score per service (point)	Maximum Score @ each service (points)	Existing number	Score
Sewer System	Neighborhood		10			
Cemetery	Town		10			
Security facility	Police post		10			
Total						

Source: Author's construct with modifications from (Norms and Standards for Health Service Delivery, 2016, Physical Planning Handbook, 2007, The Minimum Standards in Water, Sanitation and Hygiene Promotion, WHO, 2013).

The criteria set in table 3 was used independently in each of the selected areas of Kyangombe, Noonkopir and Chuna.

Descriptive analysis was used for quantitative data for effective interpretation to a logical conclusion. The quantitative data analysis was done with computer programs such as Statistical Package for Social Science (SPSS) and Microsoft excel. Finally, a statistical test (Chai Square) was employed to test the null hypothesis to accept it or reject it.

Furthermore, comparative analysis and discussions to understand the models of urban land delivery was key in synthesizing the processes that were followed in developing urban activities on the land parcels in the study area.

3.8 Data Presentation Plan

The statistical information were presented in charts and statistical tables format to ease interpretation. Specifically, The distances to access the basic infrastructure are expressed quantitatively while qualitative statements were put forth to further elaborate on the impacts of such phenomena as was established.

Qualitative data were presented using photo illustrations, narratives, and descriptive text format as well. Further, the spatial data are presented using maps. The maps were key in illustrating the buffers between the infrastructural facilities and the access thresholds. The maps further show the level of balance or skewness in infrastructural service provision based on the various areas in the study area. All this information were put together in a report.

3.9 Ethical Considerations

According to Akaranga and Makau (2016) ethics refers to “ethos or way of life, social norms for conduct that distinguishes between acceptable and unacceptable behavior.” Research ethics as have been described as a branch of applied ethics has well established rules and guidelines that defines the conduct(s) of researchers as professional (Akaranga & Makau, 2016). The ethical considerations should hence endeavour to protect the dignity of the researchers subjects (including respondents) and properly handle and publish their information including guaranteeing anonmyty and confidentiality on the information shared (Akaranga & Makau, 2016).

In undertaking this study, it was anticipated that research assistants might not exhaustively give information to completion as required. The researcher may also meet

unexpected eventualities or hostility or be beaten due to suspicion or unforeseen circumstances. To counter such eventualities, the study adopted a consent form that the researcher filled to raise his/her attention to the occurrence of such eventualities and how they could be addressed. Additionally, the participants were granted the right to withdraw from the research process. They were made aware at the beginning of the process. No pressure was put on them to finish incase they wished to pull out.

In other instances, the researcher or the research assistants could have fail to get information due to suspicion or due to being strange in the neighborhoods, the study put in a mitigation measure by obtaining a research permit from National Commission for Science Technology and Innovation (NACOSTI). The study also obtained an introductory letter from the university to build confidence in the respondents that the study was being conducted with good intentions with authorization by the relevant authorities.

Additionally, the respondents were asured of confidentiality in handling and publication of the information gathered in this study. The study also ensured that there is no fabrication or falsifications to uphold primary objectives of research ethics (Mugenda, 2003; Kour, 2014).

Finally, the this study observed originality of ideas and where ideas were borrowed, proper citation and acknowlegdments are done. To comply with the Univeristy of Nairobi's policy on plagiarism this report has been subjected to turnitin software to assess its plagiarism rate. The plagiarism report indicates six percent (6%) indicating compliance with the policy provision of plagiarism level being 15% or below. The report turnitin report is acknowledged and submitted together with this projects to the Board of Post graduate Studies for approval.

4. CHAPTER FOUR-STUDY AREA

4.1 Overview

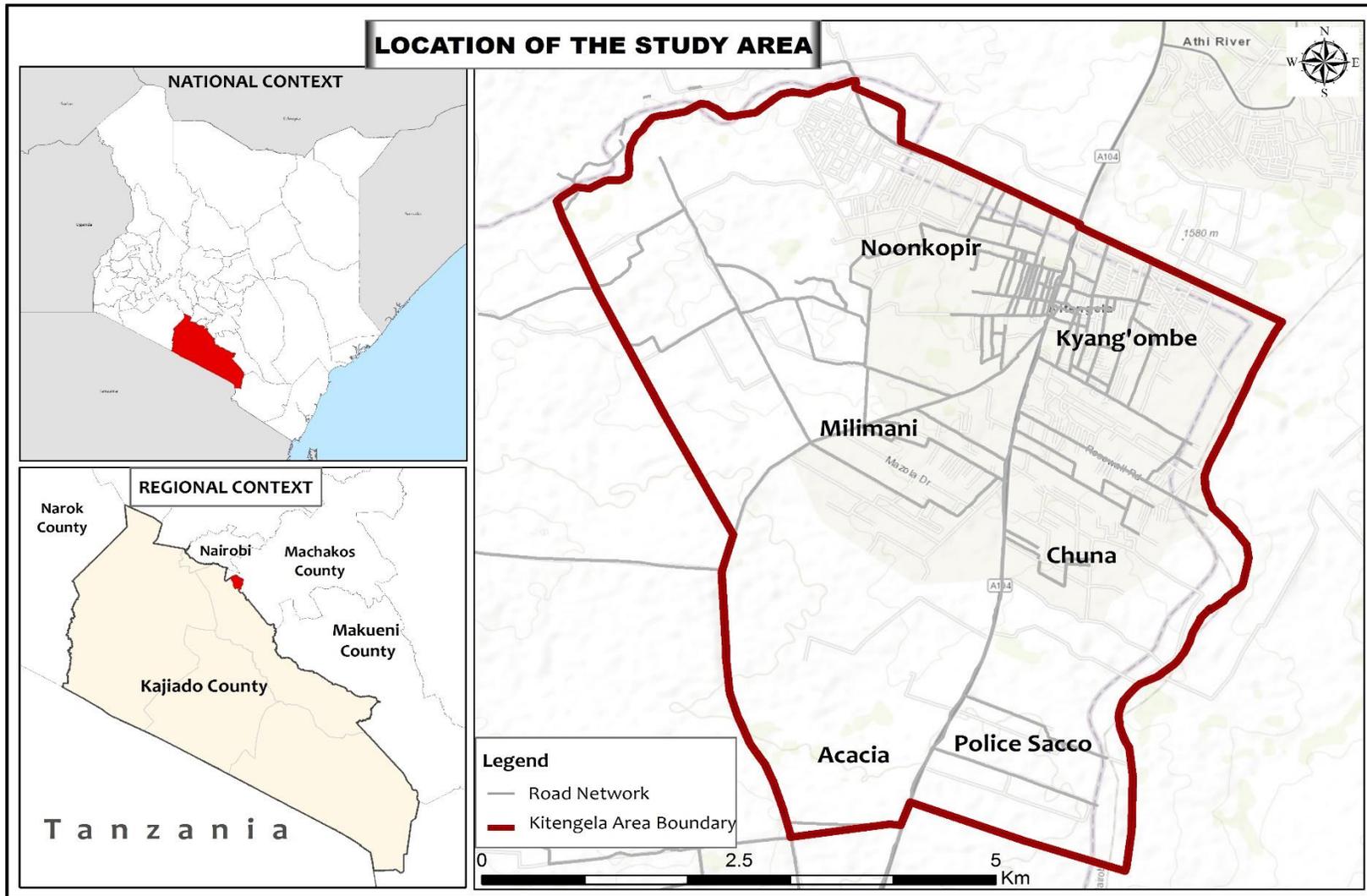
This chapter relates the background and context of the study area. It expounds on the locational context, demographic dynamics, climate, and physiographic features, sociocultural and economic profile, as well as social and physical infrastructure in the study area.

4.2 Geographical Location

Kitengela urban area is located 30 kilometers south of Nairobi City's Central Business District (CBD) within Kajiado East Sub-County in Kajiado County. The town also borders Machakos County's Athi River town to the North East, Nairobi National Park to the North, Olturoto to the South, Keekonyokie to the West. The whole town is approximated to cover 89.19 km² in size (County Government of Kajiado, 2012).

New Valley Road and Noonkopir areas (the area intended to be studied) are high-density areas depicting varied densities urban land delivery models. The Noonkopir area is part of the land that was surrendered after the ranch's subdivision. In contrast, in the New Valley area, the land has been delivered incrementally through the land subdivision and change of user. This study will permit a comparative assessment of infrastructural provision and conclusions drawn by studying these diverse areas.

Map 3: Locational context of the study area



Source: Author's edits, 2019

4.3 Demographic Dynamics

According to the 2019 population census, the urban population of Kitengela town is approximately 147,097 persons. This population has drastically changed since the urbanization rate (3%) is quite accelerated the fact that the town is in close proximity to Nairobi. The growth is also attributed to industrialization in Athi River Town and the establishment of export processing on the town's North-Eastern edge.

The indigenous population of Kitengela town is the Maasai, whose main economic and cultural practice is pastoralism. There has been an influx of people from other areas into Kitengela town. The phenomenon is attributed to the availability of land for investment and settlement. Due to urbanization, Kitengela has become a cosmopolitan, hosting people of diverse ethnic origins. Population growth and urbanization have occurred in parallel with land tenure changes in Kitengela (Wathome, 2016).

The population growth rate and size are key in determining the urban land requirement. Population density and distribution are also important in influencing infrastructural provision and distribution. These are some of the factors that shall also be considered in undertaking this study.

4.4 Climate and Physical Features

The Kitengela lies at 1573m above mean sea level. The climate in Kitengela is warm and temperate. The climate here is classified as Subtropical highland climate or temperate oceanic climate with dry winters also symbolized as Cwb by the Köppen-Geiger system (Climate Data. Org, 2019). The temperature here averages 19.2 °C. The average annual rainfall is 592 mm. The area is generally dry, usually characterized by the prolonged dry period similar to the general characteristic of semi-arid areas. Two rainy seasons characterize the area. According to Kenya Climate Data, the short rains between October and December and the Long rain between March and May (Climate Data. Org, 2019). This climatic condition does not favor crop cultivation; therefore, development efforts have been directed to sectors such as real estate and commerce as well as industrial.

Kitengela is generally plain. It is part of the greater Athi-Kaputiei Plains. It is drained by River Athi that drains North Eastwards. The area is characterized by dry valleys that drain stormwater during the rainy seasons. The valleys include Ilkeek-Lemedungi, Green Valley and Kisaju that form the southern border of the town. The area mainly consists of wooded grassland, open grassland, and scrubs with open grassland having scattered trees (Kitengela Zoning Plan, 2012). Athi series, Kapiti phonolites and basement system rocks define the geology of the area. The major aquifers in the area are in the Upper Athi Series due to the availability of tuffs, lake beds, and sediments between the phonolites. Other aquifers are found in basement rocks due to fracturing and exposure of the rocks due to erosion (Ministry of Natural Resources and Wildlife, 1966 in Wathome, 2016).

Topography and climate have a significant impact on influencing urbanization and the provision of infrastructure. Areas with rainfall and temperature characteristics that present high agricultural potential often experience population surges, speeding up land-use conversion from agricultural to urban. Topography, on the other hand, influences the provision of infrastructure and utility services. Studies have shown that it is expensive and difficult to develop roads, sewer, and water supply infrastructure in the rugged terrain of hilly and slopy

areas. These are factors that this study shall take cognizant of when examining the implication of the various urban land delivery models on the infrastructural provision in Kitengela.

4.5 Socio-Economic/Cultural Profiles

Kitengela falls on the outskirts of Nairobi City County. The transformation has taken place in the area over the years. Kitengela was initially a group ranch up to the 1970s. Kitengela began as the Kitengela group ranch made up of 18,292 hectares and 214 registered members (all Maasai), which was subdivided in 1988 in efforts by the Government to encourage private land ownership in pastoral systems to intensify and commercialize livestock production (Kristjanson et al., 2002 cited in Wathome, 2016).

The proximity of Kitengela to Nairobi has impacted greatly on the economic and social transformation of Kitengela. Urban sprawl and investment have intensified, and so is the land subdivision and conversion for urban development. Wathome (2016) puts it that “the economic transformation has been amplified by the refurbishing of the Athi River-Namanga Highway and the expansion of water supply (Export Processing Zone water supply) to Kitengela” (Wathome, 2016). Formal and informal business investments exist in Kitengela. The common establishments include greenhouse farming, industrial establishments, wholesale and retail activities, financial services, institutions, and offices, among others. Kitengela’s local economy hinges on industries, service, commerce, and land commoditization.

The opportunity to offer a dormitory role for the Nairobi Metropolitan area has seen Kitengela experience a boom in real estate investment and development. The construction sector has since become an economy in an area where livestock and wild animals roamed more than two decades ago. According to the study conducted in 2016 in Kitengela “the Kenya Export Processing Zone (EPZ), premier blue-chip companies and government parastatals such as the East African Portland Cement, the Athi River Mining, Kenya Meat Commission, and Ken chik Limited are located within this locality raising the stakes of real estate development (Wathome, 2016).

Plate 1: Real Estate, Trade and Commerce in Kitengela



Source: Author, 2019

4.6 Social Infrastructure

The provision of social infrastructure in Kitengela has been through both public and private entities. The existing social infrastructure includes school, hospitals, open space, police station, chiefs camp, children’s home, churches, mosque, a market, and a prison.

There are four secondary schools and six full primary schools. The only public schools include Kitengela Prisons Primary School and Kitengela Girls Secondary School, the rest being private. Several tertiary institutions also exist in town. All of them being private institutions.

The town's health facilities include Aga Khan Hospital, Gertrude's Hospital, Kitengela Medical, Kitengela Pona, Penda Health Centre, Meridian Hospital, and Kitengela Health Centre. Health service provision is dominated by the private sector, with only Kitengela Health Center being public.

The number, distribution and coverage of the social infrastructure will be the indicators that will be measured to inform this study on how land delivery models in the various sections of Kitengela urban area has influenced the provision of social infrastructure.

Plate 2: Kitengela International School and Kitengela West Hospital in Kitengela Town



4.7 Physical Infrastructure

The high-impact physical infrastructure in Kitengela is the Namanga Road with is a class 'A' road. The road dissects the center of the town. The A 104 road is linking Kitengela with Nairobi city, Kajiado, Isinya, and Namanga towns. It also extends to Tanzania through Namanga. The main roads within the town for internal movement and accessibility include Kitengela-Rongai road (Ngurunga road), EPZ road, Noonkopir road, Pinto Road, Kitengela Prisons, road, Deliverance road, Acacia road, and Old Namanga road (Wathome, 2016). These roads have been a major contributor to the development of Kitengela.

Kitengela also enjoys a network of roads that have resulted from the subdivision of the ranches. However, the roads are unpaved and are narrow. The only paved roads include the Namanga road, EPZ road, Jamii Bora Bank Road, and Miriam road. The rest of the roads are either graveled or murrum, while some are earth roads.

The railway line defines the eastern edge of the town. There is, however, no linkage of the rail activities to the town activities.

Liquid waste treatment is mainly through pit latrine and septic tanks. Up to date, there is no public liquid waste treatment infrastructure. However, there is a dumpsite in Noonkopir area that serves the town though its capacity is exceeded.

The town is supplied with water by the EPZ water project and supplemented by private boreholes and rainwater harvesting measures. However, there is a need to enhance the water supply in Kitengela

The town is connected to the national electricity grid with a Kenya Power and Lighting Company substation within the town. Additionally, there is adequate telecommunication infrastructure and service provided by the mobile network service providers in Kenya. The distribution of physical infrastructure is skewed to the area where the defunct local authority delivered the land, like in Noonkopir area. Furthermore, the roads are narrow and have not met the planning standards within the areas that land has been supplied through the private sector (Subdivision and Conversion).

The coverage and network of road infrastructure and utility services, including the capacities, will be measured in this study to inform the study on how the various urban land delivery models impact road infrastructure provision, water supply provision, electricity provision, and sewer and sanitation infrastructure provision.

5. CHAPTER FIVE-FINDINGS AND DISCUSSIONS

5.1 Overview

This chapter relates the findings of this study as obtained from the field survey conducted. The findings are an emanation from the analysis of the data obtained from instrument administration, filling observation checklists, and conducting key informant interviews. The findings presented here include how the preplanned model optimizes social and physical infrastructure, how various urban land delivery models have contributed to the provision of social and physical infrastructure in Kitengela. Additionally, the chapter presents how the residents of Kitengela cope with the state of provision of social and physical infrastructure. Finally, the chapter presents the opportunities for the retroactive provision of social and physical infrastructure.

5.2 Response Rate

The overall response rate from the targeted respondents was 87% (figures elaborated in table 4). The response rate as observed from this study is deemed very good and adequate. Mugenda and Mugenda (2003) and Dixon (2012) hold a common view that a response rate greater than 70% is very good. Table 4 presents a summary of the response rate from the study conducted.

Table 4: Response rate

Research Instrument	Expected Responses	Actual/Received Responses	Response Rate
Household Questionnaires	130	130	100%
Developers' Questionnaires	30	20	67%
Observation Checklists	3	3	100%
Interview guides/ Schedules	5	4	80%
Total	238	187	

Source, field survey, 2021

5.3 Demographic Information of the Respondents

The respondents' demographic information in the study conducted in Kitengela included gender and age. Out of all samples interviewed, forty-four percent (44%) were male, while fifty-six percent (56%) were female. The average age of the population interviewed was 41 years, while the range was between 18-79 years. This result indicates that the conclusion from the findings holds in this research since the respondents were adults.

5.4 Findings

The findings on the first objective of this study was achieved in literature review. Objectives two and three were also established in literature review and further proved in the field survey as presented herein.

5.4.1 Models Contribution to Provision of Social and Physical Infrastructure.

Kitengela as was explained in the methodology chapter of this study, presents various models which according to the literature fall under the broad category of semi-formal model. The variations in the semi-formality in Kitengela is dependent on the tenure system and the

development process that was followed to avail the land for urban development activities. Within this context, three sub-models of semiformal model in Kitengela contribute to the provision of infrastructure in varied proportions. These variations were established in Noonkopir, Chuna and Kyangombe. How these models contribute to infrastructure provision is as follows.

i. Noonkopir (Semi-Formal/County Council Model)

According to the response from the key informant interviews, in the year 1974, the Subdivision of Kaputei North Group Ranch led to the surrender of approximately 150 acres of land for the establishment of a market center at Noonkopir in Kitengela. This was a process that was led by the ranch members and the land control board.. During that time, and as per the provision of the independence constitution (1963) and the Local Government Act Cap 265 the land was under the control of the County Council of Kajiado who held it in trust of the community. Guided by the Local Government Act Cap, 265, the County council attempted to prepare a scheme plan to allocate public land for public purpose, commercial and residential development and also to earn revenue from the land. However, this was not binding since there was no law to provide for plan preparation on community land held intrust by the local authority. So the process of land delivery under the county councils model was not defined in law to completion. The provision was enabling the local authority to subdivide and allocate land as was identified in the literature review chapter. Since there was a gap in the law the optimization of infrastructure could not be achieved and the covenants and conditions of lease could not be enforced. At this point the model in which Noonkopire was delivered deviated from the ideal land delivery model.

According to the survey conducted in 2020 and 2021, review of documents in this study established that, the plan that was prepared by the Olkejuado County Council in the year 1975, allocated land for the following social and physical infrastructure to offer both the anticipated urban and the existing rural population.

- | | |
|--|---|
| i. Nursery School | ix. Slaughter House |
| ii. Livestock Holding and Auction yard | x. Police Station |
| iii. Two Secondary Schools | xi. Health Center |
| iv. Two Primary Schools | xii. National Administration Government |
| v. Churches | xiii. Local Administration Government |
| vi. Mosque | xiv. Solid Waste Management Site |
| vii. Market | xv. Public open spaces (playgrounds) |
| viii. Industrial area | |

Urban Road System in a graduated hierarchy (from access at 6m width to the highway at 60m width).

The rest of the land was subdivided into plots and then allocated for industrial, residential, and commercial use under the leasehold tenure system.

From the interrogation of the existing plan for Noonkopir area and interview with the Director in charge of Urban Development in Kajiado County (2021), the plan observed standards and norms in the social and physical infrastructure provision based on the anticipated population

of that time. However, the failure of the delivery model that was applied in Noonkopir area was due to failures in the implementation of the plan. Since the planner was bypassed in the implementation and enforcement, the agents were able to reallocate the land for public infrastructure to suite the political interest and to sacrifice the public interest.

Not all the proposed social and physical infrastructure were implemented before the people were allocated the plots. The priority infrastructure was road development. Other infrastructure developments such as schools and health facilities were implemented concurrently with other residential and commercial developments as were dictated by the availability of financial resources. Despite the land being set aside for facilities like nursery schools, the survey was not done for the plots to fix property boundaries. Infrastructure were not all constructed after the planning was undertaken, and the plan was not approved, which made the land allocated susceptible to irregularly re-allocation. Some of the allocations in the 1975 plan for Noonkopir area were further reallocated informally, and the uses were changed to commercial and residential, leading to the non-optimal provision of infrastructure in the area. It was evident that planning and control was not now part of the implementation of the proposed development to check compliance. This has caused the current distortion observed in Noonkopir area.

From the observation and mapping done in Noonkopir it was established that some of the public infrastructure land that were planned are replaced by private developments like residential and commercial activities. stand alone preprimary schools, industrial plots, cemetery and parts of the public open spaces have been replaced by residential development. if subjected to the scoring criteria developed for this study, Noonkopir scores 110 points out of 570 pionts representing nineteen percent (19 %) level of provision of physical and social infrastructure. The individual score by infrastructure is presented in table 5.

Table 5: Noonkopir's level of contribution to the provision of infrastructure

Public Infrastructure type	Level	Expected number based on population	Score per service (point)	Maximum Score @ each service (points)	Existing number	Score
Schools	Secondary	2	10	20	2	20
	Primary	11	10	110	2	20
	Pre-primary	22	10	210	3	30
Health facilities	Health center	2	10	20	0	
	Dispensary	6	10	60	0	
	Clinic	9	10	90	0	
Public water Supply	Town Water reticulation system	1	10	10	1	10
Open spaces/ Playgrounds	Neighborhood	1	10	10	1	10
Sewer System	Town level	1	10	10	0	0
Solid waste management	Neighborhood	1	10	10	1	10
Cemetery	Town	1	10	10	0	0
Security facility	Police post	1	10	10	2	20

Public Infrastructure type	Level	Expected number based on population	Score per service (point)	Maximum Score @ each service (points)	Existing number	Score
Total				570		120

Source: Field Survey, 2020.

The Noonkopir model shows an attempt to achieve optimal infrastructure provision since it followed the formal planning framework of urban land delivery. Its only failure has been on the approval and implementation. This short coming has enabled the distortions to take place in the model to further make it inefficient in delivering physical and social infrastructure. As revealed by the field survey, the development control process applied in the area reveals the deviation from the ideal model that requires a plan to be in place; survey conducted for the land to be allocated; infrastructure put in place; then the developer to seek development permission; submit subdivision scheme or building plans, (including a site plan) to be interrogated for purposes of establishing compliance with the regulations that ensures public health, safety, convenience, energy conservation, aesthetics among other conditions such as building character. Instead, there is a more inclination towards vetting building plans and subdivision schemes for billing and revenue generation at the expense of championing public interest. In Kitengela urban area, upon approval of the building plans, there is a limited follow-up to validate compliance without the issuance of occupation certificate to the developers who construct the buildings in the area. From the interviews with developers conducted in the area, none (100%) of the developers was issued with an occupation certificate to indicate full compliance in the development process, which is the last stage in the preplanned development model as put forth by Booth (2003) and Ayonga (2019).

On the other hand, the physical infrastructure and utility services are mere attempts since they do not effectively meet public interest elements. Such deficiencies in the area indicate a disconnect between the model applied in Nookopir and the ideal model. Furthermore, they do not meet the neighbored planning principles. As established in this study, the physical /scheme planning took place as it was supposed to be undertaken despite the approval. However, the failure was in the implementation stage, where not all that was proposed for social and physical infrastructure were implemented. It is recognized that the major challenge of infrastructure provision in urban development requires finances. If the finances are inaccessible, infrastructural development is likely not to be realized despite land use allocation (Ballaney and Patel, 2009).

Finally, the development processes and planning of the area did not comply with the standards and norms of service provisions in an urban setup based on the existing population. Due to lack of observing the norms and standards of neighbourhood planning and the general standards of infrastructural provision Noonkopir scores as low as 19% in provision of basic infrastructure.

ii. **Kyangombe (Semi-Formal/ Individual/Private investment model)**

Kyangombe area of Kitengela was incorporated into urban development through land subdivision and change of use from agricultural. The resident group ranch members sold the land parcels in forms of plots, which were converted to residential and commercial

land uses. This is a land delivery model attributed to the Land Control Board responsible for the Kitengela area and the County’s Physical Planning Department with more contributions from the defunct Olkejuado County Council. The major development proponents were individuals, companies who procured land and subdivided it, then sold it to buyers who were willing to invest. In this study, the model adopts a semi-formal model of land delivery with the deviation from the ideal model being lack of coordinated planning stage in the development pathway.

The field study in 2020 revealed that there is minimal provision of public social and physical infrastructure in Kyangombe area. From the survey conducted in the area, there are only four infrastructural services provided in the area. These include a girl’s secondary school, a market, public water supply infrastructure, and a road network system presenting a false hierarchy of roads within an urban setup. According to standards as guided by the health service provision, physical planning standards and norms (Government of Kenya, 2007:2016), Kyangombe, with an approximate population of 85,316 (KPHC,2020), should have three secondary schools, seventeen primary schools, thirty four preprimary schools three health centers, nine dispensaries, and seventeen clinics with public water supply and sewer system. Additionall, Kyangombe should be having a neighbourhood level park with pocket parks within a half a kilometer radius of various clusters. Despite this expectation, observation and mapping. Kyangombe reveals a shortage in the provision of such basic infrastructure. Table 6 indicates the availability of infrastructure in Kyangombe.

Table 6: Kyangombe’s level of contribution to the provision of infrastructure

Public Infrastructure type	Level	Expected number based on population	Score per service (point)	Maximum Score @ each service (points)	Existing number	Score
Schools	Secondary	3	10	30	1	10
	Primary	17	10	170	0	0
	Pre-primary	34	10	340	0	0
Health facilities	Health center	3	10	30	0	0
	Dispensary	9	10	90	0	0
	Clinic	17	10	170	0	0
Public water Supply	Town Water reticulation system	1	10	10	1	10
Open spaces/ Playgrounds	Neighborhood	1	10	10	0	
Sewer System	Town level	1	10	10	0	0
Solid waste management	Neighborhood	1	10	10	0	
Cemetery	Town	1	10	10	0	0
Security facility	Police post	1	10	10	0	0
Total				890		20

Source: Field Survey, 2020.

As regards the weighting criteria in this study, Kyangombe only scores 20 out of the possible 890 points that is equivalent to 2 % in achieving public interest. Since coordinated physical and land use planning was not part of the process that delivered the land in Kyangombe for urban development. The public interest was not considered. Instead, the private interest on maximization of profit sufficed. The land was delivered incrementally, based on need as was driven by the market forces. In that instance, therefore, only that infrastructure such as roads were provided for with compromised standards. The roads were provided for because the subdivision guidelines required all land parcels to have access (Government of Kenya, 1968). Otherwise, other basic infrastructural services both social and physical were not in the interest of the private developers to invest in. It is clear that this model does not optimize public interest in providing infrastructure.

Furthermore, the development process in the area reveals that approvals are granted for development. However, the development control that is undertaken in the area is uncoordinated and are not based on any planning framework, hence discretionary and informal. With this development process, the emerging development pattern is informal, with deficiencies in the provision of social and physical infrastructure. Such development processes do not look into the bigger picture of the urban pattern regarding standards and norms of social and physical infrastructure provision based on population projections and land use densities. The undesirability of such development pattern identified in Kyangombe and their related causes are, drawing from the legal validity area as similar to the finding gathered by Robert Home (2012) and Ayonga's (2019) findings on infrastructure provision in an informal model.

iii. Chuna (Semi-Formal /Cooperative Model)

Chuna area was incorporated into the urban area through the land control board with the development proponents being Chuna SACCO. The SACCOs operated under the cooperatives legal framework Cooperatives up to the year 2010. Currently, the SACCOs operate within the framework of SACCO Societies Act, Cap 490B. The land was availed for urban development through land subdivision.

According to the key informant interviews conducted with the County Director in charge of urban development in Kajiado, and document examination, the development process drew its legitimacy from the consent granted by the Land Controls Board and approval by the local authority (Olkejuado County Council) that was in charge of controlling development in the area. The land was divided among its members who then developed the land for various uses. As an organization whose concern is on social and economic interest of its members, the Sacco formulated its own regulations and development conditions that were applicable only to its members and hence not applicable to the non-subscribers of its constitution. It is, therefore, a semi-formal model that follows the path similar to Kyangombe with variation being on the availability of by laws that could modify the land delivery process.

The opportunity to modify the land delivery process indicate some element of rational allocation of social and physical infrastructure with a graduated (hierarchy) road network, schools, open spaces, police post and piped water supply system. However, these

allocations were done in the interest of Chuna members and so non-rivalrous but excludable to the public. Additionally, the key informant interviews conducted with the officers from the planning department in Kajiado County in the year 2020, revealed that the requirement that such a scale of subdivision (over 20 acres) and nature of the intended development require facilities such as playground, schools and waste management infrastructure. The land that was allocated for such facilities though registered under an individual or a group of members within the SACCO who would then provide the service. In essence, such infrastructural services will be private and exclusionary. Because of the aforementioned reason, the observation and mapping of the area reveals that there are three private primary schools, private health clinic, police post, and private water supply system.

According to the established standards and norms in this study, with a population of approximately 5,884 (KPHC, 2020), Chuna is supposed to have the public infrastructure that are outlined in table 7. In contrast, the observation and mapping of the area indicates little provision of public social and physical infrastructure in Chuna area. The only existing public infrastructure include police post and the road network system.

Table 7: Chuna's level of provision of public infrastructure

Public Infrastructure type	Level	Expected number based on population	Score per service (point)	Maximum Score @ each service (points)	Existing number	Score
Schools	Secondary	1	10	10	0	0
	Primary	1	10	10	0	0
	Pre-primary	2	10	20	0	0
Health facilities	Health center	1	10	10	0	0
	Dispensary	1	10	10	0	0
	Clinic	1	10	10	0	0
Public water Supply	Town Water reticulation system	1	10	10	0	0
Open spaces/ Playgrounds	Neighborhood	1	10	10	0	
Sewer System	Town level	1	10	10	0	0
Solid waste management	Neighborhood	1	10	10	0	
Cemetery	Town	1	10	10	0	0
Security facility	Police post	1	10	10	1	10
Total				130		10

Source: Field Survey, 2020.

Chuna scores only ten (10) points out of the maximum possible points of 130 based on the weighting criteria. The points are equivalent to eight percent (8%) level of provision of physical and social infrastructure. This score is with reference to public social and physical

infrastructure. On the other hand, Chuna has additional seventy (70) points of private social and physical infrastructure on the following area:

- | | |
|-------------------------|-----------------------------|
| i. Private water supply | v. Playground |
| ii. Sewer management, | vi. Clinic |
| iii. Primary school | vii. Solid waste management |
| iv. Pre-primary school | |

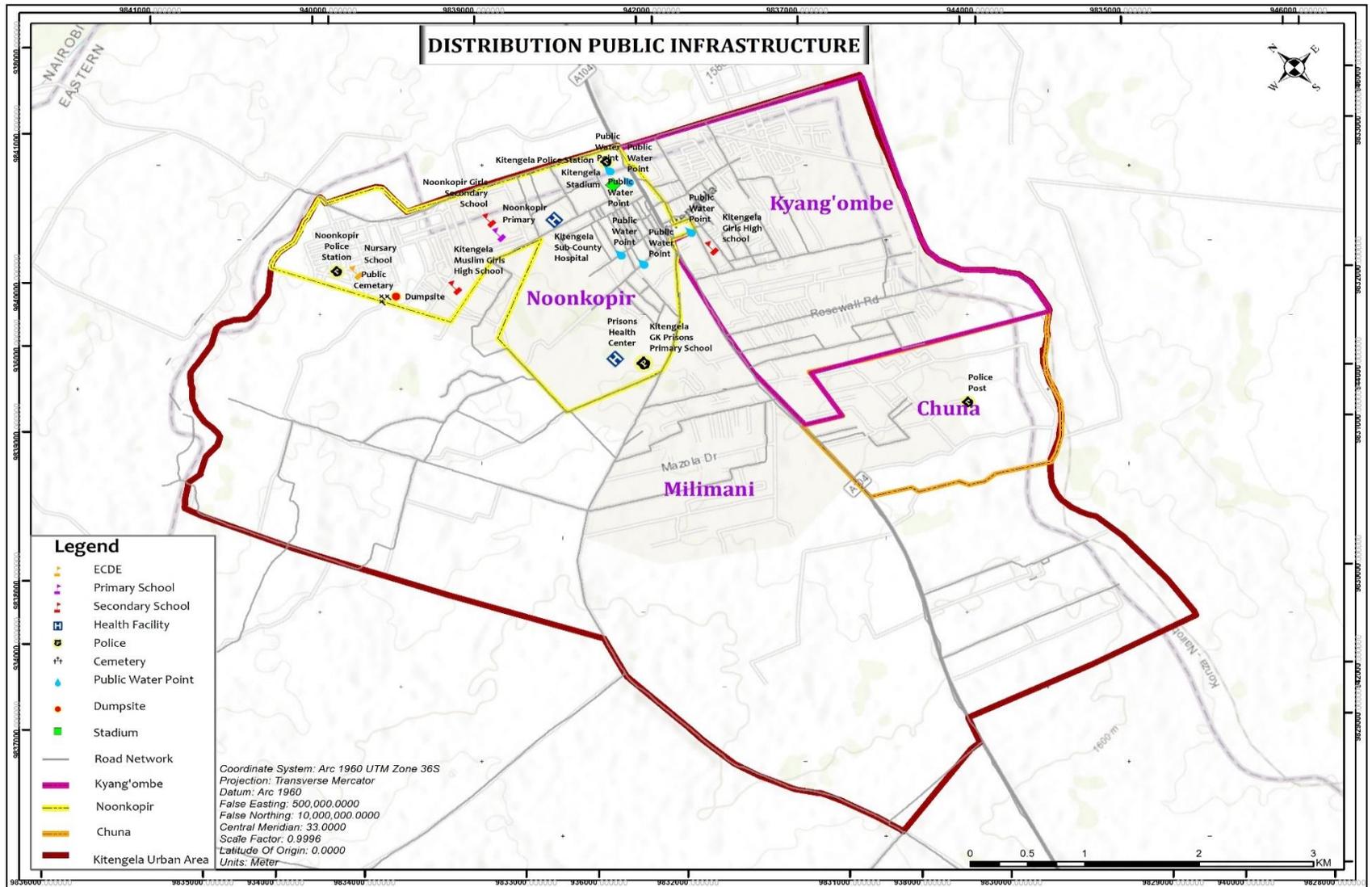
Therefore, it means that the cooperatives developed by-laws to govern their interest in the area for their livability. However, the exclusionary measures put on the social and physical infrastructure in the area make them private and not public infrastructure since the government is not the service provider. Additionally, the cooperatives' regulations on infrastructure provision and development control cannot be sanctioned by the government or in a court of law. In the view of this study, this phenomenon reveals the concerns about public welfare, which the government has failed to safeguard, and that those who are financially able can attempt to provide for their own in exclusionary terms.

Chuna deviates from the ideal land delivery model in three ways. Firstly, the planning authority did not prepare the plan for the area. Secondly, the allocation of infrastructural services was not done in the public interest but in the interest of the cooperative members, hence exclusionary to the public. Finally, the tenure system within which the land was allocated was freehold which hider implementation and sanctioning of development and planning regulations. Consequently, optimization of infrastructure in the interest of the public is not achievable in such a model.

Map 4 summarizes the availability of the various infrastructure in the three areas that were surveyed in Kitengela. The map also shows the location of the various infrastructure in Kitengela to demonstrate the deficiencies in the distribution of physical and social infrastructure in the study area.

Based on the existing land delivery models in Kitengela, it is conclusive that none of the models optimizes the provision of physical and social infrastructure. They all deviate from the ideal land delivery model, which incorporates planning at the initial stages to allocate land for infrastructure provision based on the standards and norms with the envisioned population to be serviced by the various infrastructure.

Map 4: Distribution of existing infrastructure in the study area



Source: Author's edits, 2020

5.4.1 Coping Mechanism

This study established the following coping mechanisms adapted by the residents of Kitengela in the context of deficiency in the social and physical infrastructure.

i. Longdistance to access infrastructural services

The residents of Kitengela have to walk long distance to access social and physical infrastructure. According to the household interviews conducted in Kitengela, it was established that the residents have to cover long distance to access both physical and social infrastructure.

Mapping and observation indicate that there is no public education facility within Chuna area. In Kyangombe, there is only one secondary school while in Noonkopir; there are two secondary schools and two primary schools. From the household survey conducted, 35 households interviewed in Chuna cover over 2 kilometers on average to access the nearest public education facility.

In Kyangombe, the 55 households interviewed cover over 1 kilometer to access public education facility. Furthermore, for pre-primary and primary schools the children have to get to Noonkopir Primary school, which is over 2 kilometers from Kyangombe area.

In Noonkopir, only 19 households interviewed travel beyond 1 kilometer to access the public education facilities. The average distances by clusters is summarized in table 8.

This distance is beyond the recommended standard of neighbourhoods that should not be more than one and a half miles.

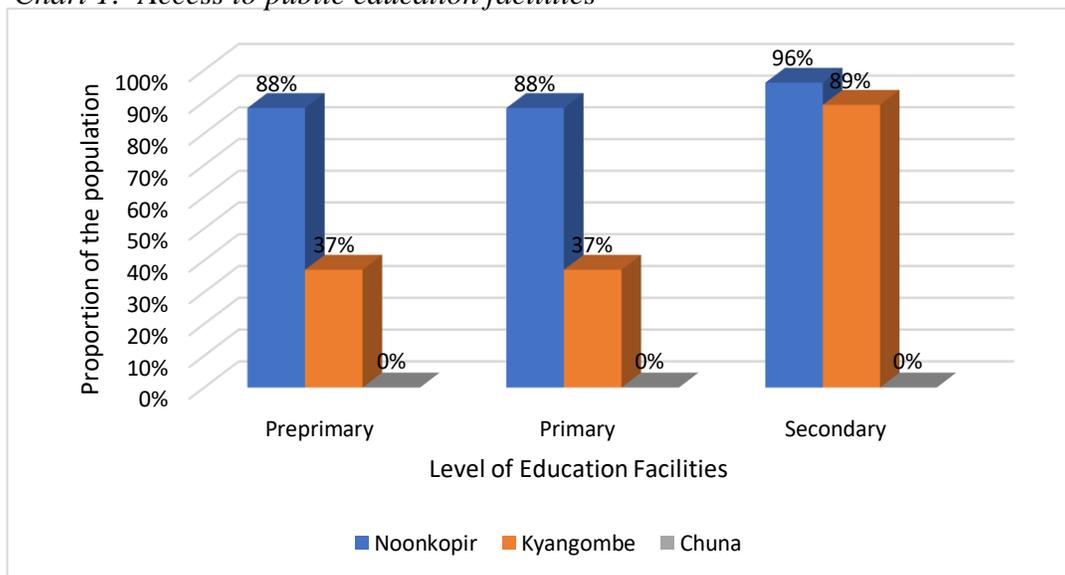
Table 8: Proximity to public education facilities

Locality	Distance Ranges (Km) to the public education facility		
	0-0.5	0.6-1	Over 1
Noonkopir	24%	42%	34%
Kyangombe	0%	0%	100%
Chuna	0	0	100%

Source, field survey, 2020

Based on the long distance, and proximity analysis done in Kitengela, of all the interviews conducted, 79 households can access public educational facility despite the long distances that characterize them. Therefore, it means that the general accessibility to public education facilities in Kitengela is at 61%. The established level of access depicts non-optimal provision. Urban areas should have one hundred percent access to education facilities within the given standards (Government of Kenya, 2012). Further, the level of access to public education facilities in the sub-areas within Kitengela is as illustrated in chart 1. From the findings presented in chart 1, Noonkopir area has the highest access to public education facilities while Chuna has completely no access.

Chart 1: Access to public education facilities



Source, field survey, 2020

The long distance to access health infrastructure was inherent in the whole of the study area. The study established that 112 households interviewed in Kitengela as a whole cover two kilometers and below to access health facility. This is equivalent to eighty-six (86%) of the households, while fourteen percent (14%) covering over two (>2km) kilometers. In Chuna, one has to cover over 3 km. However, this access is based on the distributive aspect. Furthermore, table 9 indicates the variation in access at the locality levels.

Table 9: Proximity to existing health facilities

Locality	Distance Range to the public health facility	
	0-2 km	Over 2 km
Noonkopir	94%	6%
Kyangombe	39%	61%
Chuna	0	0

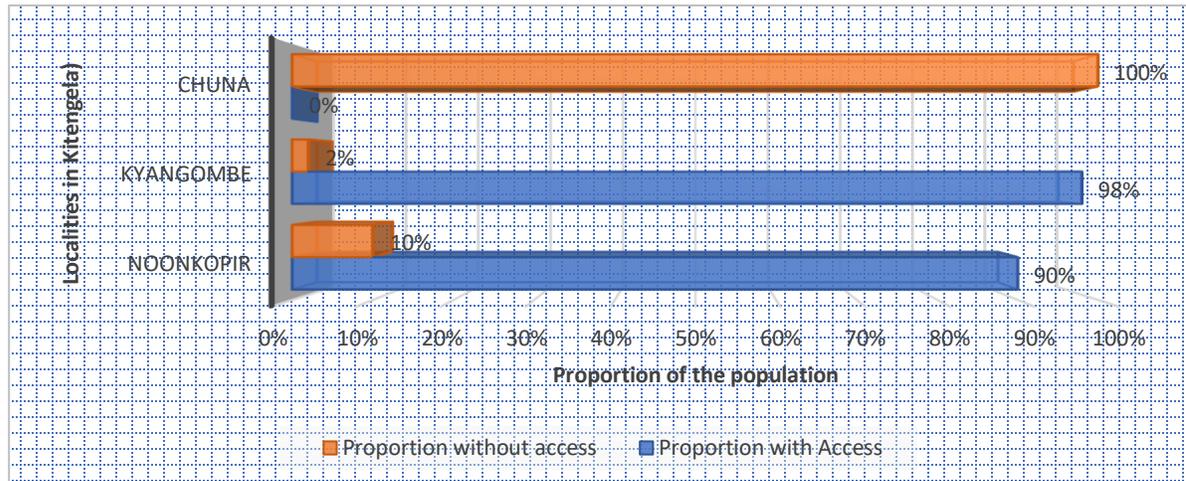
Source, field survey, 2020

Observation in the field survey, 2020 revealed that the only existing health facility in Kitengela is a sub-county hospital. The sub-county hospital is a referral public health facility and not a basic health facility. At sub-county level, the health facility is established to provide health service to the whole of the sub county that it serve.

The household survey conducted established that 117 households out of 130 sampled and interviewed accessed the public health facility. This shows that the level of access to public health facilities was at ninety percent (90%) in Kitengela as a whole. However, none of the households in Chuna accesses the health facility. The hospital, despite its location in

Noonkopir area, serves the sub-county population and beyond. In each locality in Kitengela, access to health facilities indicates that Kyangombe and Noonkopir area residence has a higher level of access to public health facilities than the Chuna area, with the least access to public health facility, which was at 0% based on the survey conducted. Chart 2 presents a summary of the findings on access to health facility by households in the various clusters.

Chart 2: Levels of access to public health facilities according to household survey

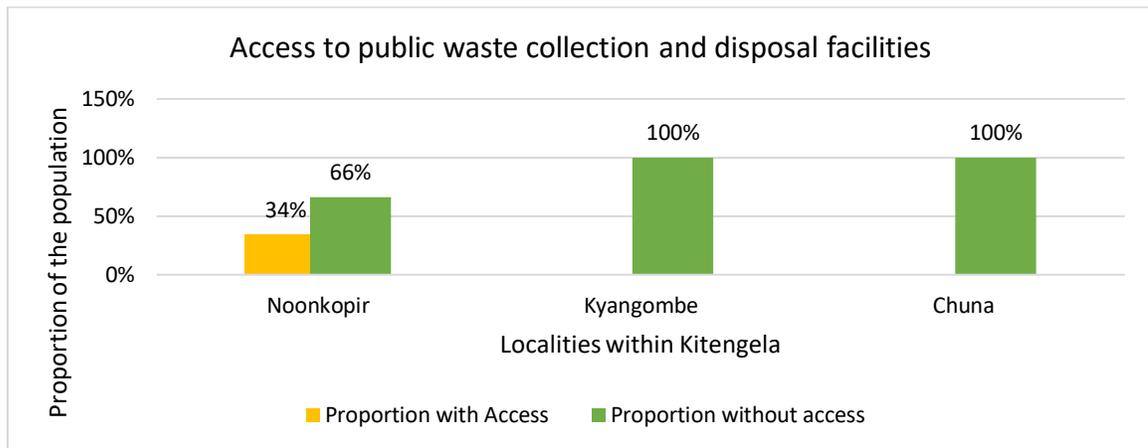


Source, field survey, 2020

On solid waste management infrastructure, the results from household survey shows that the average distance covered by the households to the nearest solid waste management facility is 2.5 km. Within the areas focused on, the average distance to the nearest dumpsite is 0.9 km in Noonkopir. In the Kyangombe area, the average distance is 2 kilometers. In comparison, in Chuna the average distance to the nearest public waste management facility is 4.6 km. The existing solid waste management facility in Kitengela is located in Noonkopir with no other solid waste management facilities in the other neighbourhoods. Base on the existing situation, the existing water management infrastructure in Kitengela is not at the neighborhood level infrastructure; consequently, the study further established that out of the households interviewed only 22 access the facility to dispose the waste. In percentage, the accessibility level solid waste management infrastructure translates to seventeen percent (17%). The distribution of access to public waste management infrastructure by the neighbourhoods surveyed is summarized in chart 3. If those in Kyangombe and Chuna have to use the existing public waste management infrastructure, then they have to cover long distance of over 3 km with reference to the location of the infrastructure as shown in map 4.

Within the neighborhood planning concept, it is required that the services should be within one and a half miles radius.

Chart 3: Access to the public solid waste management infrastructure

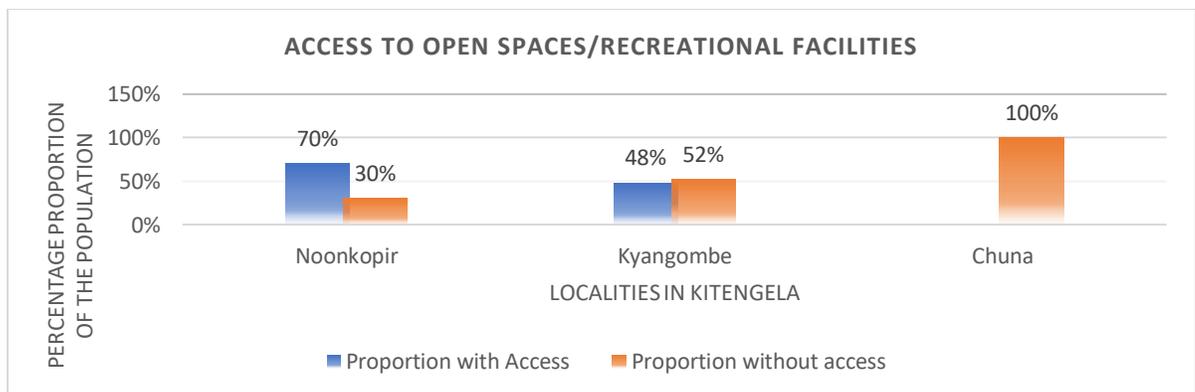


Source, field survey, 2020

Despite the existence of a public open space in Kitengela as established through mapping and observation. The existing stadium as a public open space infrastructure serves a town level role and not a neighbourhood's role. Though it has the capacity to serve the neighborhood level function those within Noonkopir can access the infrastructure while those in Kyangombe and Chuna Have to cover a relatively longer distance beyond the recommended level of up to 2.4 km (Gallion, 1950). According to the household survey conducted, 74 households were able to have access to the public open space. The finding implies that on average, 57% of the residents in Kitengela have access to public open space/playground. However, 47% percent of the households sighted long distance as a hindrance to their access to the public open space.

Based on the neighbourhoods that this study focused on, there was an establishment 70% that (28 households out of 40 sampled) of the households in Noonkopir, 48% (26 households out of 55 sampled) in Kyangombe, and none of the households in Chuna have access to the public playground, recreational space, or open space. The findings are as summarized in chart 4. The accessibility here is hindered by the distance that the resident has to cover to get to the public infrastructure.

Chart 4 Access to public open space/ playground/recreational facilities by localities:



Source, field survey, 2020

The residents of Chuna have no access to the public recreational infrastructure since they are furthest as shown in map 4.

On the proximity of recreational facilities/open spaces, the distance covered by households in Kitengela as per the localities is as summarized in table 6. Based on the hierarchy of service provision at lower, medium and higher level of recreational service provision within residential areas. The summary of findings is as presented in table 10.

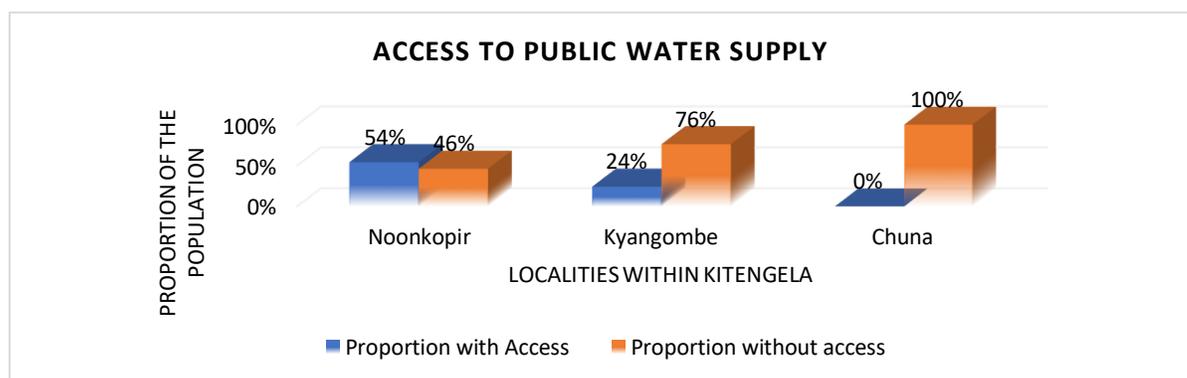
Table 10: Distance to open space recreation facility

Locality	Distance Ranges (Km) to the recreation education facility		
	0-0.5	0.6-2	Over 2
Noonkopir	40%	60%	0%
Kyangombe	0%	73%	27%
Chuna	0	0	100%

Source, field survey, 2020

On access to public water supply in Kitengela, the mapping indicates skewed distribution with biasedness to two neighbourhoods. Only Noonkopir and Kyangombe areas have access to public water supply services with the variations in access as indicated in chart 5. According to the household survey conducted, Noonkopir is the most supplied locality with fifty-four percent (54%) access, while Chuna has zero access to public water supply. According to the household survey conducted the responses from the various households indicate that the access to public water supply is limited with levels varying as presented in chart 5. Further, the interview with the director in charge of urban development in the county revealed that the water supply system that exist in Kitengela were community water points distributed mainly in Noonkopir. The distribution is skewed in that manner and hence, those who are not close to the established community water points have to cover long distance to access the service. The household survey further proved this situation where by 60% of the households that relay on public water supply have to cover over 1 km to access water which is not accepted based on neighborhood planning standard (one community water point of a capacity of 7 l/s should serve a population of 500) (Government of Kenya, 2016).

Chart 5: Access to public water supply infrastructure



Source, field survey, 2020

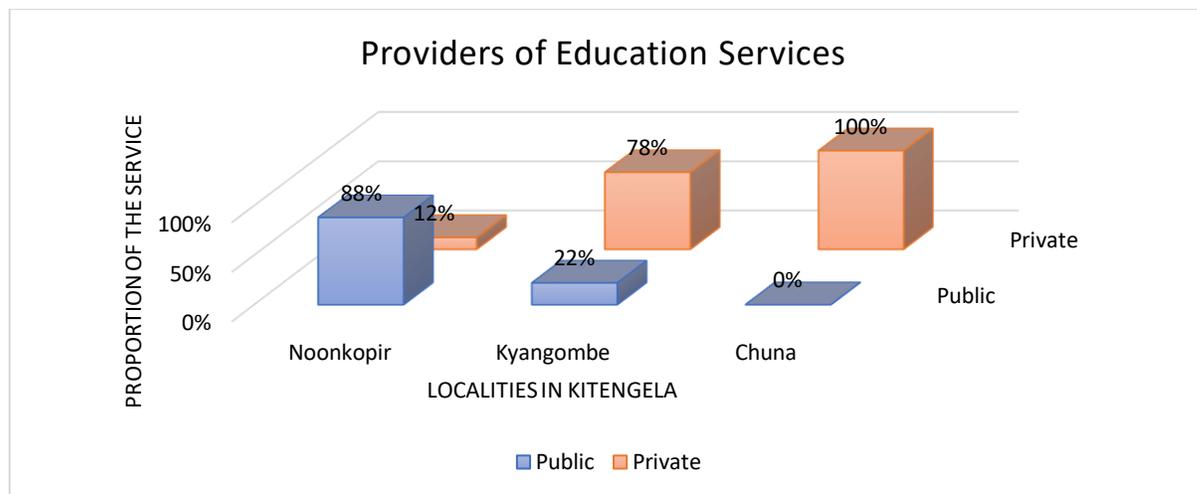
ii. Residents in Kitengela have to get infrastructural services from the private sector

The survey in Kitengela revealed that the private sector service providers bridge the gap created by deficiency in public social and physical infrastructure. The interview conducted with the county director in charge of urban development in Kajiado County revealed that in the absence of the basic social and physical infrastructure in the neighborhood, the investors in the private sector see a business opportunity. They seek licenses and development approval to provide some of the social and physical infrastructure such as education, health, water supply, waste collection and disposal, security and even recreational spaces. However, these services are to be bought by the residents at the market rates. Additionally, the study observed that water supply in Chuna is by the private sector to all the residential units. The residents handle waste collection in all the neighbourhoods privately; liquid waste management is purely in the hands of the developers and the residents and recreational services.

The observation made from the survey was further re-emphasized by the household surveys conducted in the neighbourhoods whose outcomes were as follows:

Generally, the public service sector only holds the market share of 54% of the education service provision in Kitengela. This percentage was equivalent to 70 out of 130 households sampled and interviewed. At the neighbourhood level, the distribution of the private and public share of education service provision is as presented in chart 6. It is worth mentioning that only Noonkopir area enjoys the service offered by the public sector in education..

Chart 6: Education service providers



Source, field survey, 2020

It was also established in this study that; the provision of health service is 87% (113 out of 130 households sampled and interviewed) public. However, there are variations in how the residents seek health services in the area, as presented in table 12. The findings show that all the residents in the Chuna area depend on private service providers while the public health facilities highly serve Kyangombe and Chuna.

Table 11: Service providers in the health

Locality	Public	Private
Noonkopir	90%	10%
Kyangombe	91%	9%
Chuna	0%	100%

Source, field survey, 2020

On recreation, the survey revealed that the level of access to public recreational facilities in Kitengela is 36%. At the neighbourhood level, Chuna and Kyangombe highly depend on the private sector for recreation services. The statistics on who provides the households with the recreational services are as presented in table 13.

Table 12: Service providers in recreational services

Locality	Service provider	
	Public	Private
Noonkopir	66%	34%
Kyangombe	7%	93%
Chuna	0%	100%

Source, field survey, 2020

The provision of solid waste management services in Kitengela is dominated by the private sector. The survey results show that in Noonkopir, 14 out of the 40 households interviewed dispose solid waste in the designated public solid waste management site while the rest (26) of the households interviewed depend on the private sector collection. In Chuna, the solid waste collection service is purely (100%) offered by the private sector, while in Noonkopir the private sector service 34% of the households. The details are presented in table 14.

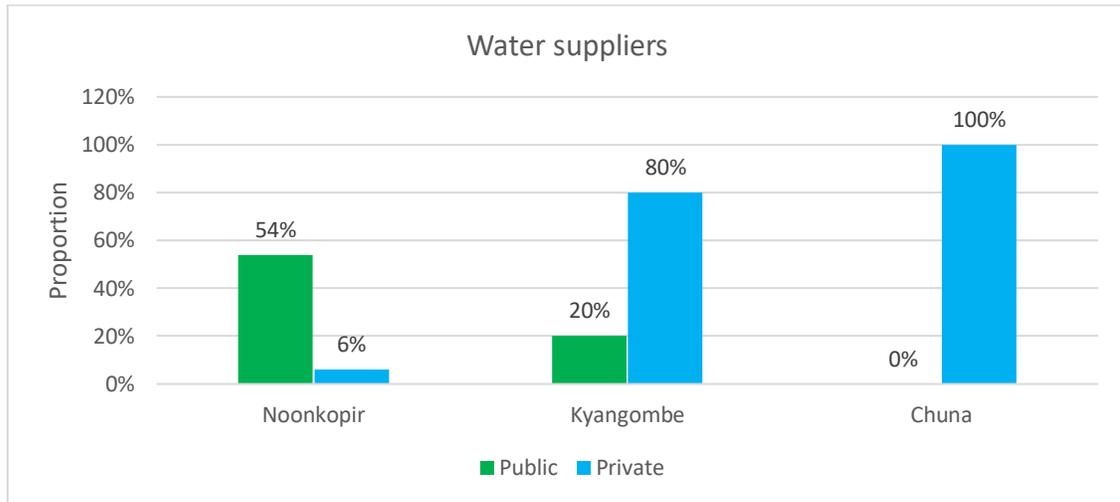
Table 13: Providers of solid waste collection and disposal services

Locality	Public	Private
Noonkopir	66%	34%
Kyangombe	7%	93%
Chuna	0%	100%

Source, field survey, 2020

The study in Kitegela also established that public water supply was only provided selectively. The Key informant interview with the chairman of the Land Control Board – Isinya adjudication area revealed that water infrastructure was limitedly provided in Noonkopir area. He further added that, the existing network in Kyangombe area is an initiative of the private developers and investors to connect their property to the existing water main that serves the EPZ in Athiriver. Household survey further revealed that 74% of the households interviewed in the whole of Kitengela during the field survey access their water from private investors. The only area with the highest access to public water supply service is Noonkopir at 54% (where by 22 out of 40 households interviewed access their water from public water supply infrastructure provided within the neighbourhood. Chart 7 summarizes the state of water service provision in the localities studied in Kitengela.

Chart 7: Water Service providers



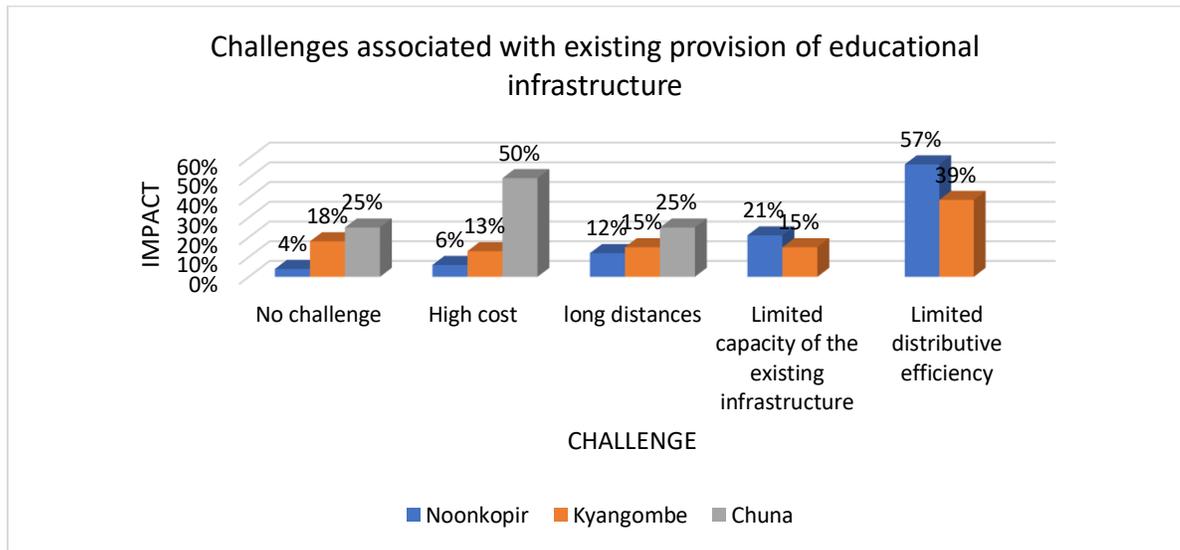
Source, field survey, 2020

iii. Residents incur high cost of infrastructure services

Physical and social infrastructure provided for in an ideal land delivery model are part of the development process of the urban area. It is always cheaper to provide these services since the government subsidizes them. It was also established that it is the government’s duty and responsibility to provide physical and social infrastructure in the interest of the public. When the land was not provided at the stage where the land was being availed for urban development, the cost of providing such infrastructure is always high. When the cost of these services are high, the public feel the weight and dig deep into their pockets. Since the public pre-primary and primary schools in the study area are deficient as established in the weighting tables presented earlier in this chapter, parents opt to take their children to the private schools that are available.

The established challenges associated with the current provision of education facilities are presented in Chart 8. The findings show that there are those challenges that are endemic to the areas with infrastructure availability and those associated with a total lack of education infrastructure. For example, in Chuna, there are no concerns about the distribution and capacity of the existing facilities since they rely on the private sector as their service provider. On average, at the preprimary level, parents have to pay an average of approximately Ksh 60,000 annually for a pupil, approximately 80,000 for a pupil in primary school in Chuna. On the other hand, Children attending preprimary and primary school in Kyangombe pay an average of 40,000 and 60,000 annually respectively. And finally those in Noonkopir pay an average of 20,000 annually for preprimary and 35,000 annually for primary school education in the private schools. This rate is higher than the recommended fee guidelines for day schools at the secondary school levels- by the ministry of education-which is approximately ksh. 22,300 (Government of Kenya, 2020). At this rate the cost of education that parents have to cope with in Kitengela is relatively high. Additionally, from the household survey high cost of education emerged as one of the main problem in Chuna and Kyangombe, as compared to other challenges as outlined in chart 8.

Chart 8: Challenges associated with existing provision of educational infrastructure

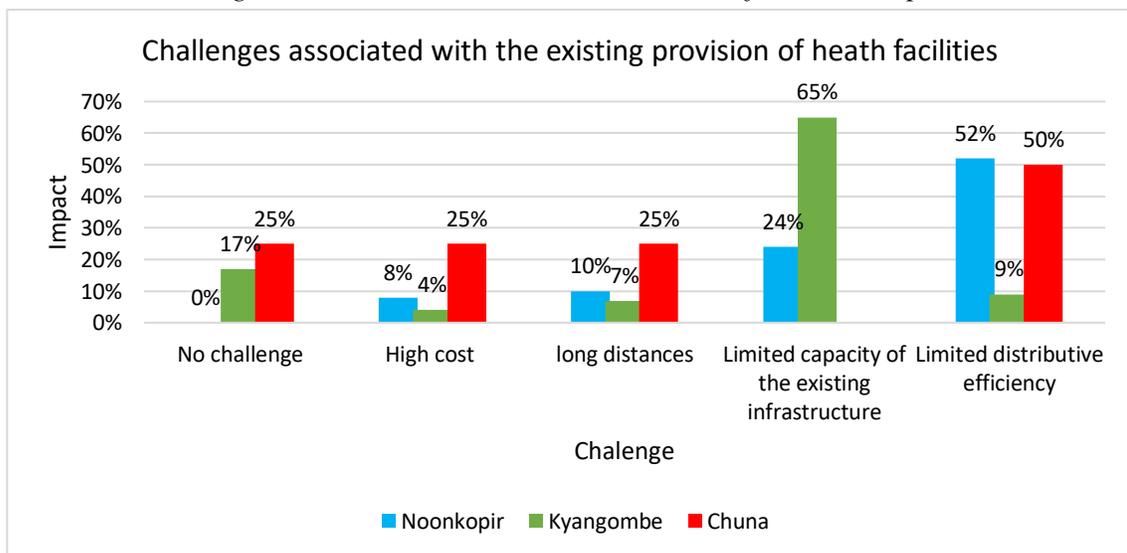


Source, field survey, 2020

According to the responses gathered in this study, the main challenges associated with health infrastructure provision include the high cost of health services for those that rely on the private sector. For example the cost of testing malaria in private clinic in Kitengela is charged at a fee of Ksh 300 in addition to ksh. 300 consultation fees. In comparison to the public health facility, where there is no consultation fees and the malaria testing fees ranges ksh 150-200.

The household survey revealed that apart from the economic cost of health services, there are other costs in terms of energy and time consumed while accessing the health infrastructure services in Kitengela where the model in which they are delivered is non-optimal. These costs are in form of challenges summarised in chart 9.

Chart 9: Challenges associated with the current health infrastructure provision.



Source, field survey, 2020

The cost of accessing recreational services is equally high in Kitengela since the infrastructure was not provided based on norms and standards for provision both at the neighbourhood and town level. Residents who can afford to take their children to the privately developed recreational parks in form of theme parks (that are currently emerging as an economy in the area) often take their children to enjoy leisure. The cost of getting the service for one child per day is almost Ksh. 500. Within these spaces the children get to play with artificial things that keep them engaged. In contrast those who cannot afford the Ksh. 500 and above have to forgo this opportunity. This rate is high and exploitative since if the infrastructure was put in place within the neighbourhoods, the children could equally enjoy the service either free or at a very subsidised cost that is affordable to the general public. Other factors which make access to recreational service costly include long distances to access recreational services, lack of recreational services within the sub-areas within Kitengela, and inadequate distribution of recreational facilities in the area as was identified in the household survey. Table 15 disaggregates the challenges according to the neighbourhoods examined in the study area.

Table 14: Challenges associated with the provision of public open spaces

Challenge	Localities in Kitengela		
	Noonkopir	Kyangombe	Chuna
No challenge	40%	18%	
Long-distance to access recreational facility	29%	30%	
Lack of recreational facility in the area	20%	26%	100%
Inadequacy in the distribution of the recreational facilities	11%	26%	
Total	100%	100%	100%

Source, field survey, 2020

On solid waste the cost of managing solid waste is relatively high in Kitengela. The study established that the residents who live in the rental premises have to pay a monthly fee ranging ksh 150-200. This is due to the fact that there are undesignated public waste management sites (infrastructure) at the neighbourhood level. It's only the private waste collection companies and 34% of the residents who can access the town level waste disposal site. This rate is high as compared to the municipal waste management approaches where residents pay land rates and rents while they get services like waste collection in the exchange of rate charges. According to the household survey conducted in the areas of Kyangombe, Chuna and Noonkopir, 54 % of the households interviewed feel that the cost of waste management is high while in Chuna 25% hold the same opinion. In Noonkopir the cost is not viewed as the main problem since the town level solid waste management infrastructure is located within Noonkopir as shown in map 4. Other costs in the form of challenges that translates in to time cost, energy cost and environmental cost are summarized in table 16. Though indirect but they are costs that the residents in Kitengela incur as they cope with the deficiency in the infrastructure provision that is associated with the model in which the land for urban development was delivered .

Table 15: Challenges associated with the provision of waste management infrastructure

	Challenge	Localities in Kitengela		
		Noonkopir	Kyangombe	Chuna
1.	No challenge	23%	11%	50%
2.	No designated waste management sites	37%	35%	25%
3.	The high cost of waste management by the private sector	24%	54%	25%
4.	Long distance to access the existing facility	16%	-	-
	Total	100%	100%	100%

Source, field survey, 2020

Resident in Kitengeal also have to pay for water at a relatively higher cost in comparison to the rate at which the government supplies water. The field survey revealed that residents in Kitengela buy water at Ksh. 1500 per 1m³ of fresh water and Ksh.150-200 for borehole water which is saline by its chemical characteristic. These rates are way higher as compared to the Water service providers such as Nairobi Water and Sanitation Company Ltd, that sells fresh water at Ksh. 204 per 1m³. This rate reduces depending on the number of users. The lowest rate is at Ksh. 54 for 7-60 users (NAWASCO, 2020). Other costs that are paid by the residents presented as challenges were established as presented in table 17.

Table 16: Challenges associated with the provision of water infrastructure

	Challenge	Localities in Kitengela		
		Noonkopir	Kyangombe	Chuna
1.	The high cost of water provided by the private sector	29%	28%	50%
2.	The low quality of water is characterized by salinity.	37%	26%	50%
3.	Unreliable water supply	31%	22%	
4.	Lack of public water reticulation	20%	9%	
5.	No challenge	6%	15%	
6.	Long distance to access water	14%		
	Total	100%	100%	100%

Source, field survey, 2020

On matters liquid waste management, the residents in Kitengeal have to rely on pitlatrines and septic tanks since there was no functional public sewer system. The pit latrines get filled up with waste. According to the interview conducted with the developers in Kitengela, 4 out of 20 stated that some pit latrines are emptied while some are abandoned and new ones are constructed. In such a case the developer incurs another cost of putting up a new pit latrine which ranges from Ksh.50,000 to 100,000 depending on the material used and the type of the

underlying soils and rocks. On the other hand the use of exhauster to empty the pits costs up to Ksh 12,000.

The cost is even higher when one owns a multistorey rental apartment. The rate at which the septic tank gets full is dependent on the amount of liquid waste generated per day. An interview with property owner in Kyangombe revealed that an a partment with over a hundred families is likely to offload a septic tank every two weeks. That means that the property owner will be spending approximately Ksh 24,000 every month. This rate is higher compared to the municipal sewarege service provision that is subsidised and charged as a fraction of the water supply service.

To establish a retroactive way of providing infrastructure in an area that has developed within an uncoordinated development framework, the study sought opinions from the respondents engaged in the survey conducted in Kitengela. The finding indicates that the residents have to rely on the private sector when the public infrastructural service provision is not optimized. Consequently, there is a high cost of accessing the infrastructural services. The findings are as indicated in table 18.

Table 17: Existing coping mechanisms by residents

	Challenge	Localities in Kitengela		
		Noonkopir	Kyangombe	Chuna
1.	Procure the services at a high cost from the private service providers	71%	74%	100%
2.	Rely on the government despite the deficiencies	29%	26%	
	Total	100%	100%	100%

Source, field survey, 2020

Furthermore, according to the Director in charge of urban development in Kajiado County, access to infrastructure was mainly a concern in Noonkopir area, whose development was pre-planned but did not align to the formal pre-planned model. The Director further added that the rest of the areas have to cope with the market system of allocation of land use since the development proponents see opportunities created by the formal unplanned land delivery models. In the end, the cost of living is raised due to the high cost of provision of infrastructural services with qualities compromised sometimes.

The recommendations related to the people's opinions as established in the survey were that, it should be the government's responsibility to ensure that development in the urban area of Kitengela fulfills public interest requirements. The sample interviewed in Kitengela shows that 80% of the residents recommended that the government provide the basic infrastructure services. Additionally, the key informants interviewed, such as the director in charge of urban development in Kajiado County, made the recommendations that the government should focus on redeveloping Kitengela before it's too late. The redevelopment contemplated by the Director, in this case, was to acquire the areas that have emerged out of the organic model and re-plan them before re-allocation them when the infrastructure provision is optimized.

Additionally, it was recommended that the government should take firm control in managing urban development so that the power that rests in the development control agencies is not compromised. There are freedom and impact in exercising such powers to ensure livable urban places with public interest championed.

5.4.2 Hypothesis Testing

This section presents a statistical test using Chi-Square to test the hypothesis of the study. The test was based on measuring six variables with values that could be used to measure the association between the urban land delivery model represented by localities in Kitengela and the level of infrastructure provision. These variables include the three localities of Noonkopir, Kyangombe, and Chuna area and their relationship with the provision of public schools, public health facility, Public Playground/Recreational Space, Public Waste collection/Disposal site, Police station/post, and public water supply. All the tests conducted; the confidence level selected since this is social research was 95% with a significance level of 0.05 (5%). Sproull (1995) supports this selection.

Hypothesis Testing One

H_0 = Deficiency access to public schools in an urban area does not mean that the predominant urban land delivery model is unplanned (*laissez-faire* or market-driven).

Table 18: Hypothesis testing on public schools and land delivery model

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32.756 ^a	2	.000
Likelihood Ratio	36.455	2	.000
N of Valid Cases	130		

Source: Author, 2020

The p-value computed (0.000) is less than 0.05, indicating that a significant difference exists. Therefore, the null hypothesis is rejected. The study hypothesis that deficiency in access to public schools in an urban area could mean that the predominant urban land delivery model is unplanned (*laissez-faire* or market-driven) is supported. There is a 95% probability that this conclusion is correct.

Hypothesis Testing Two

H_0 = Deficiency access to public health facilities in an urban area does not mean that the predominant urban land delivery model is unplanned (*laissez-faire* or market-driven).

Table 19: Hypothesis testing on public health facility and land delivery model

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	39.130 ^a	2	.000
Likelihood Ratio	22.873	2	.000
N of Valid Cases	130		

Source Author, 2020

The p-value computed (0.000) is less than 0.05, indicating that a significant difference exists. Therefore, the null hypothesis is rejected. The study hypothesis that deficiency in access to public health facilities in an urban area could mean that the predominant urban land delivery model is unplanned (*laissez-faire* or market-driven) is supported. There is a 95% probability that this conclusion is correct.

Hypothesis Testing Three

H₀= Deficiency access to Public Waste collection/disposal site in an urban area does not mean that the predominant urban land delivery model is unplanned (*laissez-faire* or market-driven).

Table 20: Hypothesis testing on public waste collection and land delivery model

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.482 ^a	2	.000
Likelihood Ratio	27.074	2	.000
N of Valid Cases	130		

Source Author, 2020

The p-value computed (0.000) is less than 0.05, indicating that a significant difference exists. Therefore, the null hypothesis is rejected. The study hypothesis that deficiency in access to Public Waste collection/Disposal site (facility) in an urban area could mean that the predominant urban land delivery model is unplanned (*laissez-faire* or market-driven) is supported. There is a 95% probability that this conclusion is correct.

Hypothesis Testing Four

H₀= Deficiency access to public water supply in an urban area does not mean that the predominant urban land delivery model is unplanned (*laissez-faire* or market-driven).

Table 21: Hypothesis testing on public water supply and land delivery model

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.759 ^a	2	.003
Likelihood Ratio	13.212	2	.001
N of Valid Cases	130		

Source Author, 2020

The p-value computed (0.003) is less than 0.05, indicating that a significant difference exists. Therefore, the null hypothesis is rejected. The study hypothesis that deficiency in access to public water supply in an urban area could mean that the predominant urban land delivery model is unplanned (*laissez-faire* or market driven) is supported. There is a 95% probability that this conclusion is correct.

Out of the four statistical tests conducted on variables that were being measured in this study, the null hypothesis is rejected in all the cases. In other words, four statistical tests revealed that the study's p-value is less than 0.05 indicating that there is significant difference existing among the variables. On this basis, the null hypothesis is rejected. Therefore, it means that the study hypothesis that deficiency in access to public social and physical infrastructure in an urban area could mean that the predominant urban land delivery model is unplanned (*laissez-faire* or market-driven) is supported. There is a 95% probability that this conclusion is correct. The finding of this study, concur with the findings of Hall (1992), Baker (2002), Home (2012 and Ayonga (2019), who found out that if planning is not effectively instituted and plans firmly implemented then deficiency in infrastructure is inherent. It also justifies that optimal infrastructure provision has direct relationship with effective planning (preplanned land delivery model).

6. CHAPTER SIX - SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

6.1 Overview

A standpoint derived logically from evidence gathered from various sources to answer the central question in a thesis is very key. This section concludes the findings on literature and the validation of the same findings through a field survey. The chapter also presents possible solutions to the identified deficiencies within the land delivery models in their contribution to social and physical infrastructure provision.

6.2 Summary

This study sought to establish how variations in urban land delivery models impact social and physical infrastructure provision. The study conclusively establishes that all informalities within land delivery models do not optimize the provision of infrastructure. The formal preplanned model is the only model that optimizes the provision of social and physical infrastructure on the condition that firm control and effective and faithful implementation is followed.

6.2.1 How Preplanned Land Delivery Model Optimize the Provision of Social and Physical Infrastructure.

Literature and findings from the survey show that the pre-planned model of urban land delivery optimizes infrastructure provision through a particular logic. Key to this model is the foresight development perspective conceived in a blueprint before actual implementation is done. The history of the development of Kitengela depicts both the formal unplanned (semi-formal) and an attempt in the formal preplanned models of urban land delivery. Were the preplanned model is slightly varied through implementation and development control, there is a relative attempt to provide basic physical and social infrastructure as revealed in the findings. The plan for the area indicates optimal provision. However, the lack of effective implementation and compromised development control in the implementation of the model has deviated from the ideal situation.

It is established that optimization of infrastructure occurs in the planning (scheme preparation) stage. When the urban area is being conceived formally, the population to be hosted in the area becomes the first key concern. Having considered the population, land use distribution and allocation are always optimized based on the population requirements and projections, which is optimization.

6.2.2 Land delivery Models' Contribution to the Provision of social and Physical Infrastructure.

Related to the summary in the section above, the various models' contribution to the provision of infrastructure is varied. Preplanned formal model effectively contributes to the provision of infrastructure. The study established that Noonkopir model only contribute 19% to the provision of public social and physical infrastructure. Kyangombe contributes 2% while chuna contributes 8% to the provision of public social and physical infrastructure. However, this study reveals various challenges that often make this model deficient in optimizing access to social and physical infrastructure. The first challenge is the implementation. All over the world, implementation through government entities often faces financial challenges. Due to limitations or lack of finances, infrastructural development often takes long to be implemented

or undeveloped. This phenomenon often exposes the land set aside for infrastructural development to irregular acquisition or reallocation under very unclear circumstances. As development continues to take place, the model slowly shifts towards the informal land delivery model. This study's view is that any deviation from the formal preplanned model of urban land delivery will always lead to a deficiency in the provision of social and physical infrastructure that is done in the interest of the public.

On the other hand, the informal model has various variations of sub-models, which also contribute variedly to infrastructure provision. Where cooperatives and SACCOs, or let's call them associations with common interests, are involved in delivering land for urban development, the provision of basic infrastructure is always optimized. First of all, the associations often convert a relatively larger chunk of land for urban development. In various instances, the associations with common interests often consult private experts to develop a scheme plan for the land where infrastructure provision in their members' interest is optimized.

Finally, the associations have their welfare as a collective concern and so their joint effort in raising finance for the implementation of infrastructure is always a common interest. There is always the effective implementation of the planning scheme with timely provision of infrastructure to serve the members. Such development often occurs smoothly with limited biasedness to provision of infrastructure since the concern and interest are not profit-motivated, but instead, the welfare of the members is the basic concern. The main limitation of this model concerning the public interest is that all the infrastructural services provided under this model are not available to the members of the public. They depict the characteristics of club goods.

Private companies and individuals converting agricultural land with the approval of the land Control Board and the County governments/local authorities as sub-models of urban land delivery (Formal unplanned model) present the highest deficiency in the level of infrastructure provision. In this case, the development model is highly incremental, with interest focused on the piece of land that is being developed. Within this sub-model, the motive is to maximize return on the piece of land. Therefore, public interest and welfare are never considered. In such areas, the only infrastructural services that exist are either privately owned and have been established to make profit or the government has provided to the public by acquiring land. These models often present the most expensive way of providing social and physical infrastructure. Consequently, the cost of living is often high with minimal championing of public interest. Pathological urban areas always emerge from this model (Hall, 1992; Baker 2002).

6.2.3 Residents Copying Mechanism

This study reveals that public interest can only be effectively safeguarded by the government. If the government fails to do so, the cost of living in the urban area is often unbearable. When government does not effectively provide basic social and physical infrastructure, a business opportunity emerges. This opportunity attracts the private sector, whose terms of service are dictated by the market forces. In this situation, the cost of accessing social and physical infrastructural services is quite high, but residents have to dig deep into their pockets to procure the services which are not subsidized.

As established from the findings on the service provides and the challenges associated with the provision of social and physical infrastructure in Kitengela, the residents have to bridge the

service gaps from the private sector. Consequently, the services are subject to exploitation and compromised quality. Alternatively, suppose they have to seek the available services to the public. In that case, they have to cover long distances to access the services. At the same time they are confronted with unreliability, inadequacy in quantities and congestion within public facilities. In the long run, the livability, and the quality of life in these urban places are questionable. The welfare and public interest are not a concern, but instead, the struggle is about survival.

6.3 Conclusion

In conclusion, it is clear that optimization of infrastructure provision only occurs at the planning stage within the urban land delivery pathway/model. This study proves that any land delivery model that deviates from the ideal model (that is, the formal preplanned land delivery model) does not optimize the provision of social and physical infrastructure as established in literature and justified in Kitengela. Noonkopir area had an attempt of preplanning but not all the players and the authorities were involved from the beginning to the end. Secondly, the objective of the plan was to allocate plots was guided by the independence Constitution (1963) and the Local Government Act, Cap 265. Kyangombe area totally deviates from the ideal model due to lack of the plan preparation that coordinates development of land uses and so the subdivisions are not guided by a broad planning framework. Chuna on the other hand does not deviate from the ideal but it is a private development which is exclusionary to the general public. These are the deviations that the various model in Kitengela pose from the ideal model of urban land delivery.

However, the variations that may occur in the land delivery models, the level of infrastructure provision will only depend on the proper planning, effective implementation guided by firm control. When individuals, companies, or private organizations deliver land for urban development, public interest (reflected in how social and physical infrastructure is provided) is always thrown out through the window; maximization of the return on investment is what takes center stage. Furthermore, within a scheme planning framework, land is allocated for social and physical infrastructure at optimal before the land is occupied by other development in housing/residential, commercial, or industrial development. Additionally, the preplanned model's effectiveness is seen in the emerging private development models of mixed-use developments of the so-called "private cities" across the globe and in Kenya.

The cost of infrastructure provision and access to the infrastructural services is often high in land delivery models that are informal/organic/laissez-fair. Coping in urban areas that have emerged from the models above compels the residents to endure high cost of infrastructural services, long distance, time wastage, lack of standards in quality and quantity of the services offered by the private sector service. On the other hand, the government has to incur high land acquisition costs when intervening to provide social and physical infrastructural services in urban areas that have emerged out of informal land delivery models.

Retrospective ways of providing social and physical infrastructure in urban areas that have emerged from informal land delivery models are geared towards redevelopment, reconstruction, and land acquisition, which are often expensive. These approaches are generally deconstructive planning, which is always confronted with rejection and loss of property. However, they are the only ways to restore welfare and public interest in already settled areas.

6.4 Recommendations

This study makes the recommendations in two folds. The first is on the opinion of the study regarding urban land delivery models and infrastructure provision. Secondly the recommendations on the perspective of retrospective provision of infrastructure. The logic of this position is that, since when land is being delivered, an urban area is being created. On the other hand, there are those urban areas that have emerged within an informal land delivery model and require interventions, which this study underscored as the opportunities for the retroactive provision of infrastructure. Therefore, the recommendations are made as follows.

6.4.1 Recommendations Relating to Land Delivery

i. Adopt the preparation of statutory medium to long-term land-use plans based on growth projections (coordinated planning to deliver land).

When a plan is prepared ahead of development, it will give a foresight on development matters that will entail infrastructural requirements within the areas projected to develop as urban as informed by the population. With such advancement, the state/government will fix infrastructural provision when land is being converted for urban development within the legal frameworks. Furthermore, the state will have the ability to control the densities in the areas that are envisioned to be developed into urban. This is a recommendation that will see private sector-led land delivery model of urban development.

ii. Adopt site and service schemes

There the advantage of employing site and service scheme as an incremental approach to delivering new land for expanding urban area. It was established from literature that site and service scheme was a way of improving access to quality and affordable housing. The approach was an incremental way of supplying more land for urban development in green field areas even if uncoordinated development plan was not in place. In such an instance, the servicing part of the approach ensured that basic infrastructure was already in place before people occupied the land. It is a better way of achieving formal urban sprawl that achieves optimal infrastructure provision.

iii. Adopt Urban Service Area (USAs) and Urban Growth Boundary (UGB) Concepts.

When an urban area has emerged formally or informally, there is always the inherent challenge of infrastructure provision within its periphery. The periphery always experiences rapid conversion into urban spaces in what has been recognized as urban sprawl (Gabrielson, Yorg, and Keith, 2009). Urban Service Area, as a principle, establishes the limit within which the authority responsible for service delivery in an urban area will provide infrastructural services. With this principle, growth directions where urbanization will be permitted with infrastructure already laid out will be achieved (Gabrielson, Yorg, & Keith, 2009). USAs perform the dual roles of making urban developments beyond service areas cost prohibitive and also ensuring coordinated development of infrastructure with other land use developments (Gabrielson, Yorg, & Keith, 2009).

UGB as a principle is a prohibitive approach. It designates boundaries beyond which development is prohibited. With this approach, the infrastructural deficiencies attributed to informal urban land delivery are minimized. However, this principle calls for proactive scheme

planning to keep pace with development. These principles are considered in addressing the impact of the informal and uncoordinated developments that result in deficiencies in infrastructure provision.

iv. Establish neighborhoods urban planning levels.

It was established in this study that, despite the land being delivered formally, or in a formal land delivery model, without effective implementation and firm control, there is the likelihood of the emergence of deficiencies in infrastructure. Institutionalizing neighborhood planning offers a wide variety of opportunities for successful implementation of infrastructural needs and firm control. First of all, when planning for urban areas and service provision is institutionalized at the neighborhood level, it draws from the Constitutional recommendation of further decentralization of services (Government of Kenya, 2010). A development committee at the neighborhood level will be conscious of the welfare and public interest of all neighborhoods. If constituted beforehand, it will be responsible for resource mobilization planning and implementation of plan proposals on infrastructure at optimum levels. This concept borrows from the efficacy of the cooperative/SACCOs land delivery sub-model established in Kitengela. If this recommendation has to be implemented, it requires the governments (Counties in this case) to consider the number of applications for conversion of agricultural land for urban development purposes and formulate a neighborhood committee from the members of the area. After which the committee, guided by the neighborhood planning standard, shall identify the infrastructural need for the area, allocate the infrastructure at optimum and surrender the land to National Land Commission for Processing of Titles where necessary and upon which the neighborhood plan is applications approved.

v. Address the land tenure issue on urban lands.

The lack of a common understanding and information that land is simply a bundle of rights has been responsible for informal land delivery models and deficiency in infrastructural provision. The land tenure system has made plan implementation and development control ineffective to an extent (Home, 2012). As established in theory, the concept of proper and formal urban development works properly in a feudal tenure system (leasehold). The complexities in urban infrastructure provision in informal urban land delivery models have been associated with customary land laws construed as a freehold tenure system in Kenya. With the freehold tenure system operation in urban areas, firm implementation of the covenants in a planning framework is impossible since the landowners are assured of their interest in the land to eternity.

If tenure issues are addressed by demystifying the concept of land as “a bundle of rights,” there will be the understanding that unpacks the complexities associated with the market forces.

6.4.2 Recommendations Related to the Retrospective Provision of Urban Infrastructure

The recommendations relating to the retroactive provision of infrastructure in urban areas that have suffered from pathogenic paths are as follows:

i. Use the approach of Shared burden and benefits

In both the preplanned models of urban development and the informal model of urban development, the shared burden and benefits approach offers an opportunity to provide social

and physical infrastructure. Suppose the government goes ahead to provide infrastructure through various models in public private partnership. In that case the burden will be shared with the individuals who will invest in the area through connection and user charges (Australian Development Study Network, 1998). Similarly, the government can capture windfall gains from the values of the land and property as a result of improvements in the provision of infrastructure, both physical and social. However, for public interest and welfare to be upheld, the infrastructural service provision has to be rested on the government. The private agencies that could be approached to support infrastructure provision can recoup their money then hand over the infrastructure to be owned by the public.

i. Adopt redevelopment and renewal approach (urban reconstruction).

The redevelopment and renewal approach offers the opportunity to optimize the provision of social and physical infrastructure in urban areas incrementally. When using this model, the government could use this opportunity to secure the future of public interest by acquiring land (that is, if privately owned) and redeveloping it according to the development needs and standards of infrastructure provision and reallocate on leasehold interests.

Replanning and reconstruction of planning an urban area or its parts provide an opportunity to make provisions of infrastructure and address the tenure system. It is an opportunity that gets legal backing from the police power of states. This approach allows the planning authority to pool land together for planning the land and redividing the land among the owners at their own cost. Simultaneously, allocation land for roads within the required standards and utilities that offer services to the area.

ii. Adopt newtown development approach with leasehold tenure system.

New town development is one sur way of ensuring that the urban infrastructure provision is optimized. Within this concept, there is the possibility of fixing the land tenure system, which is the main recipe for non-optimal provision of infrastructure since effective control cannot be achieved on a freehold tenure system. When the government fronts new town development to achieve public interest in urban areas, the cost of infrastructure will be relatively cheaper and there will be the autonomy in acquiring land for infrastructure if need be when the tenure is leasehold. Additionally, when the new towns are conceived, infrastructural needs are projected and availed based on the predetermined population to be domiciled in the urban area. Within this delivery framework, the densities and use are also predetermined leading to livable urban area that achieves public interest.

6.5 Suggestion for Further Research

While undertaking this study, some issues emerged that fell out of scope and this study could not get to interrogate them to arrive at a conclusion. Therefore, these areas are suggested for further research. The areas include:

- i. The effectiveness of land surrender in addressing urban infrastructural needs.
- ii. The efficacy of service provision under the current legal framework of establishing urban areas with the prevailing land tenure systems.

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APPENDICES

Appendix I- Key Informant Schedules

A. County DLPP& UD- County Planner

VARIATIONS IN LAND DELIVERY MODELS AND THEIR IMPLICATION ON THE PROVISION OF INFRASTRUCTURE: A CASE OF KITENGELA, KAJIADO COUNTY, KENYA

KEY INFORMANT GUIDE- COUNTY DEPARTMENT OF LANDS PLANNING AND URBAN DEVELOPMENT

DECLARATION: As a requirement of the University of Nairobi, students are required to conduct practical research studies to effectively understand and appreciate research process and to contribute in creating knowledge. The Information generated through this questionnaire will be held professionally and will only be used for academic purposes in informing the research on how variations on Urban land delivery models impact on provision of infrastructure in Kenya

1. How did Kitengela come to be?

.....
.....
.....
.....

2. How was the land availed for development of the town

.....
.....
.....

3. What procedures were followed from the delivery to the occupation?

.....
.....
.....
.....

4. What was the envisioned population for the town at conception?.....

5. Who were the planning authorities in the planning process?

.....
.....

6. What factors were considered when the urban areas were being established?

.....
.....

7. How was the infrastructure provided in the urban areas?.....

.....

8. Currently private individuals have been subdividing their land and converting them for urban land use. How are these development coordinated?

.....
.....
.....

9. How does the phenomenon impact on infrastructural service provision distribution and access?

.....
.....

What is the procedure of conversion of land from agricultural to urban land use?

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

10. What are the requirements that the developer must meet when converting the use for urban purposes?

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

11. How many education facilities were allocated land in the area?.....

12. How many health facilities were allocated land in the area?.....

13. How many recreational (playgrounds, open spaces) facilities were allocated to land?.....

14. How much land was set aside for:-

- a. Road development?.....
- b. Water infrastructure development?.....
- c. Solid and liquid waste management?.....
- d. Education facilities?.....
- e. Health facilities?.....
- f. Power supply infrastructure?.....
- g. What were the planned capacities infrastructure?.....

15. Are there, inadequacies?
.....

16. How are they being addressed?.....

B. Land Control Board in charge of Kitengela

VARIATIONS IN LAND DELIVERY MODELS AND THEIR IMPLICATION ON THE PROVISION OF INFRASTRUCTURE: A CASE OF KITENGELA, KAJIADO COUNTY, KENYA

KEY INFORMANT GUIDE- LAND CONTROL BOARD AND LAND ADJUDICATION OFFICER

DECLARATION: As a requirement of the University of Nairobi, students are required to conduct practical research studies to effectively understand and appreciate research process and to contribute in creating knowledge. The Information generated through this questionnaire will be held professionally and will only be used for academic purposes in informing the research on how variations on Urban land delivery models impact on provision of infrastructure with a case study in Kitengela Kajiado County Kenya.

1. How was the land availed and developed in urban area (procedures)?
.....
.....
2. What are the considerations for consent to be given on transactions on land by developers?
 - i.
 - ii.
 - iii.
 - iv.
3. In Kitengela, apart from the Public Land that has been leased for urban development there are other sections that have urbanized from transactions on agricultural land. Does the board provide conditions on the recommended development on such private lands?.....
.....
.....
4. How does the board ensure that there is a coordinated provision of infrastructure in these areas?
.....
.....
In your opinion, what are some of the challenges associated with controlling developments on the private lands visa a vis provision of social and physical infrastructure?.....
.....
.....
5. What can be done to ensure there is effective provision of infrastructure in land control areas?.....
.....

Appendix II – Land Owners/Developers Questionnaire

VARIATIONS IN LAND DELIVERY MODELS AND THEIR IMPLICATION ON THE PROVISION OF INFRASTRUCTURE: A CASE OF KITENGELA, KAJIADO COUNTY, KENYA

LAND OWNERS/DEVELOPERS QUESTIONNAIRE

DECLARATION: As a requirement of the University of Nairobi, students are required to conduct practical research studies to effectively understand and appreciate research process and to contribute in creating knowledge. The Information generated through this questionnaire will be held professionally and will only be used for academic purposes in informing the research on how variations on Urban land delivery models impact on provision of infrastructure with a case study in Kitengela Kajiado County Kenya.

1. What procedures do you follow when you wanted to develop/subdivide your land?
 - i.
 - ii.
 - iii.
 - iv.
 - v.
 - vi.
 - vii.
 - viii.
2. What are the conditions that you observe while developing/subdividing your land (e.g., amount of land not to be developed for other utility services)?
 - i.
 - ii.
 - iii.
 - iv.
 - v.
 - vi.
3. How do you ensure that services such as health sanitation, access security, safety, and recreation are within of your premises/property?

.....

.....
4. Which is the nearest:
 - a. School public school?Distance (Meters).....
 - b. Public Health Facility? Distance (Meters).....
 - c. Public Playground/Open /Recreational Space?Distance (Meters).....
 - d. Public West collection/Disposal site?Distance (Meters).....
 - e. Police station/post?Distance (Meters).....
 - f. Public water supply?Distance (Meters).....

Appendix III - Observation Checklist

VARIATIONS IN LAND DELIVERY MODELS AND THEIR IMPLICATION ON THE PROVISION OF INFRASTRUCTURE: A CASE OF KITENGELA, KAJIADO COUNTY, KENYA

OBSERVATION CHECKLIST

Neighborhood	Road Hierarchy (Widths)	Schools (No.)	Health facilities (No.)	Open spaces/play grounds (No)	Social Hall/ Community Centers	Public water Points (No)	Sewer System	Cemetery	Waste Collection/disposal facilities (No)	Police post/ Station	Fire breaks/lanes
Noonkopir		Preprimary									
		Primary									
		Secondary									
Kyangombe		Preprimary									
		Primary									
		Secondary									
Chuna		Preprimary									
		Primary									
		Secondary									

Appendix IV-Consent Form

**URBAN LAND DELIVERY SYSTEMS AND THE IMPLICATION
ON DEVELOPMENT CONTROL IN KENYA: A CASE OF KITENGELA
URBAN AREA
PARTICIPANT CONSENT FORM**

I -----,agree to participate in the research project titled *Urban Land Delivery Models and the Implication on Provision of Infrastructure in Kenya: A Case of Kitengela Urban Area* ,conducted by Nyaila Bonface who has discussed the research project with me.

I have received, read, and kept a copy of the information letter/plain language statement. I have had the opportunity to ask questions about this research and I have received satisfactory answers. I understand the general purposes, risks, and methods of this research.

I consent to participate in the research project and the following has been explained to me:

- The research may not be of direct benefit to me
- My participation is completely voluntary
- My right to withdraw from the study at any time without any implications to me
- The risks including any possible inconvenience, discomfort, or harm as a consequence of my participation in the research project
- The steps that have been taken to minimize any possible risks
- Public liability insurance arrangements
- What I am expected and required to do
- Whom I should contact for any complaints with the research or the conduct of the research
- I am able to request a copy of the research findings and reports

In addition, I consent to:

- photo taking or audio-visual recording of any part of or all research activities (if applicable)
- publication of results from this study on the condition that my identify will not be revealed.

Participant name: _____

Signature: _____

Date: _____

Researcher name: _____

Signature: _____

Date: _____

**Appendix V: Household
VARIATIONS IN LAND DELIVERY MODELS AND THEIR IMPLICATION ON THE PROVISION OF
INFRASTRUCTURE: A CASE OF KITENGELA, KAJIADO COUNTY, KENYA**

HOUSEHOLD QUESTIONNAIRE

DECLARATION: As a requirement of the University of Nairobi, students are required to conduct practical research studies to effectively understand and appreciate research process and to contribute in creating knowledge. The Information generated through this questionnaire will be held professionally and will only be used for academic purposes in informing the research on how variations on Urban land delivery models impact on provision of infrastructure with a case study in Kitengela Kajiado County Kenya.

SECTION A

1. Respondents Name

Gender	M	F	Age.	QN/ No.
--------	---	---	------	---------

2. Locality /Area/

SECTION B

1. Do you have access to the following services/ facilities? (yes/No)
 - g. Public school?Distance (Meters/Km/ Time taken).....
 - h. Public Health Facility? Distance (Meters/Km/ Time taken).....
 - i. Public Playground/Recreational Space?Distance (Meters/Km/ Time taken).....
 - j. Public Waste collection/Disposal site?Distance (Meters/Km/ Time taken)
 - k. Fire lanes and breaks?Distance (Meters/Km/ Time taken)
 - l. Police station/post?Distance (Meters/Km/ Time taken)
 - m. Public water supply?Distance (Meters/Km/ Time taken).....
 - n. Social Hall?Distance (Meters/Km/ Time taken).....
2. Who provides you with the following services? (1. private 2. public)
 - a. Education (School)?
 - b. Health?
 - c. Playground/Recreational Space?
 - d. Waste collection/Disposal?
 - e. Fire assembly or breaks?.....
 - f. Security?
 - g. Water supply?
 - h. Social Hall?
3. What are the challenges associated with the current state of provision of the following services currently?

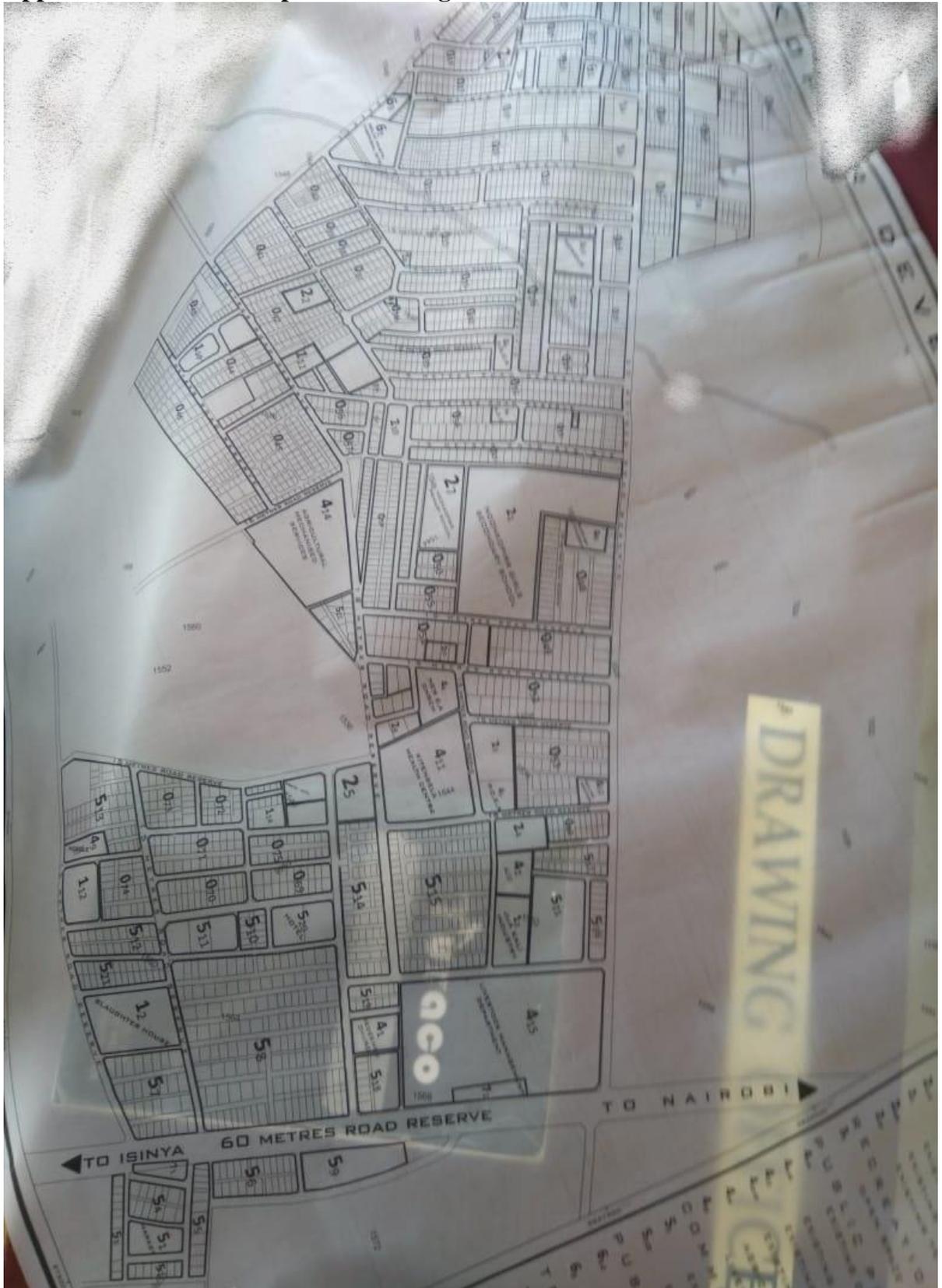
(i. Cost, ii. Distance, iii. Availability, iv. Adequacy, v. Quality of service)

 - a. Education (School) ?,
 - b. Health Facility?
 - c. Playground/Recreational Space?
 - d. Waste collection/Disposal site?
 - e. Security?
 - f. Fire and safety services?.....
 - g. Water supply?
 - h. Social Hall?
4. What is your opinion on the level of provision of basic public services based on the existing condition?.....

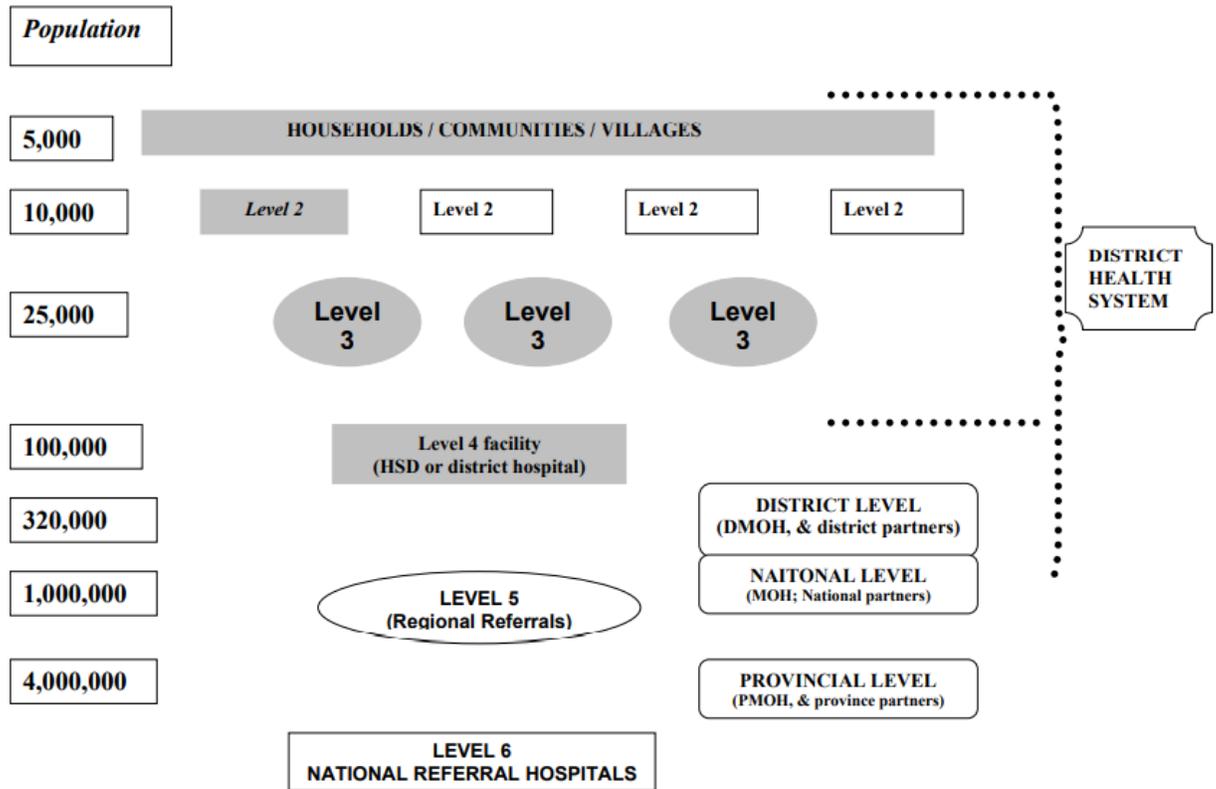
Appendix VI: Age of Respondents

Respondent's Age	Frequency	Percent	Valid Percent
18	1	0.8	1
22	2	1.5	1
23	3	2.3	2
24	2	1.5	2
25	3	2.3	2
26	3	2.3	2
27	7	5.4	5
28	2	1.5	1
29	6	4.6	5
30	4	3.1	3
31	6	4.6	5
32	8	6.2	6
33	5	3.8	4
34	3	2.3	2
35	4	3.1	3
36	6	4.6	5
37	1	0.8	1
38	3	2.3	2
39	1	0.8	1
40	3	2.3	2
41	5	3.8	4
42	5	3.8	4
43	7	5.4	5
44	2	1.5	1
45	4	3.1	3
46	5	3.8	4
47	2	1.5	1
49	1	0.8	1
50	2	1.5	1
51	3	2.3	2
52	1	0.8	1
53	3	2.3	2
57	1	0.8	1
59	3	2.3	2
60	2	1.5	2
67	1	0.8	1
69	1	0.8	1
70	2	1.5	1
72	4	3.1	3
76	3	2.3	3
79	1	0.8	1
Total	130	100	100

Appendix VII: The 1975 plan for Kitengela



Appendix VIII: Norms and Standards For Health Service Delivery



Source: Norms and Standards for Health Service Delivery, 2016 (Republic of Kenya, 2016).

Appendix IX: Research Permit



REPUBLIC OF KENYA



**NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION**

Ref No: **523682**

Date of Issue: **11/November/2020**

RESEARCH LICENSE



This is to Certify that Mr.. Nyaila Bonface Achieng' of University of Nairobi, has been licensed to conduct research in Kajiado on the topic: " VARIATIONS IN LAND DELIVERY MODELS AND THEIR IMPLICATION ON THE PROVISION OF URBAN SOCIAL AND PHYSICAL INFRASTRUCTURE: A CASE OF KITENGELA, KAJIADO COUNTY, KENYA" for the period ending : 11/November/2021.

License No: **BAHAMAS ABS/P/20/7663**

523682

Applicant Identification Number

Director General
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SCIENCE, TECHNOLOGY &
INNOVATION**

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Appendix X: Authorization Letter



University of Nairobi
Department of Urban and Regional Planning
School of the Built Environment
P.O. Box 30197, 00100 GPO Nairobi, Kenya
e-mail: durp@uonbi.ac.ke
Tel. 020 4913526

November 9, 2020

TO WHOM IT MAY CONCERN

RE: NYAILA BONFACE ACHIENG – B63/12885/2018

This is to confirm that the above named is a Master of Arts (Planning) student in the Department of Urban & Regional Planning, University of Nairobi.

As part of the continuous assessment culture in the Masters of Arts in Planning Programme our students are encouraged to acquire some experience through training in the field of Urban and Regional.

We wish to request you to allow him/her collect data from your institutions/households for his/her Masters Project title "***Variations in Land delivery models and their implication on the provision of Urban Social and Physical Infrastructure: A Case of Kitengela, Kajiado County, Kenya***".

Any assistance accorded to him/her will be highly appreciated.

A handwritten signature in blue ink, appearing to read 'Karanja Mwangi'.

PROF. KARANJA MWANGI, MKIP FKIP
CHAIRMAN
DEPARTMENT OF URBAN & REGIONAL PLANNING

