PUBLIC HOUSING WITHIN NAIROBI'S INNER CITY AREAS

A REVIEW OF HOUSING STRATEGIES FOR THE AFFORDABLE HOUSING ESTATE-PARK ROAD, NGARA

A RESEARCH THESIS SUBMITTED IN PARTIAL FULFILMENT FOR THE AWARD OF MASTER OF ARCHITECTURE DEGREE AT THE UNIVERSITY OF NAIROBI

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(B52/8454/2017)

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SCHOOL OF THE BUILT ENVIRONMENT

UNIVERSITY OF NAIROBI

2023

DECLARATION

This research project is my original work and has not been presented for award of a degree in any other university.

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ACKNOWLEDGEMENT

First and foremost, I am grateful to God for this far that He has brought me.

My deepest gratitude to my supervisors, Dr.Erastus Abonyo, Prof. Tom Anyamba and Dr. Edwin Oyaro (Post-humous). I will be eternally grateful for the time and effort that you put into this work.

I also thank the School of the Built Environment for providing a platform to pursue my studies. My appreciation goes to all lecturers in the Department of Architecture for their dedication to impacting knowledge to myself and many others as well as their unwavering support in the very challenging journey of pursuing architectural knowledge.

Last and most importantly, I express my sincere gratitude to my super family for believing in me and for giving me a reason to work hard and for their good thoughts and encouragement.

DEDICATION

To my dear departed sister, Doreen.

ABSTRACT

According to the United Nations, the world became over half urban around 2007, and is projected to be 66% urban by 2050 thereby making urbanization one of the most definitive trends of the twenty-first century. As a result, development of cities and urban areas has now taken the center stage in global development. Of critical importance is the development of adequate housing broadly defined as housing that is affordable, habitable, accessible, culturally appropriate and safe. It also focusses on bridging of the quantitative gap between the high demand resulting from rapid urbanization and low supply especially in less developed countries. The drivers of these shifts include international instruments to which many countries are signatories and include the New Urban Agenda whose focus is on the correlation between development and good urbanization as well as the 11th Sustainable Development Goal (SDG 11) that advocates for inclusive, safe, resilient and sustainable human settlements. As the need for adequate housing gets more pressing globally and with affordability challenges becoming increasingly dire by the day, governments, Kenya included, are getting involved in direct provision of housing, otherwise referred to as public housing. Shihembetsa(2005) notes that public housing, located within a radius of 6km of the CBD which falls within inner city areas, remains the cheapest in terms of rent hence its dominance over private housing. This explains the pressure that is felt in inner city areas where much of public housing which is deemed affordable is domiciled. The Government of Kenya has since 2017 given priority to affordable housing by listing it among the four priority agenda, further underpinning the GoK's commitment to ensure affordability of public housing. This initiative has been carried on by the new government regime. In the AHP, the GoK put in place strategies to ensure that housing developed would be adequate, and with the aim to facilitate ownership of homes for ownership by the lower income groups who would otherwise not be able to purchase houses in the open market. Key among the strategies was and remains GoK's commitment to provide public land and bulk infrastructure for development of public housing, with the delivery model being joint ventures and public-private partnerships with private entities. The pilot project for the AHP was the affordable housing estate in Ngara, whose strategies revolved around economic, social and environmental themes.

This study sought to establish the strategies deployed by GoK in the (re)development of housing within Nairobi's inner city areas and to examine their effectiveness in meeting the needs of housing within the said areas using the case of the affordable housing estate. The findings were then used to propose strategies that could bear the greatest benefit to all stakeholders involved in urban redevelopment within inner city areas.

The research revealed that the housing, though structured to primarily offer decent and affordable housing to Kenyans earning low income between KShs.0-150,000, it had been biased towards civil servants who majorly had access to mortgage facilities from the Ministry of housing-owned Kenya Mortgage Refinance Company, thereby transforming the project from being 'affordable housing' to 'mortgage housing'. This was evidenced by the fact that 65% of respondents were civil servants, and some of them were even outside the targeted economic group as they earned more than the prescribed KShs.150,000. The study also found that of the respondents, only a small percentage of current residents lived within Ngara before redevelopment, thereby alluding to possible gentrification as original inhabitants of the area may have been unable to afford to purchase or even rent the redeveloped houses. The study also established that ownership patterns of the houses may be indicative of potential population flight as there were no respondents of Indian descent despite Ngara historically being predominantly Asian at the time of its formation and therefore pointing to a lack of conservation of the historical and cultural morphology of Ngara estate. The study also found that despite the fact that traditionally inner city areas were occupied by the working class who benefitted from the proximity of their residences to their places of work-Industrial areas and CBDs-thus being able to walk to work, majority of the respondents indicated that they use motorized transport to get to their places of work as they are far, a trend that not only potentially exacerbates pollution in the city but also takes away from the advantage of the locational adequacy of inner city areas. Spatially, most residents considered the space averagely adequate in terms of size, typology variation, lighting and ventilation; and proposed that smaller units such as bedsitters ought to have been considered for use by students as they constitute a significant resident population in Ngara, due to its proximity to various tertiary institutions in the CBD. The study also observed a gap between the policy strategies and how they had been implemented in the AHE. It was also observed that materials used for construction of the houses did not give consideration to environmental sustainability and climate change concerns as they generally bear high embodied energy and the buildings are not designed for disassembly. The study therefore recommended that going forward, housing policies should be adhered to, as the affordable housing was noted to have had good strategies towards meeting socio-cultural, economic and environmental needs, which were not adequately implemented. Participation of stakeholders through public participation fora should also be observed as it was noted to be lacking despite it being a constitutional requirement for such projects. The study also recommended flexibility in housing in terms of typologies and pricing so as to allow people across diverse age groups to own the units. Finally, the study recommended use of the integrated urban transformation approach that combines conservation of what can be viably retained and redevelopment of irredeemable sections in dealing with housing challenges within inner city areas to mitigate against gentrification and population flight and ensure socio-cultural preservation.

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LIST OF ACRONYMS AND ABBREVIATIONS

GoK-Government of Kenya

AHP-Affordable Housing Programme

AHE-Affordable housing estate

NCCG-Nairobi City County Government

CSHSF-Civil Servants Housing Scheme Fund

KRSRBS-Kenya Railways Staff Retirement Benefits Scheme

SDHUD-State Department of Housing and Urban Design

NHC-National Housing Corporation

KNBS-Kenya National Bureau of Statistics

MTP-Medium Term Plan

NAWASCO-Nairobi Water and Sewerage Company

NMT-Non-Motorized Transport

NURP-Nairobi Urban Renewal Program

PPP-Public Private Partnership

JV-Joint Venture

COTU(K)-Central Organization of Trade Unions(Kenya)

CHAPTER ONE: INTRODUCTION

1.1 Introduction

Urbanization is one of the most transformative trends of the twenty-first century with more than 50% of the total global population expected to be living in urban areas by 2050. Studies have attributed rapid urbanization to natural population increase and rural-urban migration in the global south, and information revolution in the global north. As a result, many cities and urban areas of the world today face major and widespread housing crises alongside social inequality, environmental degradation and climate change. The housing crisis has been exacerbated by natural disasters in some parts of the world, such as in the case of the recent (2023) earthquake in Turkey that led to the displacement of millions of people, compounding to an existing housing crisis and leading to rent increases of about 45% for the little available housing stock.

Governments are constantly facing demands to provide better and proper housing (Gilbert, 2000) amid massive challenges in terms of infrastructure, basic services such as security, health and education, employment opportunities, natural disasters, among others. UN Habitat further approximates that close to 3 billion people will need access to adequate housing by 2030, and guides that to meet that demand, there is need to build approximately 96,000 new affordable homes every day globally (UN Habitat, 2019). The case is especially dire in the global south which includes countries in Africa, Asia and Latin America, which are expected to face a sharper increase in housing demand compared to the developed world.

Africa in particular is in a historic period of demographic change with majority of the countries across the continent experiencing exponential population growth courtesy of rising birth rates and rural-urban migration. As a result, Africa is in the midst of a massive quantitative and qualitative housing crisis. Demand by far outweighs supply and affordability of the available housing becoming a key issue by the day(Cytton,2018). Ehresmann (2008) avers that the housing crisis in the global south has been worsened by the fact that countries therein are experiencing rapid urbanization but with incommensurable industrialization. He also points to the failure of many governments to effectively handle the phenomenon of mass rural to urban migration as being a major contributor to the housing crisis and further avers that these factors are causing growth of informal settlement populations and deteriorating living conditions that translate into mass human rights violations.

In many major cities within the continent, the impact of the rural-urban migration is felt severely in inner city areas due to their proximity to the CBD and the industrial area where these immigrants will be seeking to get employment and also in informal settlements due to the affordability of housing therein(Shihmbetsa,1995). Another key challenge to housing within the continent is that urban governance capacities remain severely lagging with poor social and economic policies, poor urban planning and poor housing approaches and strategies being among the most significant hindrances to the growth and development of physical and socio-economic infrastructure, housing included (KPDA,2018).

The above challenges in housing call for extensive and intensive urban transformation strategies and processes that will bear immediate and sustainable outcomes. One of the widely utilized approaches to transformation of urban areas, particularly of inner city areas in modern history has been urban redevelopment. This involves demolition and reconstruction of existing buildings or infrastructure within urban areas. The approach has its roots in the late 19th century in developed nations where it was often used to address urban decay in cities and to achieve better land utilization in the dilapidated urban areas. It involved clearing out of blighted areas in inner cities to create opportunities for better housing, transformation of neighborhoods from low-density developments (single-family housing) to higher-density developments (mixed-use or commercial), businesses, and other developments through zoning, planning, and land use changes geared at achieving maximum density and building requirements. The process has been found to be impactful on the physical, social-cultural, economic and environmental aspects of many urban landscapes and it has played an important role in the history of cities around the world. Syagga et.al (2002) argue that most urban redevelopment projects have proved to be unsustainable socially, economically, physically and environmentally due to lack of adequate planning, involvement of the intended projects' beneficiaries, and poorly thought out policies. One such example is the densification of inner city neighborhoods without proper plans for increased populations and associated increased operational costs for houses (Syagga et.al,2002). Syagga further asserts that the challenge is to redevelop settlements in a way that lends to physical, social, environmental and economic sustainability at appropriate standards and in a participatory fashion.

Given that the government owns substantial land within inner city areas, the impact of development and re-development of housing projects is bound to be felt at a large scale and has the potential to create huge impacts within inner city areas. Makachia (2011) observes that in her century of existence, Nairobi has served as a laboratory of various housing strategies and especially those targeting indigenous Africans and the poor. Inner city areas, slums and informal settlements have been a breeding ground for many of these strategies and many of them under the umbrella of

partial and/or comprehensive redevelopment. In the case of Ngara, different government agencies have deployed different strategies and models in their execution of urban redevelopment housing projects. These include projects owned by the national government (the Affordable Housing Project), those owned by the county government (Old and new Ngara) and those owned by state-owned agencies such as Kenya Railways and the Civil Servants Housing Scheme Fund. This study seeks to review the different strategies deployed by the government in housing (re)development, specifically in the case of the affordable housing estate. It will further seek to establish the effectiveness of these strategies in meeting the ultimate goals of housing as set out in the Kenyan constitution and other guidelines to adequate and sustainable housing and finally to propose strategies that can be adopted for similar such projects.

1.2 Background

The subject of housing is currently a topical issue in Kenya, with affordable housing being listed as one of the four key ambitious social programs that the GOK(2017-2022) committed to undertake alongside universal health coverages, enhancing manufacturing and food security. For housing, the focus was to resolve the systemic quantitative shortages of adequate housing that the Ministry of Housing has put at 200,000 units annually. It has indicated that the rate of supply of new housing is 50,000 units per year and of which only 1,000 units target the low and lower middle incomes. The bulk of the new housing, 49,000 units, target upper and higher middle income groups. This has led to a cumulative shortage of 2,000,000 units so far (Ministry of Housing,2019). One of the notable efforts by GoK in the recent past is that of the affordable housing program(AHP) that targeted to facilitate construction of 500,000 new housing between 2017-2022 together with supporting infrastructure. Key strategies adopted were geared towards enhancement of the quantitative output of affordable housing for low income groups through cost-effective construction mechanisms, job creation, home ownership and increased GDP contribution from the construction sector. By the expiry timeline of the project in 2022, only 2,235 housing units had been constructed against the targeted 500,000 units.

Today the focus on affordable housing has been intensified by GoK(2022-2027) with both the national government and county governments getting directly involved through partnerships with private developers through Private-Public Partnership(PPP) and joint venture(JV) agreements. GoK has committed about 3,000 acres of Nairobi's public land to the affordable housing programme (The Star,5th October,2022) which targets construction of about 250,000 units countrywide. As a matter of fact, an article published by the Business Daily on January 20, 2023, 39 out of 47 counties in Kenya have provided land or signed an MoU with the National Government for public housing projects to be rolled out within their

jurisdictions across the country. At the center of this is land within inner city areas, hence the focus on housing therein. A number of projects planned to take off under the AHP within inner city areas include mass housing developments in Pangani, Shauri Moyo, Ngara, and Starehe. To meet present and future demands of housing their populations, urban housing in cities has often grown in two directions; outward towards the open country through urban sprawl, which Gray (1946) attributes to centrifugal/decentralizing urban forces and inwards towards the CBD, which Gray (1946) attributes to centripetal/ centralizing forces. It is the growth towards the CBD that gives life to the critical importance of inner city areas in the sustainability of cities. Key characteristics of inner city areas is their proximity to the CBD, their ability to be easily accessible from the two major employment centers i.e. the CBD and the industrial area, their predominant occupation by working class populations and their potential for the urban poor in terms of the opportunities to earn them a living (Shihembetsa, 1995). Public rental housing forms a large percentage of inner city areas of urban centers in many countries of Sub-Saharan Africa and among the most affordable housing available in terms of rent as noted by Shihembetsa(1995). Interesting concepts that emerge therefore are affordability, accessibility and locational adequacy of inner city areas.

All the projects currently in the pipeline within inner city areas involve urban redevelopment as the key approach, and involve intense densification of residential plots. Although Koebel (1996) points out that the city is a dynamic system of building, expansion, contraction, maintenance, decline, repair, demolition, and rebuilding, Watson (2014) observes that the approaches geared towards urban transformation and housing in many cities of developing countries through urban master plans formulated by their national governments do not resonate with the reality on the ground in the said cities. Governments therefore have the responsibility of creating conducive environments with clear policy guidelines for both public and private developers of housing and other supporting, physical and social infrastructure. This study will endeavor to establish whether the strategies deployed in the development of the first project under the AHP, i.e the affordable housing estate at Park Road,Ngara, are effective in addressing the needs of housing.

1.3 Problem statement

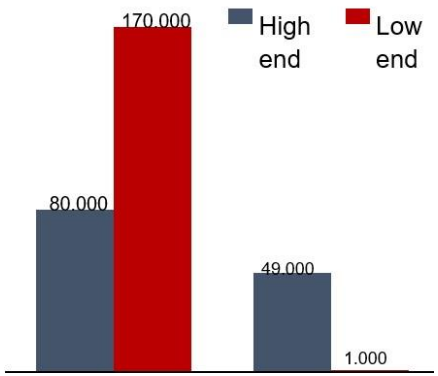


Fig 1.1:Source:SDHUD

As cities world over become increasingly and unbearably overcrowded, the availability of adequate housing both in terms of quality and quantity is getting more urgent everyday world over (Brasoudehoux, 1994). In the case of Kenya, annual housing demand stands at 250,000 annually, with annual supply estimated at 50,000. Of this, only 1,000(2%) of formally constructed houses target the low end income group. There is therefore need to focus on housing that is accessible to lower income groups, particularly in inner city areas such as Ngara, as they continue to be among the preferred points of first destination for people migrating into the city, students due to their proximity to the CBD as well as the working class (Khaoya,2008). To bridge the cumulative deficit of two million units, the government has deployed a raft of strategies that aim to not only meet the quantitative demand but also the qualitative needs of housing as prescribed by various international and local regulations. There have been efforts by both public and private stakeholders in Kenya to deal with historical challenges associated with inner city areas globally such as urban decay, dilapidated housing, high crime rates, overcrowding interspersed with low density bungalow developments and unemployment through urban renewal and redevelopment initiatives by county governments as well as housing projects being undertaken by the national government under the Affordable Housing Initiative.

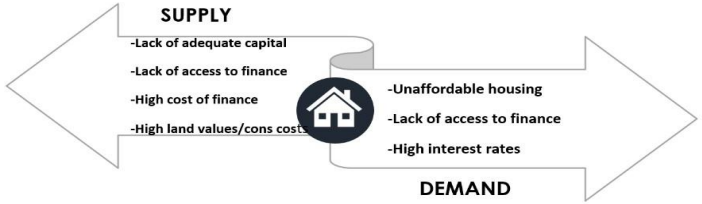


Fig 1.2:Source:SDHUD

Despite the raft of strategies that have been put in place in areas such as in inner city areas such as Pangani, Shauri Moyo and Ngara; economic, socio-cultural, physical and environmental challenges still abound, affecting the general efficacy of housing solutions provided. Wachira (2014) notes that in Kenya's housing scene, years of policy advice and pledges have not produced the envisioned outcome, thereby suggesting that something very fundamental is lacking in the country: visionary, democratic and dedicated leadership. This has been evidenced by the failure of the government to meet its primary target of 500,000 houses, and instead only yielded 2,235(0.45%). This failure of strategies deployed by the government to increase the housing stock in inner city areas such as Pangani, Shauri Moyo and Ngara was attributed to economic and legal challenges.

Economically, affordability both on demand and supply sides remains a major impediment on successful implementation of GoK's housing strategies and on their impact to meet housing needs. Lack of funding in the form of lack of capital, high cost and limited access to finance, high costs of land and have been a hindrance to housing both on the supply and demand sides. On the supply side, lack of availability of adequate funding has been placed at the core of quantitative challenges, effectively considered as the shortfall of housing units vis-à-vis the demand, and has been cited as a key challenge to keeping up with targeted delivery of housing, and has been cited as a key contributor to the failure to deliver even 1% of what was targeted under the 2017-2022 affordable housing program. The scale of redevelopment of housing as envisaged by the government is capital intensive (Cytton,2020). Legal hurdles pertaining to implementation of financing bills as experienced in 2019 and 2023 have had massive effects on the development of housing, thus further staying the quantitative challenges. High costs of development of housing translate to high costs of housing rent and selling prices, often making them unaffordable to many. On the demand side, lack of funding has been a major hindrance to many potential home owners. The residents are usually adversely affected economically, socially and psychologically as they will be required to pay high rents or mortgage repayments for redeveloped housing units.

Those who do not afford the redeveloped housing units are forced to relocate permanently, leading to gentrified inner city areas. Inner city areas have since time immemorial played host to relatively low income earners working in historically high employment zones i.e the CBD and the industrial area. The focus of government to substantially house civil servants in inner city areas as noted in the case of the Civil Servants estate along Desai Road, Ngara and with the Civil Servants Housing Scheme Fund taking up 40% of housing units in the AH estate,Park Road. This upsets the socio-economic and cultural set-up of inner city areas particularly that of Ngara, which presented an interesting mix of people from across diverse demographic groups such as students, fresh graduates starting out at life, small business owners, and family set-ups.

Socially, Khaoya (2008) notes that there is a challenge of moving residents of redevelopment sites within inner city areas, some of who may have stayed there for a very long time. This has resulted in resistance to move. Case in point, residents who were to be displaced in Pangani, Old Ngara and New Ngara lodged legal suits against the proposed projects thereby causing delayed project execution. These legal suits were attributed to lack of adequate public participation leading to mistrust of the process. Residents feared that their security of tenure was not guaranteed. These issues underline the importance of public participation in public housing projects within inner city areas.

One of the strategies adopted by both public and private developers in dealing with the housing crisis in inner city areas in the recent past has been that of rezoning the areas to accommodate higher density developments usually in the form of high-rise residential and commercial projects. Local governments have facilitated this by increasing plot ratios and plot coverages. This has resulted in widespread urban redevelopment projects within inner city areas, involving bringing down of existing low density developments and replacing them with multi-storey, densified new developments. For instance, the affordable housing estate at Park Road that hosts 1,370 units previously hosted 48 units. Such drastic physical changes have social and environmental implications. Preliminary indications of challenges associated with densified, high rise developments made in other neighbourhoods such as Kileleshwa where similar strategies have been applied include overcrowding, gentrification, solid and liquid waste management challenges, shortage of services such as water, air pollution, constrained infrastructure as backlogs of street and transport upgrading remain unresolved, high service charges and maintenance fees, diminishing open spaces, overstretched access facilities such as streets, cycling paths and walkways, pollution and environmental degradation (Kiai,2013). For Ngara, such challenges would be a potential cause for population flight, especially of residents of Asian descent therefore upsetting the cultural makeup. This study will seek to establish whether these challenges hold true in the case of the affordable housing estate at Park Road, Ngara.

1.4 Research Objectives

1.4.1 General Objectives

To assess the effectiveness of the strategies deployed by the government in the provision of public housing using the case of the affordable housing estate at Park Road, Ngara.

1.4.2 Specific Objectives

a) To assess strategies that have been deployed by the government in the (re)development of housing within Nairobi's inner city areas.

b) To examine the effectiveness of the strategies applied by the government in housing projects within inner city areas using the case of the affordable housing estate, Park Road.

c) To propose strategies that could bear the greatest benefit to all stakeholders involved in urban redevelopment within inner city areas.

1.5 Research Questions

a) What strategies have been deployed by the government in the (re)development of housing within inner city areas?

b) How effective are the strategies deployed by the government in meeting the needs of housing in inner city areas, such as the affordable housing estate at Park Road Ngara?

c) What strategies can be adopted for public housing projects going forward?

1.6 Justification of the study

Housing is a topical issue today not just in Kenya, but globally. In line with article 21 (2) of the Kenyan constitution (2010) which obligates the government to take legislative, policy and other measures, including the setting of standards, to achieve the progressive realization of the rights guaranteed under article 43, the Government of Kenya (2013-2022) defined the "Big Four" transformation agenda for the nation which identified four priority areas be implemented between 2017-2022, key among them being the delivery of 500,000 affordable housing units in major urban areas across the country. Many county governments are also in the process of putting up housing projects within their jurisdictions, hence presenting an opportunity to fill in knowledge gaps and plough back lessons from the existing public housing projects, in line with growing academic interest in this line.

The focus of the study is Ngara's affordable housing estate along Park Road firstly because it is the first project to be completed under the affordable housing program. Also, Ngara presents an interesting socio-economic mix of its residents; ranging from university and college students living in hostels to well established middle class families occupying 3-bedroom units within the estate, hence it is apt to study how the government-led housing initiative have impacted on the rich genetic make-up of Ngara.

Land owners such as public institutions will benefit from the understanding of appropriate and efficient strategies for public housing and how to address the possible challenges that are likely to be encountered in the process. The NCCG which happens to own potential sites earmarked for public housing projects in Shauri Moyo, Mbotela and Makadara will gain from the thorough understanding of the public housing process that will guide them in having effective projects.

1.7 Study Assumption

In order to realize the above objectives, the study makes the assumption that the findings that will be deduced for the case of the affordable housing estate, Ngara are likely to be applicable to public housing projects in any other of Nairobi's inner city areas.

1.8 Scope of the study

This study particularly considers public housing developed by the government of Kenya under the umbrella of afforadable housing, and hopes to establish its efficacy thus. The research will be done in Nairobi city, Kenya. The specific location of the study area is the affordable housing estate along Park Road, Ngara.

CHAPTER II: LITERATURE REVIEW

2.0 Introduction

This chapter reviews existing literature on housing within inner city areas, particularly that which is developed by the government. The aim of this chapter is to conglomerate current theoretical knowledge on strategies deployed in development and redevelopment of housing in inner city areas and the resultant outcomes and impacts both on the supply and user ends. The chapter will review relevant topics from a global perspective down to the case of Nairobi, all with the aim to give clarity to the objectives of this study. The topics to be reviewed will include urban transformation approaches and strategies, housing, elements that constitute adequate housing against which effectiveness of strategies deployed by the government can be tested, and a case study of a public housing project that has largely been successful and worthy emulating.

2.1 Housing

Fig 2.1 Marslow's hierarchy of needs. Source:Psychological Review(1943)

Of all of human needs, food, shelter and clothing have been rated the most basic. Of these, our primary concern as professionals in the built environment is shelter, whose key component is housing. Nabutolah,W.(2004) observes that just like food, shelter is a basic physiological human need; so much so that even those who cannot afford it still need it. Housing is regarded as a man-made habitation for human beings and is made up of shelter and the supporting basic infrastructure required by man. It is at the core of the relationship between people, their physical and psychosocial environments. It is also a crucial determinant of healthy living and it is key to sustainable urbanization (Winston and Pareja East-away, 2008). The sustainability of cities largely depends on how mass housing needs are met (Balla et al.,2017). Housing broadly goes beyond provision of an enclosed space with a roof above the head because it provides the foundation for people to live in as they go about physical and social actions (Byrne and Diamond, 2007). Rapoport (1969) observes that development of housing is an outcome of several economic, environmental and socio-cultural variables, rather than just physical forces or a single causative cause. Housing development is therefore more than just than buildings and dignity of shelter as it includes provision of decent infrastructure, considerations of communal life through creation of inclusive urban environments as well as decent and supportive social and cultural milieu (Sustainable housing

for sustainable cities,2019). Overall, housing is a collection of physical, environmental, economic and socio-cultural systems which come together to form the housing system (Francescato et al., 1987). Economically; housing as an investment contributes towards wealth generation, creation of employment, improvement of health and increased productivity of the labor force. It also serves as an asset that contributes to the owner's portfolio and as a store of wealth(Alhashin and Dwyer, 2004).

Socially benefits include protection from elements of weather, social infrastructure provisions such as hospitals and schools, as well as sanitation facilities (Chirchir, 2006). Culturally, well designed and sustainable housing enables users to have a sense of identity through physical or non-physical features that relate to a people's way of life, provides privacy, safety and security.

Environmentally, seeing that housing is an unavoidable component of the environment, well designed sustainable housing is vital in ensuring a healthy mix of the built environment and the green areas as well as averting agents of climate change and global warming such as carbon emissions and greenhouse gas emissions.

2.2 Public Housing

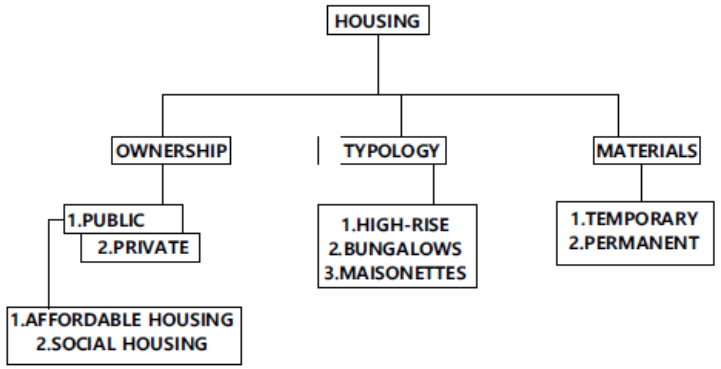


Fig 2.2:Types of housing Source: Author

Housing is classified depending on the type of materials used, typology and ownership. Of relevance to this study is public housing whose origins lie in the surge of urban population occasioned by the industrial revolution of the 19th century. The housing situation in urban areas deteriorated so much and was characterized by unrealistically small house spaces and without proper foundations, lack of drainage and sewerage, sharing of residential spaces with animals such as pigs and cows as well as slaughter houses in back yards. A number of philanthropists opted to provide housing within tenement blocks while some of the owners of factories built entire villages for their workers.

Following a report from the Royal Commission in England in 1885 in which the plight of housing for the poor was highlighted, the state formulated the Housing of the Working Classes Act of 1885, which empowered Local

Government Boards to shut down unhealthy properties and encouraged them to improve the housing in their areas. Government stepped in to set standards that sought to ensure high-quality homes and henceforth became involved in housing directly and indirectly.

Today, every citizen is entitled to adequate housing as spelt out in various instruments including the Kenyan constitution. However, no government is obliged to construct the entire housing stock for a nation (UN, Fact Sheet No.21). The government plays an indirect role in all housing within its jurisdictions through policy setting of standards such as in the building code, zoning development, regulation, provision of services and security, among others (UN Habitat,2008). Directly, governments world over play a critical role in provision of affordable housing as well as social housing, in a bid to protect the interests of its vulnerable groups such as the poor and the aged. The UN further guides that governments should safeguard the right to adequate housing by putting in place measures that are needed to prevent homelessness, prohibit forced evictions, address discrimination, focus on the most vulnerable and marginalized groups, ensure security of tenure to all, and guarantee that everyone's housing is adequate. In the case of public housing, governments at local or national level directly own the housing with the ultimate goal of providing decent and affordable housing.

2.3 Adequate Housing

So critical is the need for proper housing that the right to housing is embedded in various international instruments including the United Nations Human Rights Declaration of 1948, the International Covenant on Economic, Social and Cultural Rights of 1966, the Istanbul Declaration and Habitat Agenda of 1996 and the Declaration on Cities and other Human Settlements of 2001(Republic of Kenya, 2004). In Kenya, the right to adequate housing has since 2010 been entrenched as a justiciable right in the Constitution under **Article 43 (1) (b).** The article provides that 'every person has the right to accessible and adequate housing and reasonable standards of sanitation'. Article 43 (1)(b) read with Articles 20(5) and Article 21(1),(2) and (3) of the Constitution of Kenya 2010 provides for fundamental rights to housing. In 1972, Kenya ratified Article 2 of the International Covenant on Economic, Social and Cultural rights (ICESR) making it part of the Kenyan law and this enabled Kenya to adopt the right to housing in international law as recognized under Article 11 of the 1966 ICESR. This provides for the right of everyone to an adequate standard of living and outlines the key indicators to adequate housing. The seven elements of the right to housing and which are indicators of adequate housing are outlined in General Comment 4 of the ICESCR and they are as follows:

i)Security of tenure: -Refers to the assurance of legal protection against threats such as forced eviction and harassment and often sealed with issuance of ownership documents such as share certificates and title deeds. The government's strategy for this is promotion of home ownership through enhanced access for the lower income groups who would otherwise not access homes and issuance of sectional titles for housing units as facilitated by the Sectional Properties Act, 2020.

ii)Access to services and infrastructure:-Includes access to physical and social infrastructure eg schools, hospitals, roads, sewer, water, power etc.

iii)Affordability: -Ability to be able to pay for housing while not compromising ability to meet other needs. Usually capped at cost of housing not exceeding 30% of a household's income.

iv) Habitability: - Ability to meet the needs of human comfort, health and safety. Includes parameters such as size of house *vis-a-vis* number of inhabitants, adequacy of lighting and ventilation, availability of requisite services etc.

v)Physical accessibility: -Gives consideration to accessibility of spaces to people across different age and ability spectra through inclusion of facilities such as ramps, lifts, play areas, pedestrian and cyclist paths etc.

vi)Location adequacy: - Reasonable proximity to work, live and play areas is considered, as it gives opportunity to wholesome living.

vii)Cultural adequacy: - Refers to consideration of cultural identity and due expression through elements that the beneficiary communities can identify with even in their diversity. Of particular importance in redevelopment of housing is consideration to harmonic integration between the new and the existing so as not to lose a place's identity.

Adequate housing should achieve a balanced mix of all these seven elements. These elements form the interface between urban design professionals and those in other sectors such as in the social and economic professions. This study will use them as parameters to measure the adequacy of the affordable housing projects in Kenya today. The Journal of African and Asian Studies 2008 notes that realization of a balanced

combination of all these elements in the face of the intense commercialization of basic necessities witnessed within human settlements as is in the case in Nairobi is almost impossible.

2.3 Factors That Influence Housing

Qualitative and quantitative aspects of housing are influenced by economic, environmental and socio-cultural issues (*Tiesdell and Carmona,2007).* They further observed that these factors not only influence the outcome of housing and urban environments but they also present challenges and opportunities which require proper and innovative planning in order to yield desirable urban environments and housing. The following sections outline in detail factors that influence housing under social-cultural, economic and environmental realms.

2.3.1 Economic Factors

Economic factors affect housing on both supply and demand ends. On the supply side, economic factors involve a myriad of determinants including cost of construction, accessibility of finance and governance issues such as legislations and policies. On the demand side, economic determinants include income levels, affordability, access to finance and interest rates. The following sub-sections look into each of these factors and how they affect housing;

2.3.1.1 Supply side of housing:

The main shaper of supply in the housing market is the ability of developers to construct housing units as dictated by the prevailing demand. A number of economic and financial factors bear great influence to this ability. These include:

a) Cost of construction:

Anderson (2022) notes that the main factor driving the cost of housing is the cost of construction. The cost of construction is often made up of the cost of materials, construction labor costs, statutory fees and professional fees. Several researches in the building sector globally have identified building materials as the largest single input in housing construction, taking up 50%-60% of the total cost of construction. There is therefore an urgent need to address the cost of building materials as their high costs generally have potential to slow down the growth of the housing sector (Arayela,2005). Similarly, Wagura (2013), postulates that prohibitive construction costs are a major contributor of inadequate housing supply in Kenya and argues that for the cost of housing particularly in cities to go down, there needs to be use of innovative, alternative building technologies and materials. He further points out that another key area that significantly adds to the burden of high cost of construction is that of

costs payable to regulatory agencies in Kenya and include approval fees to counties, fees payable to NEMA, cess taxes charged on materials. Costs of materials has been on an upward trend, leading to progressive increases in cost of construction.

b)Cost of land

Land is the main component of the built environment, as all built structures depend on it for anchorage(Windapo,2020). In the pre-colonial times as in case of Kenya and other countries with colonial heritages, customary law alienated the sale and interest in land. With the coming of the money economy however, came the land holding system where various interests and rights in land were introduced and land ownership became an economic venture. The cost of land has been on an all-time upward trend with land in CBDs and inner city areas being the highest in value. This cost impacts the overall cost of projects and particularly makes housing costly. Value of land is particularly high in Nairobi has been a major challenge to development of housing (Cytton 2020).

The situation for inner city housing is made worse by the fact that land in inner city areas is typically high value due to the proximity to the CBD (Shihembetsa, 1995). When left to market forces the resultant rental and sale prices become equally high and out of reach for many. As a matter of fact, Nairobi has been rated the most expensive in terms of cost of land in Africa (Knight Frank, 2019) as well the most expensive city to build in Africa after Johannesburg in South Africa, and 86th globally according to a report by Arcadis Design and Consultancy (2019). A report by Knight Frank (2021) dubbed *Africa Logistics & Industrial Review* indicated that Nairobi has since 2018 recorded a steady increase in rent for its residential and commercial spaces. It ranked Nairobi as the city with the highest residential housing rental rates in Africa while placing its demand for housing at 80%.

c)Interest rates

According to Phang (2010) interest rates impact on both demand and supply of housing. They impact the ability of buyers/tenants to be able to purchase or rent property, and impact on the ability of developers, government included, to supply housing units. Owiro(2011) observes that interest rates have an inverse relationship with demand of housing in that when they are high, the demand of properties is low and vice versa.

d)Access to finance

Ability to access finance affects both the demand and supply of housing. Inability to access adequate finance for developers leads to serious constraints on the supply of houses. When developers depend on credit which is expensive due to high interest rates, the effect is felt on the cost of construction and eventually on the cost of the houses. Even at government levels, lack of access to adequate finance inhibits their ability to provide adequate infrastructure and services, thus affecting the ability to achieve adequate housing (Kongoro,2015).

e)Technological factors

The impact of technology has in the last decade been felt in the housing sector as it is gradually redefined by ever-changing market conditions and shifts in consumer behaviors(Cytton,2023). Innovative solutions that that have included software solutions, applications and platforms stellar solution in the Kenyan housing scene being the Boma Yangu housing initiative online platform.

The last decade has also seen shifts in building technology, through adoption of alternative technologies. In Kenya for instance, the emergence of EPS panels by NHC have been a game changer as they have been found to cut project cost by 30%(NHC,2022). This technology involves assembling of expanded polystyrene (EPS)panels sandwiched between a steel wire mesh that is plastered on both sides with concrete(NHC,2012). A standard two-bedroom house measuring about 100 square meters requires about 70 panels each weighing 15 kilos – meaning a house can be carried in a single lorry load as compared to a conventional masonry house that will involve a lot more material(NHC,2012).

The use of stabilized soil blocks has also been encouraged by Kenya's Ministry of Housing and the market has been receptive even as property developers are adopting alternative building technologies in a bid to tackle rising construction costs without compromising on the quality of structures(MoH,2020). The government has availed SBSS machines at their offices in all counties. s As the industry evolves on matters technology, concepts such as smart homes and use of renewable energy are emerging, and are becoming the competitive edge in the housing market. (Cytton, 2015).

f)Governance Issues

Globally, government policies, regulations and legislation have a major impact on both quantitative and qualitative aspects of the housing market. Comparative studies on housing policies and strategies globally have shown that policies in favor of market mechanisms have failed to solve housing problems for the poor masses (UN Habitat,2008).

Governments have since time immemorial had a stake in housing within their jurisdictions. Countries in the developed world have particularly had comparatively better planning, land use and zoning policies, and have thus been able to resolve their housing challenges to a considerable degree. On the other hand, countries in the developing world particularly in parts of Asia, latin America and Africa have not had policies that have effectively resolved their housing crises, hence challenges in housing still abound within many of the countries therein (Mutali,2016).

Policies can also impact on the function of space. For instance, the stay-at-home policies that governments imposed during the covid-19 pandemic transformed housing into not just living spaces as we knew them, but also as multi-functional spaces for work and play.

Beyond policy making, there is a need for goodwill to implement the said policies. In the case of Kenya for instance, previous policies and projects have not been successfully implemented. One example of a government-led housing project whose implementation did not align to the goal and vision of the project was the slum upgrading program, which beside not meeting the targeted group, was not fully implemented. The affordable housing project (2017-2022) has also so far not met its goals, quantitatively, as discussed in then problem statement section of this report.

Government is also responsible for creating an environment where both supply and demand for housing thrive at an equilibrium (Wairimu W.,2018). She postulates that this can come in the form of working with the private sector to attract financing through financing instruments, improving access to land, providing basic infrastructure, and improving the efficiency of accelerating mortgage registration and title transfers. Governments have a responsibility of providing bulk infrastructure and services for its citizens. These include roads, which directly impact on the accessibility and suitability of locations for housing. The same responsibility applies to provision of security for citizens within all areas their jurisdictions.

Provision of incentives such as tax rebates and reliefs, as well as subsidies are some of the ways governments can temporarily boost supply and demand for housing for as long as they are in place. In Kenya, the government put in place a number of incentives towards affordable housing between 2017-2022 as detailed below (AHP 2017):

- Value Added Tax:- GoK gave VAT exemption on importation and local purchase of goods for the construction of houses under the affordable housing scheme upon recommendation by the CS responsible for housing.
- Corporate Tax:- Lower corporate tax rate to 15% for developers of over 100 units which would allow for lower unit prices without sacrificing developer target net profit.
- Import Levies:-Import Declaration Fee (IDF) for goods imported for construction of houses under the affordable housing scheme was capped at 2% while it was at 3.5% for other imports.
- Railway Development Levy (RDL) was capped at 1.5% for affordable housing imports while it remained at 2% for other imports.
- Affordable Housing Tax Relief :- 15% tax relief on savings/contribution to drive savings towards home ownership.
- Stamp duty exemption from the otherwise mandatory 4% (urban areas) and 2% (rural areas) stamp duty for first time buyers of houses under the affordable housing scheme.

- Provision of public land for construction of affordable housing, thereby providing private developers with the most vital element of a housing project.

2.3.1.1 Demand side of housing:

The effective demand for housing is determined by a number of factors. This include the ability of potential residents to adequately have access to finance to enable them rent or purchase housing, their willingness to do so, and the availability of suitable housing products in the market(CAHF,2019). These include economic and financial factors that affect demand and ability to access housing at individual level and also affect supply from the developers' perspective; both public and private. The following factors affect demand for housing under economic factors:

a) Income levels

Income is a major determinant of the demand for housing. Economic growth levels and household incomes levels are directly proportional to the ability of people to spend more on houses as the rents and buying prices are well within affordable limits. The Kenya National Bureau of Statistics (2019) indicated that 74% of employed Kenyans earn less than KShs.50,000 per month, and this serves as a guide of what would constitute affordable housing.

b) Affordability

Affordable housing is largely understood to refer to housing that costs less than 30% of a household's income and that which does not affect the ability to provide for other needs such as food, transportation and healthcare. Public housing for instance should therefore be designed with considerations to guidelines on income as given by the Kenya National Bureau of Statistics. If this is not well considered, the effect is that the working class who have occupied the areas prior to redevelopment may be forced out as their income levels may not afford the houses therein. They then are forced to seek residence in informal settlements and slums as the transformed inner city areas are occupied by middle class residents who are able to meet the higher costs of purchasing, renting and maintaining the new houses. The neighborhoods thus become gentrified, shifting their composition, history and culture. The intervention of the government is critical to ensure development of housing that is affordable to the current inhabitants of inner city areas in parts of the inner city areas, and professionals in the urban design and built environment spaces, alongside others, need to advise the government on the best way to get this done.

c)Interest rates

On the demand side of housing, interest rates affect the cost of borrowed loans as well as monthly mortgage payments. Consequently, high-interest rates will lead to increased cost of mortgage payments which in effect will lead to lower demand for buying a house, and the net effect of this is that it may make renting relatively more attractive as compared to buying. Owiro (2022) gives the example of UK in 1990-92, when a sharp increase in interest rates caused a very steep fall in the demand for housing.

d)Availability of finance

The ability of people to buy or rent housing is dependant on the availability and access to finance. In Kenya, just like in many LDC, the percentage of citizens who qualify to access mortgages and bank loans is limited. Thus need to look elsewhere for alternative modes of raising money for home acquisition. According to Owiro(2011); there was a boom in Kenya between 2004-2006, a period during which many banks were very keen to lend mortgages and banks required very low deposits (e.g. 100% mortgages). He postulates that this ease of getting a mortgage meant that demand for housing increased as more people were now able to afford houses. For civil servants in Kenya, the civil servants housing scheme fund has devised the Kenya Mortgage Refinance Company, which lends money to civil servants to enable them own homes. According to Cytton(2018) the availability of financing is impossible even to a good proportion of the employed population in many LDCs as they do not earn the required minimum basic salary ,which he estimates at one hundred thousand Kenya shillings(Cytton, 2018). This means that most of the individuals in the informal sector do not qualify for the rigid mortgage requirements. Hence need for innovative financing models for public housing, such as tenant purchase schemes and promotion of sustainable saving schemes.

e)Security of tenure

Security of tenure refers to guaranteed possession of property as evidenced by ownership documents such as a title deed to the property in question. The Sectional Properties Act of 2020 allows for sub-division of buildings into units which can then be owned by private individuals. In the case of the proposed public housing projects and the recently completed ones, individuals legally own the houses that they buy. There have been scholarly arguments about privatization of public urban spaces. One of the arguments is **The Right to the city concept** which defends the idea that public urban spaces should be left public so as to enable them to be inclusive, democratic, accessible to all residents and aims to address the inequalities that result from possible commodification and capitalist control of urban spaces.

The challenge with urban redevelopment projects is that they often encourage the displacement and eviction of local inhabitants, both during the process of renewal where they have to relocate for the redevelopment to be undertaken or after due to gentrification as they cannot afford the redeveloped housing (Weinstein & Ren, 2009). This affects homeowners and public housing tenants alike as noted by Power (2008). Weinstein and Ren(2009) note that ownership structures are also subjected to change as land is subjected to privatization or 'leased to private developers for redevelopment'. In the case of the Nairobi's inner city area projects, project developers have been compelled to ensure the inhabitants would not be displaced, often through the intervention of court orders. This has been the case in Old and New Ngara as well as Pangani estates.

2.3.2 Physical and Environmental Factors

Environmental factors refer to both the natural environment and the built environment. The relationship between the two is a symbiotic one, with each depending on the other for survival. A sustainable built environment protects and enhances the natural environment whilst protecting its inhabitants from its harsh elements. This by extension enhances people's lives and health.

UN (2023) notes that global warming and climate change are at an all-time high as a result of increased emissions of greenhouse gases which blanket the Earth and trap the sun's heat. The world is now warming faster than at any point in recorded history (UN, 2017). This has been mostly attributable to human activities. As temperatures get increasingly warmer over time, weather patterns are altered and the result is a disruption of the usual balance of nature thereby posing many risks to human beings and all other forms of life on earth. The recent century has seen negative impacts on the environment including coral bleaching, floods, droughts and hurricanes. The building sector is the second largest contributor to global greenhouse gas emissions after fossil fuels (UN, 2023), with the construction phase having a 13% impact, the operation phase having an estimated impact of 85% and the demolition phase having an estimated impact of 2%.

Urbanization today has a direct impact on both the built and the natural environment, as increased demand for housing translates to construction of more housing units and increased human activity therein has a direct implication on emission of carbon and greenhouse gases to the environment.

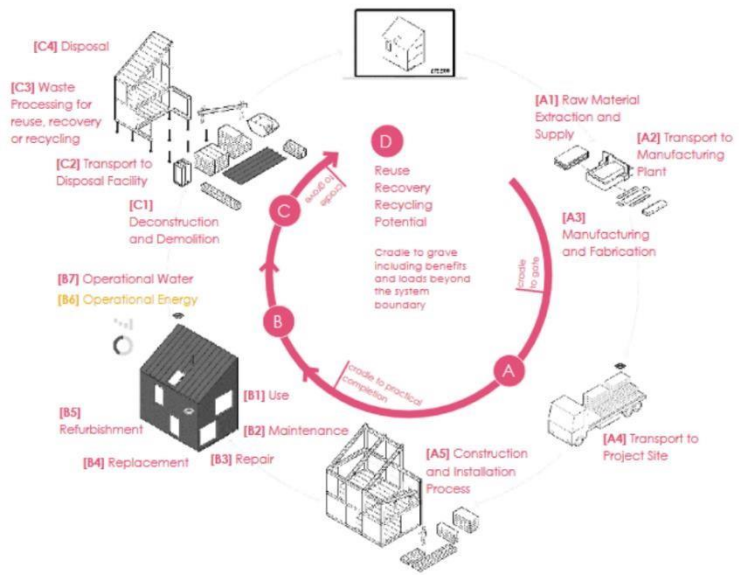


Fig 2.2 The lifecycle of construction (Source:Construction Journal 2017)

In Nairobi city alone in the year 2022, 25% of carbon emissions was attributed to the built environment (Rukunda,2023). This causes deterioration of naturally occurring elements such as the ozone layer thereby causing climate change and global warming in the long run. Poorly designed indoor spaces also cause human discomfort potentially cause sick-building syndrome. The challenge of contemporary development is to ensure environmental priorities are balanced alongside socio-economic development, including economic growth, human health and equity. Direct environmental impacts of current development patterns such as the ongoing high density highrise housing projects include global warming, habitat loss and fragmentation, poor waste management practices, degradation of water resources and water quality.

To mitigate against deterioration of the natural environment and ensure creation of healthy residential spaces for the massive housing projects being undertaken within Nairobi's inner city areas caution needs to be taken from the site planning stage right to the end of life of a building. The following sections highlight the key considerations that should be taken at each stage with the view to develop green buildings which abide to principles of sustainable energy sources, waste management, the conservation of energy, and the reuse and safety of building materials.

2.3.2.1 Site selection and planning

Sustainable strategies pertaining to selection of a site and planning in the development of green and sustainable buildings include;

i)Protection of sensitive sites. These include water catchment areas, public open spaces, forests etc.

ii)Preserving undeveloped sites: - Reusing sites that were previously developed ensures minimal land disturbances to previously undisturbed land. Such sites, as in the case of inner city areas, are close to public transportation, community and work centers, and services such as pumping water and transporting electricity. Besides, there are numerous reasons for preserving open, undeveloped spaces. The main benefits fall into four general categories:

- Environmental- Reducing impact on flora and fauna such as minimal cutting down of trees to make space for new housing, protecting groundwater, wildlife habitat etc.
- Agricultural-Preserving urban agriculture, industries and communities
- Aesthetic-preserving rural character and scenic beauty
- Managing growth.

iii)Promoting connection to the community through provision of interconnectivity of streets, compactness and walkable streets.

iv)Minimizing transportation by selecting sites where live, work and play principles are made possible help to decrease use of motorized transport transportation distances, impacts both the environment and energy use. This ought to be the case of inner city housing, if well adhered to. The use of less polluting modes of transport should be encouraged through provision of infrastructure to enable their use. These include cycling paths and walkways.

v) Geometry of buildings: In order to ensure the viability of specific building integrated solar systems (BISTS, BIPV) in the current urban fabric, there is need to determine the optimum geometry of the building blocks. The parameters are the ratio between the length and the width of the building blocks, the width of the streets between them, the height of the buildings and the geometry of the buildings that can be accommodated in the proposed building blocks. The buildings' geometries are determined in ways that they could accommodate apartments in a viable way in order to create sustainable neighborhoods.

v)Provision of defensible spaces: The defensible space theory, made by *Jane Jacobs* links crime rates to urban planning (Newman, 1972). The applicable intention is to create a physical and social structure that helps the residents to gain control over the area surrounding their homes with established common values and lifestyles (Newman, 1996).

In summary, the theory suggests that the physical design of a living environment can be used to reduce crime. The argument was that isolated, dark, closed-off spaces fostered street crime, while visibility acted as a deterrent. Her ideas influenced both the theory and practice of environmental design towards prevention of crime with urban spaces. Newman later elaborated this theory by proposing four key concepts in his theory and design principles. These were territoriality, surveillance, image, and milieu. Newman suggests that physical spaces can be designed to create areas of territorial influence. Physical elements or markers can be used to define private or semi-private spaces that encourage residents to assume more responsibility for the areas than they would if the areas were fully public spaces. Physical subdivisions that create smaller spaces can encourage occupants to adopt a sense of ownership of the spaces thus acting as deterrents to crime as they will be concerned for them, and exert more control over the activities occurring in them. These elements or markers can be real (e.g., fences, gates) or symbolic (e.g., signs,plantings) and serve to discourage outsiders from intruding into the areas to commit crime.

ti)Accessibility: Concerned with The ability to move freely and easily by all members of a society as this bears great benefit to their well-being. This is promoted through provision of proper access to various facilities and amenities for people across different ages and physical conditions (Chan, Lee, 2008). Power (2008) explains that another key consideration while selecting a site for mass housing should be location and proximity to major employment and services in order to reduce environmental impact as a result of the need use of motorized transport (p. 4490). Nairobi has battled with poor quality roads and traffic congestion, especially in densely populated areas. Vehicular accesses, pedestrian walkways, ramps, cyclist paths, proper storm water drainages and provision of security lights all contribute towards promotion of accessibility for all.

2.3.2.2 Material and resource efficiency

At construction stage, the key consideration is the choice of materials for construction. This bears direct impact on the quality of indoor space created as well as on the natural environment (Ruuska, 2014). Material efficiency aims to reduce the impacts associated with material consumption and sustainable strategies include use of locally available materials, re-using material components to avoid waste, and reducing the amount of

construction material through a lightweight product design. Resource efficiency means optimal use of energy, natural resources, and materials, in order to create products and services with less resources and less impact on the environment (Ruuska, 2014). Some of the ways that these two strategies can be used effectively include;

a) Use of materials with low embodied energy

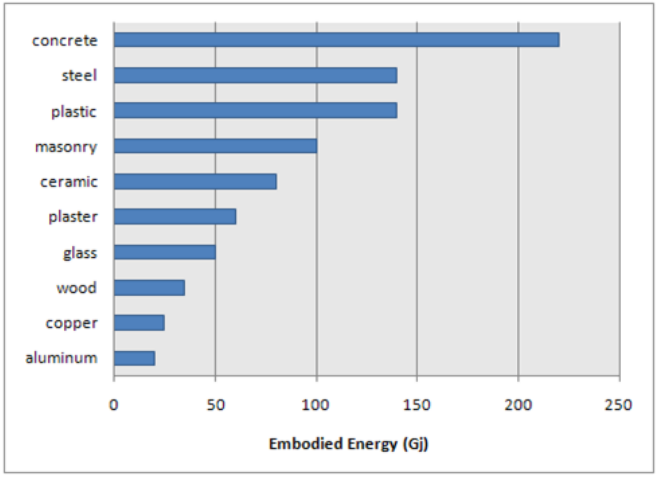


Fig 2.3: Building materials embodied energy
Source:The Costa Rica Building Society

The building sector has been rated the second largest contributor to global greenhouse gas emissions after the mining industry (Ruuska, 2014). There is however huge potential for reducing emissions through material efficiency and this has a significant role in reducing the global GHG emissions from buildings (Ruuska, 2014).

Greenhouse gas emissions from buildings are a sum total of the embodied energy of building materials, the emissions from the operation of the building and the disassembly of the building at the end of its life. It follows therefore that the selection of materials is becoming increasingly important. Initial material consumption includes the energy used to produce the material, transport the material to the site and place it in the required spot as a component of the building. The energy consumption of interior renovations over the lifetime of a building can account for some 20% to 30% of the initial embodied energy.The need of this recurrent embodied energy can be almost halved, with the use of materials with longer service life (Ruuska, 2014). It is therefore prudent to use materials that are locally available and that have a low embodied energy as per the table above.

2.3.2.3 Energy efficiency

At operation stage, the key considerations lie in energy efficiency and waste management. In general, energy efficiency refers to optimal use of energy with the aim of using less energy to produce the same result. In the circle of housing, energy-efficient housing refers to buildings that use less energy to heat, cool, and run appliances and electronics. Principles such as natural lighting and ventilation play a role is minimizing the use of

artificial energy. Highrise buildings that require constant use of lifts are not considered energy efficient, hence need to critically review the densification strategies to include use of renewable energy.

The United Nations(UNEP,2021) observes that energy efficiency is one of the most sustainable and cost effective measures countries can take in preserving the environment. At house level, energy efficient technologies can be adopted such as LED based lighting which ultimately uses less energy while providing comparable light output. Such technologies substantially reduce GHG emissions while providing other benefits such as economic development, job creation, reduction of pollution, improvement in human health, and alleviation of poverty. A sustainable strategy to ensure minimization of operational energy within the built environment is to ensure use of natural light and natural ventilation. This is through provision of adequately-sized openings, provision of permanent ventilations, adequate spacing between highrise blocks and proper orientation of blocks to ensure air floor. Narrow plans are an effective design strategy to ensure these sustainable principles are met.

2.3.2.4 Solid waste management

Solid waste refers to the range of garbage arising from animal and human activities that are discarded as unwanted and useless and is categorized based on material into inorganic and organic waste. Categorization may also be based on hazard potential, including radioactive, flammable, infectious, toxic, or non-toxic. Categories may also pertain to the origin of waste, such as industrial, domestic, commercial, institutional or construction and demolition. Solid Waste generation has become an inevitable consequence of lifestyles and daily living. However, the nature (quantity and quality) of this waste stream can vary and is largely dependent upon the manner in which waste production is managed, by both government and the public. The oldest and most common method of disposing waste in many parts of the world especially in LDC is dumping garbage in landfills.

Fig 2.4 The Dandora landfill in Dandora, Nairobi. Source:Gakungu,2011

The costs that come with this kind of waste disposal are relatively lower than for all other methods, hence the reason why it is the most common of them all. In Kenya, the challenge of solid waste management is dire (Gakungu, 2011), due to inefficiencies in collection and disposal systems, which are not friendly to the environment. 30-40 per cent of all solid waste generated in urban areas is uncollected and less than 50 percent of the population is served (Otieno, 2010). This has become a major contributor to global warming from the built environment as solid waste landfills have been found to be the single largest man-made source of methane gas in the world today. Methane (CH4) is a powerful greenhouse gas that has been found to be 23 times more effective at trapping heat in the atmosphere than the most prevalent greenhouse gas—carbon dioxide (CO2). Solid Waste Management is defined as the discipline associated with control of generation, storage, collection, transport or transfer, processing and disposal of solid waste materials in a way that best addresses the range of public health, conservation, economics, aesthetic, engineering and other environmental considerations.

Though there is only so much that the architect can do to influence the amount of waste generated by a household, he can, through provision of storage space encourage reuse of some things that would otherwise be thrown away e.g bottles and storage containers such as those of cooking oil. Architects and urban designers have an obligation to make spatial provisions for this activity. Possible solutions include:

i. Waste bins placed at the sites which generate sufficient waste.
ii. Storage spaces for instance, under stairs, wall niches, kitchen cabinets etc.
iii. within buildings where trash can be put awaiting collection.
iv. Outdoor open spaces where garbage can be properly stored as it awaits collection.
v. Provision of rubbish chutes to direct garbage to a specific point for collection.
vi.Design elements such as rubbish chutes, spaces allocated for storage and sorting are also part of this stage.

Fig 2.5: Ideal waste management diagram Source:Otieno,2010

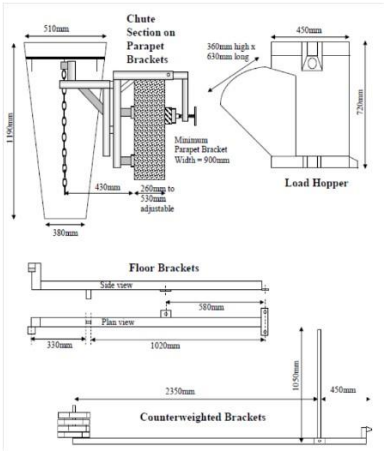
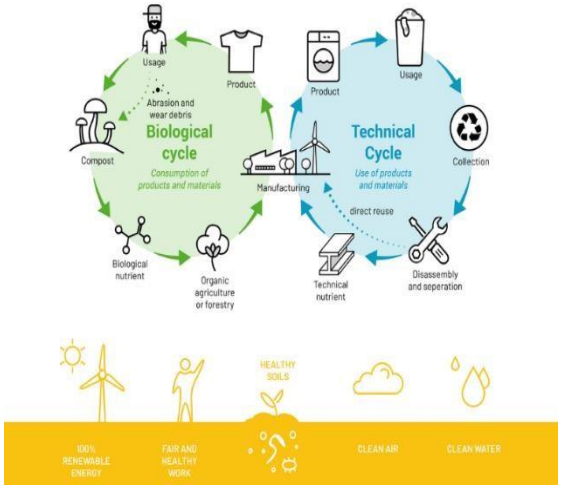


Fig 2.6: Rubbish chute details

2.3.2.4 End of life stage (The Cradle to cradle approach)



This is a design philosophy devised by William McDonough and Michael Braungart in which raw materials are not thrown away(cradle-to-grave) but are re-used indefinitely as ‘food’ for new products(Akim, 2017). Products under the cradle-to-cradle approach must therefore be fully recyclable. This includes designing for disassembly of buildings and adaptation of buildings for other uses whilst predicting behavioral patterns. The key advantage of this approach is that it reduces the environmental impact as it keeps materials in the economic loop and saves energy during production.

Fig 2.7: A diagramatic illustration of the cradle to cradle cycle Source:Akim,2017

2.3.3 Social Factors

Social factors refer to those that relate to human society, the interaction of the individual and the group, or the welfare of human beings as members of society (Oxford dictionary). There are several social factors that influence the demand, supply, adequacy and accessibility of housing. These factors include:

2.3.3.1 Demographic factors

Demographic factors refer to distinct characteristics that describes the composition of a population. Some examples of demographics are **age, sex, education, nationality, ethnicity, or religion**. In housing, these factors influence the type of housing to be built, the typology, the quality and the pricing. Understanding and accommodating each of the defined groups is critical in ensuring inclusivity, which is a vital ingredient for creating sustainable communities and societies. Understanding of the following needs by demographia;

a)Gender

The Un Publication on Women and Housing: Towards Inclusive Cities (2014) recognizes the complex terrain of diverse women's unrealized right to adequate housing and the consequent negative implications for urban sustainability. It portends that in most developing countries there are gender gaps in housing policies and the lack of a gender analysis in housing policies overall. In Kenya, the total % of the female gender in the civil service was reported at 49.21% in 2020 according to the World Bank collection of development indicators, and was among the highest scores ever recorded. In consideration of the current policy that 60% of the affordable housing projects being reserved for civil servants; it follows that there will be less women beneficiaries for the units as opposed to their male counterparts.

b) Age

The age of a population influences the trajectory a development takes. For instance, areas in close proximity to tertiary learning institutions will have more of hostels, bedsitters and one bedroom dwellings whereas areas further away will have other typologies ideal for family compositions. The age composition also determines provision of physical and social infrastructure such as playgrounds, community halls, access facilities such as ramps etc.

c)Family structure

This depends on household compositions in terms of size and age, and determines requirements of house sizes and typologies. Adequacy levels vary depending on the structure of different families. The birth of children and the independence of them is the main clue of the change of the

family structure, hence need to develop housing that is adaptable and diverse to allow for accommodation of families through the seasons of the changing family structure (Shen, 2015).

d)Income levels:

In terms of income levels, Cytton(2018) notes that low income earners often settle for lee than adequate forms of housing as that is what is affordable to them. This is mostly on rental terms as they cannot meet the costs for ownership of the houses(Cytton,2018). Good quality housing projects that check all the boxes of adequate housing often target middle income groups and high net worth individuals. These are mostly done by private developers.

The other bias is that of financial institutions. On the demand side, financial institutions often provide finance facilities to salaried individuals as opposed to individuals working in the informal sector. The result of this is gentrification, a process of urban development in which a city neighborhood develops rapidly over a short time, changing from low to high value. A neighborhood's residents are often displaced by rising rents and living costs brought about by gentrification (Picardo,2022).

On the supply-side of housing, financial institutions are biased towards providing finance to developers that they have been involved with over long periods of time thereby disadvantaging upcoming developers who are embracing low-cost methods of construction. The result of this is that quantitative challenges are sustained, especially disadvantaging the low income segments of the population (Ojijo 2013).

2.3.3.2 Cultural factors:

Housing is considered adequate if it among other factors,respects the expression of cultural identity. Cultural identity refers to identification with, or sense of belonging to, a particular group based on various cultural categories, including nationality, ethnicity, race, gender, and religion. Castells(2004) defines cultural identity as the process by which a group of people builds its own meaning according to attributes that it identifies with. It is constructed and maintained through the process of sharing collective knowledge such as traditions, heritage, language, aesthetics, norms and custom. Yasser, M (2009) observes that the beginning of the twenty first century was marked by increasing globalization and the affirmation of a singular identity that was in constant tension with traditional local identities and this birthed the spread of the international style during the second half of the twentieth century. Expressions of cultural identity in space can be through the built form, choice of materials. spatial organization and activities allowed for within a space.

Adequate housing should achieve a balanced realization of all these seven elements. These elements form the interface between urban design professionals and those in other sectors such as economic and sociology sectors. This study will adopt them as the basic criteria to measure of adequacy of the affordable housing programs in Kenya today.

2.3.3.3 Citizen participation

Citizen participation has been identified as an effective driver in sustainable development of housing projects, especially in developing countries, as well as a critical determinant of the success and failure of these housing projects (Jiwane,2020). In Kenya it is covered under Article 174 (1) of the Constitution of Kenya 2010. It entails involvement of citizens in processes that affect them, in this case through planning and design stagesas well as in the decision making process (Moser, 1989). Controversy and disputes between the residents and developers has been a hindrance to urban redevelopment in Nairobi's inner city areas. Case in point is the legal tussle between the county government (which owns a substantial stake of land and houses in inner city areas) and their tenants.

This has been attributed to lack of public participation and proper communication between the land owners/developers (such as NCCG and Kenya Railways) and its tenants and as a result there have been complaints of forceful evictions from tenants, as they are evicted from the houses they occupy to allow for redevelopment. This has often ended up as legal suits and in return, delaying progress of the intended housing projects. This was and has been the case for civil servants' estate as well as Old and New Ngara and Pangani.

2.3.3.4 Social Services and Social infrastructure:

Social amenities that are critical to the well-being of a community and amount to provision of decent housing include physical facilities such as schools and hospitals (Chan, Lee, 2008). Other amenities such as sports or leisure facilities ensure for a better and more pleasant living environment. Incorporation of facilities that ensure inclusivity in use also need to be put in place for vulnerable groups. These include ramps for the disabled and the elderly, playgrounds for children and community meeting spaces such as halls and pockets of outdoor spaces to encourage social interaction of residents (Chan and Lee, 2008).

2.3.3.4 Job Availability

This has been identified as a core driver of urbanization (Byerlee, 1974). Chan and Lee (2008) state that apart from work places providing individuals with sources of income, they also act as places for social interaction contribute to their well being eventually. They also note that increased employment leads to a reduction of other social problems such as crime, social exclusion and poverty.

2.4 Housing in Inner City Areas

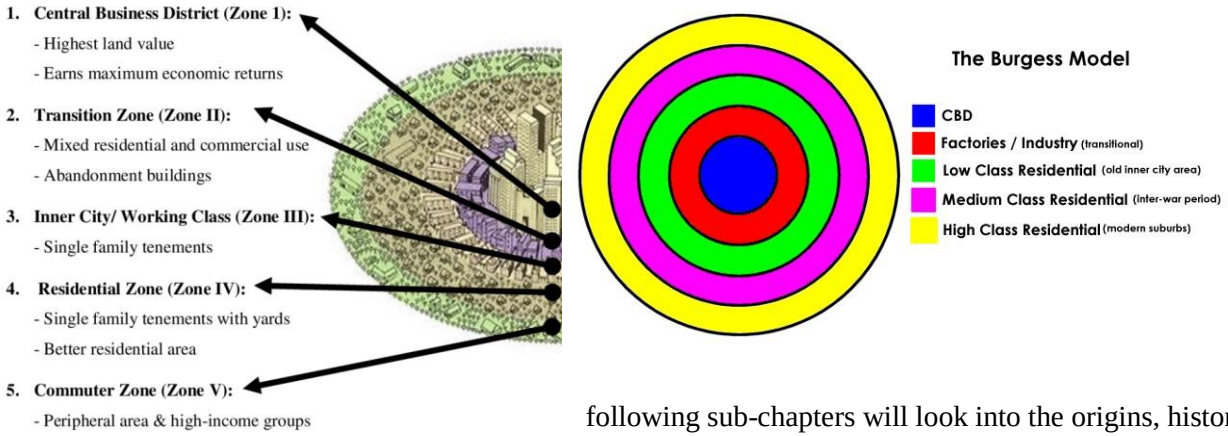


Fig 2.8 The concentric zone model;Burgess (1927)

The Oxford dictionary defines an inner city as an area near the center of a city, especially when associated with social and economic problems. In urban design circles, an inner city area is defined as area surrounding the CBD with its basis on the concentric zone model (also known as the Burgess model). The following sub-chapters will look into the origins, history and current status of housing in inner city areas.

2.4.1 The origins of the inner city

The inner city concept was popularized through writings of white liberal Protestants in the U.S in which inner city areas were defined by their geographic locations i.e near CBDs as well as their derogatory cultural connotation associated with the black community and as a euphemism for lower income residential districts often run down and decayed. Zone 3, the inner city was characteristically a predominantly residential zone occupied by low income groups and with a mix of new and old developments. It was typically characterized by large rental housing occupied by single workers, and often run down and in need of transformation interventions.

2.4.2 The case of Nairobi's inner city areas

Nairobi's initial urban land use plans were modelled along the concentric zone model. Areas closest to the train station(CBD) and the industrial area (Zone 2) were demarcated residential areas of citizens of Kenyan heritage and characteristically had poor, non-porous black cotton soils and poor drainage often resulting in flooding and increased frequency of malaria. Zone 3 areas which included Ngara and Parklands were typically allocated to citizens of Indian descent. European settlers resided to the North and West of the city, which were areas with higher altitudes and rich red soils (Owuor and Mbatia, 2008).

According to Khaoya(2008) the general residential layout in Nairobi since 1950 was such that Kenya Railways' low level workers (mostly Africans) were housed along Landhies Road(Zone II),in one-roomed structures that were considered too small for families. and later in bigger units within Muthurwa flats (Aluanga, 2006). Medium level workers (mostly Asians) were housed in Ngara estate (Zone III) and the high level workers (mostly white) were housed in the peripheral estates far from the CBD(Zone V). With Kenya gaining independence in 1963, restrictions to rural-urban migration were lifted. This had a major impact on the inner city areas such as Ngara and Pangani. Africans were able to inhabit the previously predominantly Asian inner city areas. The target population for living in inner city areas became the working class of Kenyan descent who were typically relatively low income, hence the need for housing that they could afford.

In his study of Nairobi's inner city areas, Shihembetsa(1995) observed that public housing forms a large percentage of inner city areas just as in many countries of Sub-Saharan Africa and that the said housing, often located within a radius of 6 Kilometers of the CBD remains the cheapest in terms of rent. Because the location of the inner city areas of cities generally gives a central location in terms of distances to the two major employment centers i.e the Central Business District (CBD) and the industrial area; demand for housing is generally higher (Haase et al. 2011). as people choose to take advantage of the above average existing infrastructure, social faciliities and the easy accessibility to workplaces and leisure-time activities (Khaoya,2008). This has been evidenced by the earmarking of the inner city areas for urban renewal projects proposed in Ngara by NCCG and AHP in Ngara.

The initial residential developments in Nairobi's inner city areas such as Ngara, Shauri Moyo, Makongeni, Jericho, Parklands and Makadara were single family bungalow units set on relatively large parcels of land. These housing units were predominantly owned by Kenya Railways and the then Nairobi Municipal Council (Owuor and Mbatia, 2008). As is characteristic to inner city areas globally, many of Nairobi's inner city areas are

facing the challenge of urban decay indicated by deteriorating physical, social, environmental and economic conditions (Musyoka,2016). Often, urban decay leads to population flight where the well-to-do population from decaying inner city areas migrate to better areas often with better social and physical infrastructure. This population may be replaced by a poorer population.

It is also worth noting that inner city areas have a high potential for the urban poor in terms of the opportunities to earn them a living as compared to the peripheral sites of the city (Shihembetsa, 1995). This is especially so because of the high population density in the CBD which affords people opportunities for formal and informal income earning economic and public activities (Shihembetsa, 1995).

Couch(2009) asserts that cities are constantly undergoing change and that the changes bring about challenges and opportunities which require innovative planning interventions. Such is the case for inner city areas. Urban renewal approaches as discussed in the next section are possible for inner city areas because governments own substantial stakes in terms of land in these areas hence acquisition of large tracts of land for such development is made easier.

2.5 Urban Renewal Approaches

Cities everywhere are dynamic and constantly undergoing changes in form of building, expansion, contraction, maintenance, decline, repair, demolition, and rebuilding (Koebel, 1996). The remedy to this phenomenon of the city is to innovatively and sustainably re-plan these neighborhoods so that they are able to meet present and future needs. Gibson and Langstaff (1982) define urban renewal as the redevelopment or rehabilitation of decaying, older parts of urban centers through improvement of housing and environmental conditions, social services and infrastructure needs, economic regeneration and employment provision through state and local authority interventions. Urban Renewal has been hailed as a powerful force for urban change (Mutuli,2016).

Urban renewal has its roots in the overcrowding, unsanitary house conditions and environmental degradation brought about by industrialization and urbanization during the industrial revolution (Broudehoux, 1994). Efforts by various movements such as the City Beautiful Movement and Ebenezer Howard's Garden City Movement to rejuvenate the areas affected (Holcomb and Beauregard, 1981) were borne out of this.

Approaches of urban renewal include;

- Rehabilitation, Upgrading approaches

- Conservation and preservation approaches
- Redevelopment approach (Partial and Total)
- Privatization approach
- Integrated approach

2.5.1 Rehabilitation and upgrading approaches

Rehabilitation is based on repairing and restoring the natural and man-made environments of existing neighborhoods and is applicable to areas where buildings are generally in structurally sound conditions but have deteriorated because of neglected maintenance. Citizen participation is an important aspect of this urban renewal approach as the target population is already on site (UNCHS, 1991). This has been the case for brownfield upgrading and rehabilitation projects for housing in Nairobi's slums and informal areas under NGOs, CBO as well as under KENSUP. Case in point are housing upgrading projects by Muungano Support Trust and Akiba Mashinani Trust in Huruma's Kambi Moto and Mathare.

Mutuli (2016) asserts that rehabilitation can be limited due to technical complexities and copious amounts of time-consuming research involved. She further observes that high social organization skills and social responsibility levels are required for the approach to be a success.

2.5.2 Conservation and preservation approaches

This approach recognizes the value of old neighborhoods and focuses on preservation of what is unique, ancient, and specifically local (Mutuli ,2016). Its greatest strength as far as housing projects are concerned is that it takes advantage of the existing housing and adapts old houses to present-day life and brings them to acceptable standards by providing modern facilities (Miller, 1959 in Broudehoux, 1994).
On the downside however, old houses are often so dilapidated to salvage and even then their original character may have been lost hence making it unrealistic to attempt to conserve them or to raise their conditions to appropriate standards (Mutuli, 2016).

2.5.3 Redevelopment Approach (Partial and Total)

Urban redevelopment involves demolition of original existing buildings in an area earmarked for redevelopment and in their place, reconstructing new buildings and improving public facilities often allowing the land use or usage density to be altered (Couch,2009). This approach is suitable for

areas in which buildings are totally deteriorated, do not serve the present user needs, have no preservation value, or in which the arrangement of buildings is such that the area cannot provide satisfactory living conditions. This is usually for purposes of slum clearance, replacing neighborhoods with decent and affordable housing, improved and well serviced buildings and crime reduction as dilapidated houses and estates seem to be abandoned and are dangerous as they house those who do crime (Mutuli,2016).

Redevelopment has its origins in the industrial revolution when there was a dire need of stepping up the supply of housing units due to an influx of population in urban areas, a need to replace back-to-back row housing and to improve sanitation, infrastructure and services (Couch, 1990). Mwaura (2001) observes that redevelopment presents developers with an opportunity for maximum profit through the sale of new centrally located units as in the case of inner city area redevelopment. Akatsa (1984), postulates that redevelopment should seek to incorporate harmonic integration through consideration of existing building form, proportions, scales, heights and widths, projecting canopies etc and harmonic contrasts through creation of appropriate visual contrasts through juxtaposing of old buildings and new buildings with new functions, new building materials and character.

On the negative side, redevelopment is responsible for a number of social and environmental effects. First is the loss of the cultural heritage of a place and a people and destruction of viable neighborhoods thereby depriving people of valuable housing resources which in many cases still serve a useful function. hat arises from the demolition of architectural environments and (Mutuli,2016). This has been observed in the case of Nairobi's Ngara estate where some Asian families in New Ngara estate have decried a looming loss of what they consider ancestral homes as the houses have been passed down generations (Mutuli,2016). Tenants, owners and businessmen suffer social and psychological losses as the destruction not only affects old buildings but also a functioning social system and is especially harmful to the older people(Mutuli,2016). Broudehoux (1994) observes that majority of western countries have done away with redevelopment as a means to rejuvenate old urban centers and have instead adopted an integrated approach to urban transformation.

2.5.4 Privatization Approach

Privatization of housing sector essentially refers to changing of housing and housing service provision from being publicly owned to being privately owned. The goal of this approach is to improve the quality and the standards of the services to the public motivated by the fact that there is laxity experienced in the public sector leading to poor delivery of services and urban decay. The government may lease or sell its property to

private developers. The merits of the privatization approach are that it allows for construction of better quality housing due to availability of more funds, and also improve service provision. On the flipside, this approach makes housing units unaffordable to some low income earners.

2.5.5 Integrated Approach

This approach is mainly an integration of the rehabilitation approach and the redevelopment approach and combines the best aspects of each(Mutuli,2016) through rehabilitation of what can realistically be saved and reconstruction of new buildings where existing ones are beyond feasible rehabilitation. It is generally considered to be the most acceptable way to regenerate old neighborhoods presently as it allows for flexible preservation of the traditional urban environment while achieving respectable densities and shows consideration for the social order of the community by allowing for substantial re-housing of the majority of original residents of a place. The result is the creation of rich integrated environments with harmonic integration of new and old developments while maintaining their identity.

2.6 History of Housing Policy in Kenya

2.6.1 Pre-Independence housing

Before Kenya gained independence, housing provision and policy was based on highly segregated systems aided by the state in an endeavor to favor the white elite. Distinctive wealthy and impoverished urban zones marked with disparities in distribution of housing and other privileges such as employment opportunities, access to land, access to infrastructure, education and health were systemized. Government a hierarchic order of public housing that reserved the best housing for the Europeans followed by Asians and lastly by Africans. The limitation in the number of Africans in urban areas by the colonial government in urban areas necessitated provision of only 'bachelor' housing for unaccompanied African men who worked in urban areas. After 1939, encouraged by London, the Kenyan government began to ease movement to urban areas and the increased permanent presence of Africans in towns put more pressure on provision of housing. Municipalities then revamped plans for new types of housing and more community facilities in new types of neighborhood layouts with majority of the housing focused on bachelor housing and with little consideration for family set-ups, and compensation was mainly through rental subsidies. Although Kenya's housing initiatives in the late colonial period did not satisfy all of the rapidly growing urban needs, they were a substantial achievement.

2.6.2 Post-independence housing policies

Upon Kenya obtaining its independence in 1963, there was a major shift as restrictions to rural-urban migration were lifted and more people moved from rural areas into urban areas such as Nairobi. As urbanization took a sharp tangent upwards, the rate of industrialization was not commensurate. Thus the rapid urbanization without comparable industrialization became the genesis of the challenges to urban housing that continue to haunt urban housing in Kenya today, inner city areas included. Various housing policies were adopted to deal with the increasing challenges to housing in urban areas. These included:

a) Sessional Paper No. 5 of 1966/67
b) National Shelter Strategy to the Year 2000
c) Sessional Paper No.3 of Year 2004
d) The Kenya Slum Upgrading Program (KENSUP) of 2005
e) Vision 2030 (2008)
f) The National housing policy (2016)
g) The Affordable Housing Policy (2017)

2.6.3 The affordable housing policy, 2017

This study focuses on this policy, as it has direct impact on the project under study. The affordable housing program(AHP) was borne by GoK (2017-2022) under the Big Four Action Plan and premised on article 43(1b) of the Kenyan constitution primarily tailored to provide decent social and affordable housing for lower income segments of Kenya's population and to promote home ownership for the group that is often not able to in the open market due to the prohibitive land and construction costs and stringent financing requirements.

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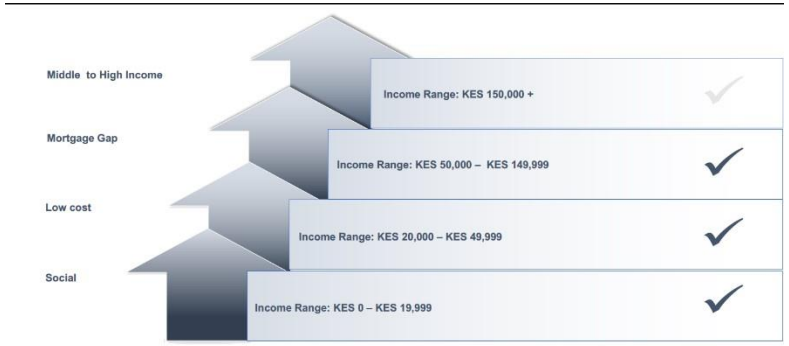


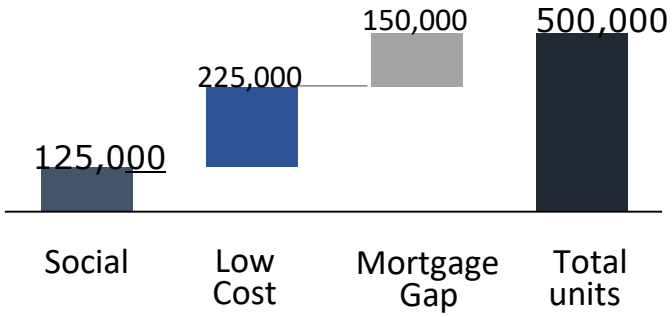


Fig 2.9 Target income groups for AHP (Source AHP 2017)

Fig 2.10 Housing spread for the affordable homes(Source AHP 2017)

The income groups targeted for housing under the program ranged from KShs.0-149,999. The proposed spread for the houses was 25% social housing for the group earning between KShs.0-19,999, 45% low cost housing for the group earning between KShs. 20,000-49,999, and 30% mortgage housing for the group earning between KShs.50,000-149,999. In estates such as Ngara that have historically been dynamic in terms of residency and home to people across diverse income groups as observed by Khaoya(2008), it would be imperative to develop housing that would accommodate all the three income segments in line with the proposed AHP policy housing spread. The modus operandi for the AHP was government partnering with strategic partners in the delivery of houses, often with GoK providing land while partnering organizations financed construction of housing units.

Other aims of AHP included increasing contribution of real estate and construction to GDP from 7% to 14% , creation of 3-5 direct /8indirect jobs per unit constructed and to give life to the informal sector through ringfencing strategies for jua kali and light industries.

Fig 2.11 AHP main objectives (Source AHP 2017)

To achieve AHP goals, GoK intended to deploy a raft of strategies which included provision of public land and bulk infrastructure, provision of tax incentives for both developers and potential home owners such as waving stamp duty for first time owners and getting into strategic

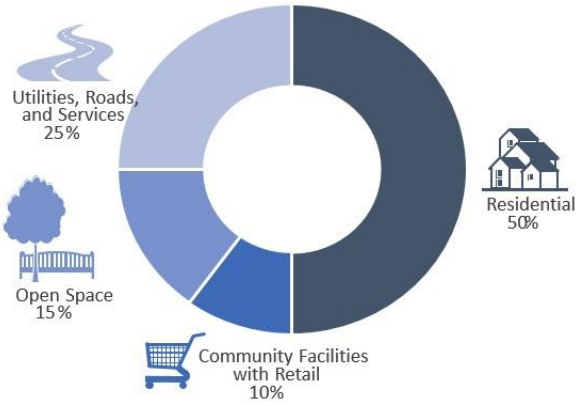
partnerships to raise capital through PPPs and JVs. In this partnerships, the onus of innovation in bringing the cost down would be left to developers with GoK capping of costs at offtake.

Typology	Minimum Size(sqm)	Cost(KShs)
Social housing(2rooms)	25	600,000
1-bedroom	30	1,000,000
2-bedrooms	40	2,000,000
3 bedrooms	60	3,000,000

AHP projects were primarily pre-determined in terms of area, number of rooms and cost, as shown in the table. Typolgies developed for any AHP site would therefore be required to fit within the set parameters, thereby cushioning potential buyers from price escalations that would otherwise vary from site to site.

Fig 2.12 AHP Housing typologies (Source AHP 2017)

To ensure accessibility of the AHP projects, the GoK provided avenues such as Tenant Purchase Schemes(TPS), mortgages for civil servants by the Kenya Mortgage Refinance Company established under the Ministry of Housing, the use of Boma Yangu portal for equitable distribution of developed houses, use of huduma centre outlets for registration of potential buyers and use of media outlets to create awareness on the availability of houses.



To ensure that AHP projects observed sustainable environmental and physical infrastructural allocations, a guideline was set to ensure an optimum balance of open space, utilities, roads and services, community facilities and residential built-up space. To ensure sustainable social considerations, the AHP framework allowed for diverse typologies to enable participants to choose typology and location in consideration of household sizes and preferences, allowed for public participation, and provision of safeguards which consider the needs of vulnerable groups.

Fig 2.13 AHP Space allocation guideline (Source AHP 2017)

Key design principles for AHP projects include considerations for open spaces such as sports facilities/playgrounds, communal spaces and pocket parks; vehicular, pedestrian and cyclist paths;safety installations such as perimeter walls and access control systems; enabling thriving communities through provision of social infrastructure such as community halls, schools and health facilities, and enabling affordable and innovative building technologies .

Fig 2.14 AHP key design principles guideline (Source AHP 2017)

2.7 Legal, Institutional and Policy Frameworks

2.7.1 Legal framework

a) The Constitution of Kenya, 2010

The Constitution of Kenya (2010) entitles all citizens to a clean and healthy environment. The right to have the environment protected is also enshrined in the constitution for the benefit of present and future generations. Article 43 section 1b gives every person the right to access adequate housing, and to reasonable standards of sanitation. It is this constitutional requirement that obligates the government to be a player in provision of housing, hence the various interventions that have been put in place post promulgation of the constitution post 2010.

b) The County Government Act, 2012

This is an act of Parliament that empowers county governments' powers, functions and responsibilities to deliver services and for connected purposes laws that will guide planning in the devolved system. The act provides for the establishment of a county planning unit which will be responsible for: coordinating integrated development planning within the county; ensuring integrated planning within the county; ensuring linkages between county plans and the national planning framework; ensuring meaningful engagement of citizens in the planning process;

ensuring the collection, collation, storage and updating of data and information suitable for the planning process; and ensuring the establishment of a GIS based database system. The act also provides for the preparation of; county integrated development plans, county sectoral plans, county spatial plans and cities and urban areas plans as provided for under the Urban Areas and Cities Act. This has been the driving force behind the involvement of counties in housing as discussed in the earlier sections of this report.

c)Urban Areas and Cities Act, 2011

This act of parliament provides for the classification, governance and management of urban areas and cities to provide for the criteria of establishing urban areas and also lays emphasis on integrated development plans and strategies of county governments. Housing is captured under this act as part of the development agenda for each county.

d)The Physical Planning Act 1997 (cap 208)

Majorly concerned with the preparation and implementation of physical development plans and other related functions. It defines development control measures that ought to be taken in order to ensure plans are complied with. In Nairobi's inner city areas, policy and legislative interventions are urgently required with respect to land use intensities and density of development. The act also empowers the County Government of Nairobi to ensure controlled and organized development, that is, to regulate zoning, to control and prohibit subdivisions of the land into small and uneconomic plots.

e) Environmental Management and Coordination Act (No. 8 of 1999)

The role of EMCA is to ensure promotion of a safe, clean and healthy environment. The act provides for the establishment of environmental controls to ensure execution of the requirements given in the act for guidance on matters such as erection, reconstruction, placement, alteration, extension, renewal, or demolition of any structure, of any structure or part of it on land.
Environmental and social impact assessments (EIA) are critical informants of the sustainability of mass housing developments.

2.7.2 Institutional framework

a) Physical Planning Department

In Nairobi, the department has prepared the Nairobi Integrated Urban Development Master Plan (NIUPLAN), that has made it possible for the city to reorder the urban structure, including the rezoning of inner city areas such as Ngara to allow for densification.

b) The State Department for Housing and Urban Development (SDHUD)

The State Department is responsible for providing policy direction and coordination of all matters related to housing and urban planning and development. Under it are various departments that oversee diverse functions. The Housing department is responsible for overseeing public housing projects in terms of planning and implementation. The Civil Servants Housing Scheme is responsible for giving mortgages to civil servants at competitive interest rates of 5%(as of 2023) to enable them build or purchase housing units. The Estates Department is in charge of managing houses and state lodges. The Public office accommodation department is in charge of leasing spaces for all government departments while the Rent restriction tribunal is tasked with resolution of landlord-tenant disputes.

c) The National Housing Corporation (NHC)

The primary role of NHC is to lead the implementation of the Government's Housing Policies and Programmes. In the case of the affordable housing programme, NHC is the principal government-implementing agency and has played a leading role in this endeavor through direct construction of dwellings; by adopting innovative project management and facility management methods that reduce construction time and guarantee quality. One of the strategies was to facilitate AHP through supply of factory engineered panels manufactured by the Corporation's EPS factory with the aim of significantly reducing construction time and costs.

d) **NEMA**

The primary role is to ensure protection of the environment through coordination of environmental activities being carried out by determining their impacts in the quality and quantity of natural resources, carry out surveys which will assist in the proper management and conservation of environment of the implementation of the relevant international conventions, treaties and agreements to which Kenya should be part of.

2.8 Conceptual framework

This framework is based on the analysis of housing in inner city areas. The most utilized urban transformation approach is urban redevelopment with the aim of developing housing that is considered adequate in terms of quality and quantity. GoK in its development of the AHP framework did come up with strategies whose effectiveness will be tested using the case of the affordable housing estate at Park Road,Ngara. The framework will be used to guide on indicators to be tested so as to ascertain the effectiveness of the strategies deployed by GoK.

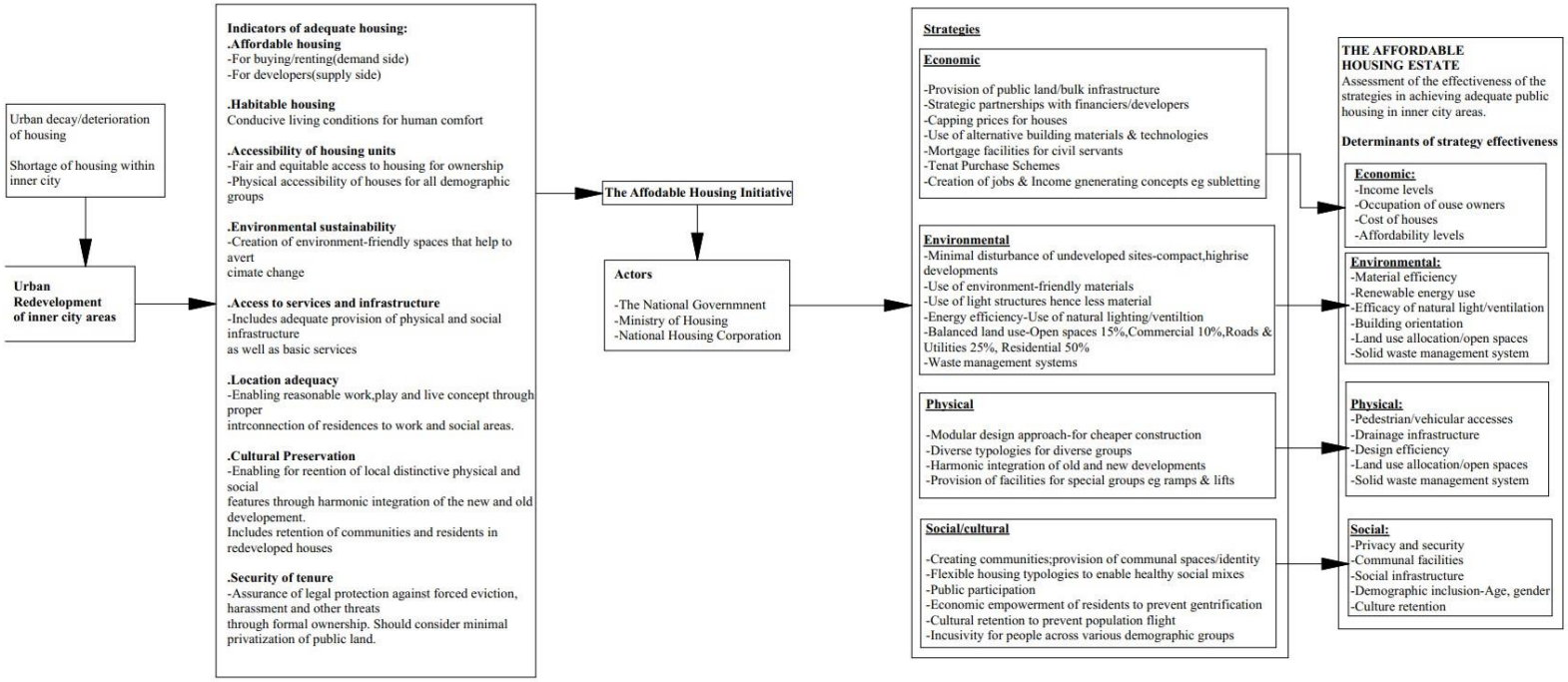


Fig 2.15:The conceptual framework;Source:Author

2.9 Case Study: Public Housing in Singapore

Singapore's successful public housing has been hailed as one of the best globally and worthy emulating. The city-state of Singapore is widely known for its success in providing housing for over 80% of the residential population, with most owning homes. Economic, socio-cultural and environmental considerations have effectively been put in place, to ensure provision of adequate and affordable housing. The following subsections will look into the history and the present situation of Singapore's housing, having risen from the claws of a less developed country ridden with challenges typical of LDCs to a developed country with policies that can serve as role models to other countries, particularly in housing.

a) The history of Singapore's housing

Before she gained her independence, Singapore was dealing had a major challenge in her urban areas due to overcrowding with most residents of the island city-state nation living in informal settlements and slums and were often consumed by malady. Overpopulated and stacked in particular areas, residents suffered unsanitary and unclean environments. At independence, Singapore's leaders set up a housing system to help form the foundation of an independent Singapore's social structure and culture through establishment of the Housing and Development Board (HDB) as the national housing authority in 1960. The main was to solve the nation's housing crisis at the time, and to push for home ownership. The end goal was to foster a stronger sense of the Singaporean identity. HDB focused on provision of low cost public housing. (HDB, s.d.). Singapore's public housing policy is globally renowned for its successful provision of housing, having been able to house over 80% of its residential population and with most of them owning homes. Statistics from the HDB indicate that over 1 million units have been built, providing housing for more than 80% of the population of which about 90% of these people own the houses. By 1980s HDB's focus had shifted to include middle income households. Today, Singapore is able to provide accommodations for over 80 percent of the residential population, with more than 90 percent owning homes. Singapore's housing policies have been hailed internationally as being phenomenally successful due to their ability to provide very high rates of home ownership. The HDB has had a positive impact on Singapore's public housing by using innovative, sustainable, and effective management that provides not only quantity but also quality housing. Since achieving its main goal of providing shelter for Singapore's increasing population, the HDB has become more concerned with the type and quality of the housing it offers. The following sub-sections look into the various areas of

articulation of public housing in Singapore. Critical lessons can be learnt from Singapore's experience, and if well If implemented economic, social and environmental milestones will have been achieved.

b) Social considerations

The population of Singapore is diverse, as a result of considerable past immigration. As per a census conducted in 2021, Chinese predominate at 75.9%, Malays are the next largest ethnic group at 15.1%, Indians the third at 7.4% and others at 1.6%. The pattern, in terms of population has always held as such. Before 1960, different ethnic groups were concentrated in different areas of Singapore, forming enclaves. However, since 1960s, the Singapore government has used public housing as an instrument to integrate the spatial population.

Initially, Singapore was described as a modern metropolis that bore international style and homogeneous in space. HDB's efforts resulted in the mass production of homogeneous spaces that lacked any sense of place. Even then, Singapore's housing enjoyed greater home ownership and was able to encourage ethnic integration (Teo and Huang,2015). Attempts were later made to create a sense of place, implemented at neighborhood levels whilst ensuring inclusivity of the diverse ethnic groups co-existing. It is highly likely that the housing system of Singapore is the reason behind remarkable social harmony, inclusivity and cohesion among the diverse range of citizens of this tiny nation. Whereas previously different races lived in segregated communities, the social morphology has changed and now they all live within the same areas and lifestyles, causing them to create sustainable communities that transcend beyond their races, ssvalues and traditions.

Teo and Huang(2015) study of one of the neighborhoods in Singapore known as Pasir Ris, they found that the project was successful in its attempt to create a sense of place and identity and also encouraged a strong sense of bonding and belonging among residents. This has been achieved through physical elements such as shared courtyards, walkways and pavilions, all designed to encourage frequent interactions among neighbours. Whereas previous designs have represented the humble modernist style that was typical of the industrialized production of buildings, while also contributing to the standardized appearance of public housing in Singapore. To foster a sense of distinctive belonging, buildings in different estates have distinctive facades decorated with motifs, dormers, and colors thus creating uniqueness that residents can identify with(Teo and Huang, 2015). Citizen participation has also been a critical strategy in bid to increase residents' involvement in upgrading schemes. This allows for residents to make suggestions about estate improvements.

b) Physical and environmental considerations

Singapore's public housing has over many decades shifted from production of homogeneous spaces to heterogeneous spaces. Focus has shifted from quantitative to qualitative housing thereby prompting interest in studying residents' living experiences with a focus on the subject of livability (Teo and Huang, 2015). Current upcoming neighborhoods are made up of a vibrant mix of various unit sizes typologies, with distinguishable character (Teo and Huang, 2015). Teo and Huang further observe that this mix of unit sizes in turn encourages healthy social mixes of people with diverse family sizes and economic groups. The HDB has also interestingly fixed quotas of flats to be sold or rented out to people from the most diverse cultures and origins in a bid to prevent dominance of any single ethnicity in any one neighbourhood. People from Chinese, Indian and Malay ethnicities, all have a fixed percentage of apartments they can occupy (Teo and Huang, 2015). Singapore has since year 2000 incorporated new technologies and eco-friendly considerations in public housing estates all with the aim to provide well-connected, unique and sustainable housing estates.

c) Economic considerations

Although Singapore is known for its capitalism and cultural diversity, public housing in Singapore is subsidized, built and managed by the government. Singapore achieves housing affordability through differentiated citizenship rights and restricted foreign ownership and aims to offer every citizen a home. The vast majority of citizens are able to choose from decent to stylish government-built apartments in well planned communities. Countries around the world have praised the model. The vision has always been to have everyone who is a (citizen) would be a homeowner, buying housing from the government, which is the principal landowner, or from a much diminished private sector. As a result, 90% of Singapore citizens own a dwelling (Ley, 2018), majority of them being apartments ranging from basic to high-end. Most are leased for 99 years from the government. The HDB also provides public housing for rental, which consists of smaller units, such as one- and two-room flats, and is mainly provided for lower-income households and households waiting for their purchased flats.

CHAPTER III: RESEARCH METHODOLOGY

3.1 Introduction

Research primarily aims at identification of knowledge gaps and verification of what is already known. It may also aim at identification of past errors and limitations (Kumar,2005). This chapter outlines the methods used to conduct the research in this dissertation. The chapter contains the following: The research design in section 1, elaboration of data collection methods in section II, data analysis in section III, conceptual framework for analysis in section IV and lastly analysis of validity and reliability in section V.

This study has used quantitative and qualitative methodological approaches to investigate the effectiveness of housing strategies deployed by the government in the case of the affordable housing estate, Ngara. In this section, a detailed description of the methodology to be utilized throughout the study in the form of the data sources, types, needs, data collection methods, field survey instruments, data analysis and presentation techniques are all laid out.

3.2 Research Questions

The focus of this study is centered around these three questions:

a) What strategies have been deployed by the government in the (re)development of housing within inner city areas?

b) How effective are the strategies deployed by the government in meeting the needs of housing in inner city areas?

c) What strategies can be adopted for public housing projects going forward?

3.3 Research Design

It is a case study design that employs both quantitative and qualitative methodological approaches. This research particularly utilizes a case study research methodology in order to address the research objectives. This provides context dependent knowledge (Golofshani,2003), and through the use of multiple data sources different viewpoints are recorded (Tellis,1997).

The interest in this case is to understand the strategies that have been deployed by the government towards the urban development of the affordable housing estate within Ngara and the outcomes in consideration of physical, economic, environmental and social contexts.

Data and information with respect to residents of the estate and the State Department of Housing and Urban Development (SDHUD) as well as the National Housing Corporation(NHC) form the basis of this study's analysis.

Data collection methods used in the study include open ended interviews, structured questionnaires, observation and secondary dataThe following are components of the research design adopted for this study:

a) **Construction of Study Questions:** Will involve interrogating strategies that have been deployed by the government towards the affordable housing estate in Ngara, and their effectiveness in meeting the needs of housing therein.

b) **Study propositions:** This will entail proposals of strategies that will benefit urban redevelopment projects for inner city housing.

c) **Units of analysis:** The unit of analysis for this study is the affordable housing estate at Park Road Ngara, whose qualities will be tested for effectiveness of strategies utilized.

3.4 Sampling techniques and tools

The study has applied random sampling, specifically the simple random sampling technique in which the researcher randomly selects a subset of participants from a population (Mugenda and Mugenda, 2003). They further explain that in this type of probability sampling, every member of the population has an equal chance of being selected.

The subjects targeted for the study include;

- The area residents (tenants, sub-tenants, owner-occupiers) living in the old bungalows, old public houses and those living in the newly constructed high-rise apartments.
- Community leaders,

- Policy makers (SDHUD, NHC and CSHSF) because of the experience they have had while carrying out and managing redevelopment programs in Nairobi's inner city hence deemed as informative, reliable sources of information for this research. The officers interviewed will be directly picked based on their expertise in the topic of study.

3.4.1 Sample procedure

The sample size constitutes residents of the affordable housing estate, at Park Road Ngara, who will be randomly picked and from whom data regarding physical, environmental, socio-cultural and economic aspects will be collected.

3.5 Research Procedure/Data Collection

This study will use both primary and secondary data sources to generate quantitative and qualitative data.

a) Secondary Data

This data type will be obtained through a review of existing literature such as found in relevant journals, internet sources, government publications, articles, maps and other sources relevant to public housing within inner city areas. This will aid in the understanding of the area of study and establishing what has been previously been uncovered by others in the same area of study.

b) Primary data

This will form the main source of data that will inform the study and will be made up of data straight from the field and from those in contact with the study area and will form the main criteria of assessing the effectiveness of government strategies in inner city housing. The methods that will be used to collect primary data include:

Questionnaires

Will consist of structured closed and open ended questions, and will be presented to residents'/ respondents and responded to in written form.

Interview Schedules

These will be prepared for government agencies involved in public housing within Ngara estate. These will include NHC, SDHUD

and CSHSF.

Observation

This will involve a systematic observation and recording of features, characteristics, trends and visible manifestations of

Features and elements within the affordable housing estate. A checklist will be used to as a tool to aid in the observation. Key aspects that will be observed will include the physical aspects, land use aspects, economic aspects as well as social aspects, for analysis.

Mapping and Photography

Maps will be used to assess the distribution of land uses within Ngara estate. Photographs will be taken and used to facilitate the analysis of the situation of general housing and other amenities within the affordable housing estate, Ngara.

Focus Group Discussion

Groups of residents comprising of community leaders and residents from the various projects will be brought together and informative discussions revolving around prevalent conditions of the public housing estates will be discussed.

3.6 Data Analysis and Presentation Method

Once collected, data will need to be synthesized in order to make meaning and answer research questions adequately through a data analysis process. Data collected from the structured questionnaire will be entered, coded, cleaned and analyzed using the Statistical Package for Social Sciences(SPSS) and the outcome of both qualitative and quantitative data collected will be presented using simple frequency distribution and analytical tables. Maps, sketches, plans, illustrations and photographs will be used to present the data, which will also have been discussed in descriptive analysis.

Finally, findings will be interpreted and synthesized to facilitate the writing and composition of this research report; and presented in an integrated planning research report.

3.7 Data Needs Matrix

	RESEARCH OBJECTIVE	DATA NEEDS	DATA SOURCE	DATA COLLECTION TOOL	DATA ANALYSIS METHOD	DATA PRESENTATION METHOD
1	To assess strategies that have been deployed by the government in the urban redevelopment of	-Social, economic and environmental strategies deployed	Literature Review	Desktop review of secondary data		
	Nairobi's inner city areas		Interviews: -SDHUD -NHC -CSHSF	Interview Schedule		
			-Observation			

2	To examine the effectiveness of the strategies applied by the government in housing projects within inner city areas such as Ngara	**.Social indicators** -Inclusivity -Cultural preservation -Mobility of housing **Economic indicators** -Affordability -Meeting targets of housing supply -Job creation -Security of tenure **Physical/Environmental indicators**	Interviews: -SDHUD -NHC -CSHSF -Residents -Observation	Interview Schedule -Questionnaires	SPSS MS EXCEL Spatial Analysis by use of GIS	Charts Maps Sketches Bar graphs Tables Photographs Written report
		-Energy efficiency -Habitability -Location adequacy -Access to infrastructure and services				

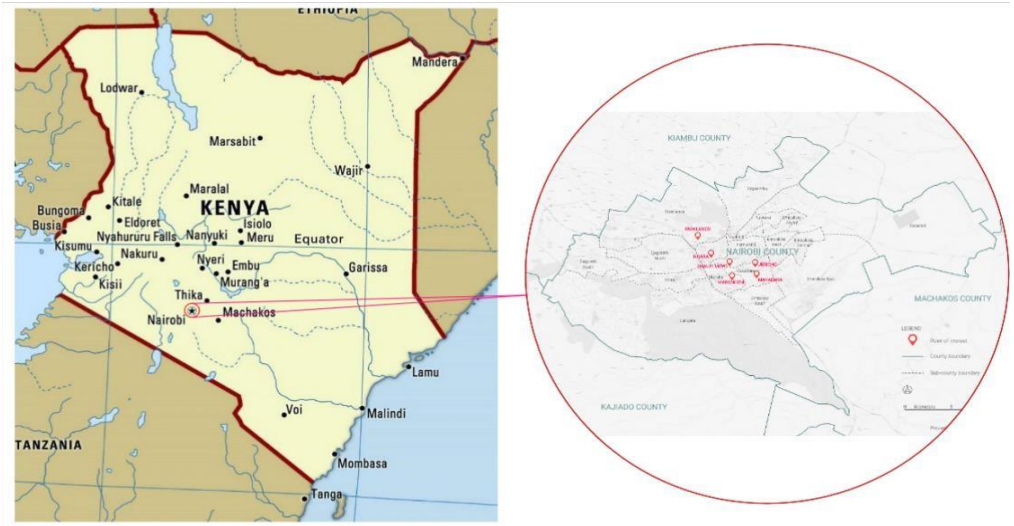
3	To propose strategies that could bear the greatest benefit to all stakeholders involved in urban redevelopment within inner city areas.		Research findings	Recommendations		

CHAPTER IV: THE STUDY AREA

4.1 Introduction

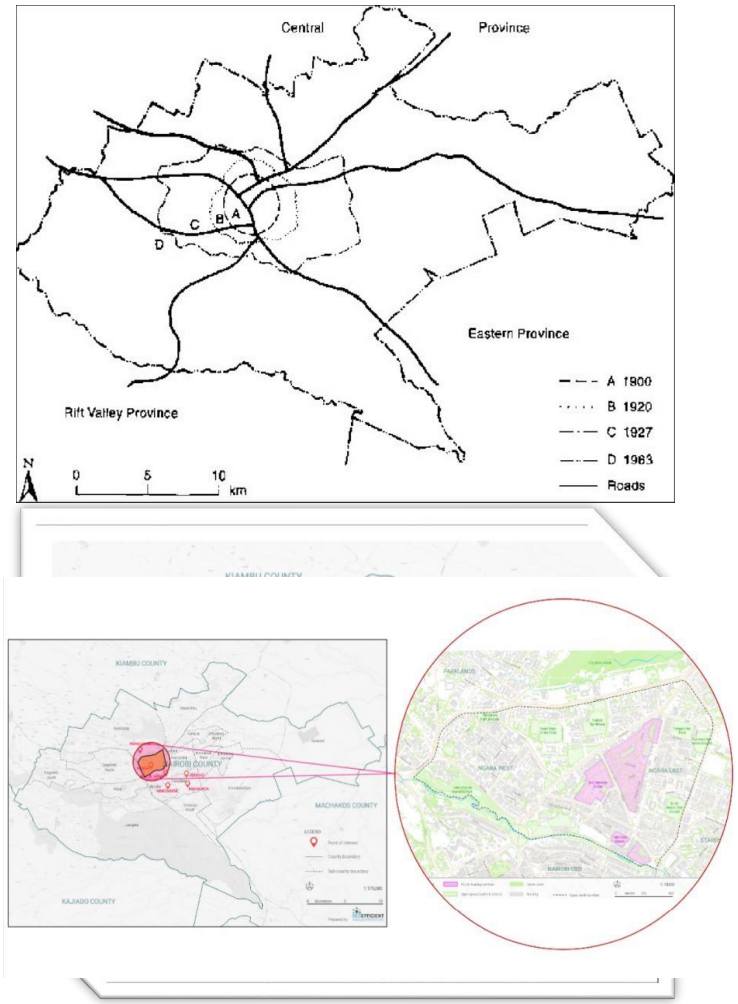
This chapter discusses housing strategies in the context of the affordable housing estate, Park Road Ngara by considering in detail the policy strategies that the government has deployed in its development of the housing estate as well as the contextual neighbourhood. It also looks into the affordable housing initiative in detail and the strategies that have impacted the being of the estate. The chapter further considers the trends of housing from pre-independence times to the present within Ngara and also within Nairobi, which forms the context of the study area. The chapter borrows from literature review and data collected from the relevant government agencies. It would be impossible to study Ngara's history, present and future without engaging in an in-depth study of Nairobi city. This is because Ngara, being at the heart of the city due to its proximity to the CBD is directly impacted by any growth and changes that the city experiences.

4.2 Nairobi



Nairobi is not only the capital city of Kenya but also an important economic and social hub that serves as a model for the continent of Africa (Makachia,2008). It plays home to half of the total formal employment opportunities in Kenya and generates more than half of the country's gross domestic product (GDP). In terms of population, the KNBS 2019 census put the current population at 4million people day population and with a rate of growth that exceeded that of the country at 3;9% for the period between 2009-2019.

Map 1:Kenya and Nairobi maps; adopted by author



In summary, the genesis of Nairobi is attributed to the decision made by the colonial administration's in charge of Uganda Railways Committee to construct a railway linking the Indian ocean to the East African hinterland in 1895. They identified a location which was by then used by the pastrolist Maasai,the Ogiek and the Kikuyu to water their cattle as the ideal environmental location for their headquarter (Hake,1977). This place, referred to as the place of cool waters, is present day Nairobi. The other reason why Nairobi was selected as a rail depot of the Uganda-Kenya Railway from 1899, its subsequent growth as an urban settlement and a center for the colony's coffee, tea and sisal industry and later chosen as the capital of Kenya in lieu of Mombasa in 1907 was its centrality in relation to the construction of the railway (Burton,2002).

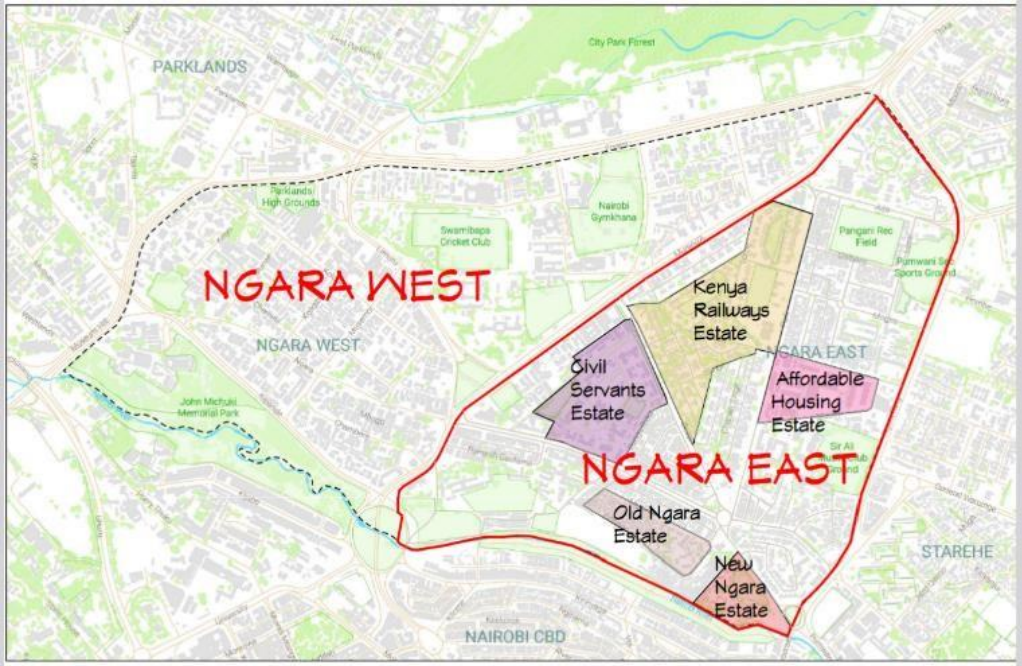
4.3 Ngara

Ngara estate is located approximately 1.7 kilometres North-East of Nairobi's CBD. It is a dynamic V-shaped formation that is predominantly a residential and commercial hub. Bound by Ring Road Ngara to the east, Forest Road to the north, Kipande Road to the south west and the Nairobi River to the south. Administratively Ngara area falls within the Nairobi central area and falls within Nairobi's Starehe Sub-county and neighbours other inner city estates including Pangani, Kariakor, and the CBD.

Map 2:Maps of Nairobi and Ngara Souce:Adopted by author

It is distinctly divided into two sub-locations namely Ngara East and Ngara West. Ngara's night population, according to 2019 census results, totals to 25,354 people with Ngara East having 15,583 people with 5,067 households living in an area of 1.37 sq. km and Ngara West having 9,771

with 2,682 households living in an area of 1.28 sq. km (KNBS,2019). Daytime population is higher due to the high number of non-residents who work within Ngara but live elsewhere.



To deal with challenges often associated with inner city areas, the preferred approach, just like in many other inner city areas globally, has been urban redevelopment. The Government in particular has redeveloped parcels belonging to the Kenya Railways Retirement Benefits Scheme(KRSBS) and the Civil Servants Housing Scheme Fund(CSHSF)within the estate by way of demolishing low-rise structures and replacing them with high density multi-storey blocks that hold more housing units. Some of the government owned projects are marked on Map 4.3 include the Civil Servants Estate, Redevelopment for more of government owned sites is at planning stages, such as in the case of Old and New Ngara.

Map 3:Map of Ngara(Source:Author)

Ngara is considered one of the oldest neighbourhoods in Nairobi and dates back to the early 20th century when Ngara and the southern parts of Parklands were the formal settlements for the Asian community. During colonial times, it was predominantly inhabited by residents of Indian origin(Karanja,2008). The area has changed over the years and has gradually become ethnically diversified, inhabited by residents of African, Somali and Asian descent. Currently dominated with affordable housing for the low-middle and low income earners including student hostels. Spatially, the area has transformed into a high-density suburb as evidenced by high-rise apartment blocks including thase that have been developed od proposed to be developed by the government. The population of residents of Asian descent has notably diminished, especially within Ngara East. Government owns substantial parcels of land within Ngara, particularly in Ngara East. It is home to a number of public housing projects;

including 34-floor high River estate. Spatially, the area has transformed into a high-density suburb as evidenced by high-rise apartment blocks including these that have been developed or proposed to be developed by the government

The glamour that was once exhibited by the architectural grandiose of the old Asian type houses occupied by young Asian families is gone and in its place, lies domination of densified, high-rise, affordable housing for the low-middle and low income earners including student hostels, all thanks to urban redevelopment initiatives driven mostly by public institutions. According to a report on the economic landscape of Ngara today, Hass Consult (2018) Ngara postulates that Ngara is less appealing to investors when compared with Westlands and Upperhilll which are also close to the CBD. Part of the reason for this is the informality that has become part of Ngara's existence as evidenced by numerous business establishments by the sides of its major circulation spines.

4.3.2 Land uses in Ngara

Ngara is zoned for mixed development of various land uses for as long as they are compatible (Khaoya,2008). These include commercial, residential, light industrial, recreation, health and educational land uses. Khaoya(2008) further avers that any new development is required to get an environmental and social impact assessment done, to ascertain that not only is the proposed land use compatible to existing ones but also that it bears no substantial impact to the environment.

4.3.2.1 Residential Use

Fig 4.1 CSE and AHE photos (Source:Author)

It is the dominant land use in Ngara. It is a land use that is undergoing major transformation within Ngara, both for public and privately owned residential establishments, with buildings within the estate being of different typologies and at different states. Recent rezoning has seen the transformation of residential buildings within Ngara. Notable among these are the affordable housing project going upto 13 floors high on some blocks and the river estate owned by a private developer (Erdemann properties Ltd) going up 34 floors high on all its eight blocks. There is also significant presence of low density bungalow units owned by the Kenya Railways Staff Retirement Benefits Scheme. Indian typology units are also present in some sections, often sandwiched between redeveloped plots. *Fig*

4.3.2.2 Commercial Use

There is a concentration of commercial enterprises along major circulation spines including Ngara Road, Desai Road,Park Road and Murang'a Roads. These include office spaces, retail outlets, eateries, bars and hotels (lodgings, restaurants and cafes) and student hostels. Desai Road and Park Road which are in close proximity to housing redevelopment projects have fairly formal business kiosks put up by the county government of Nairobi alongside refurbished bus parks. Ngara area is famous for car garages. This is evidenced by their presence along Ngara road and Desai Road. However, due to the redevelopment around Desai Road, many of the garages are tucked inside the plots owned by KRSRBS and facing the main road.

Fig 4.2 Photos of commercial activities along major roads in Ngara (Source:Author)

The mushrooming of temporary and informal structures mostly used by small scale traders signifies the need and lack of proper provision of market spaces and alludes to poor management of existing ones such as the Ngara hawkers market.

4.3.2.3 Education facilities

Ngara is endowed with a number of public and private primary, secondary and tertiary schools. These include Ngara Girls Secondary School, Arya Girls Secondary School, River Bank Primary School, Murang'a Road Primary School, City Primary School, Nairobi River Primary School and Arya Primary School.The Colleges in Ngara neighborhood include Nairobi Technical Training Institute, Vision institute of Professional Studies and Pioneer international College. Educational facilities like the University of Nairobi and Kenya Polytechnic University College can be easily accessed. A part from the above there are; numerous campuses for public universities; and private colleges in the CBD which can easily be accessed from Ngara.

4.3.2.4 Health facilities

Ngara is endowed with several public and private health facilities including Guru Nanak, the Nairobi county health center, Ngara medical complex etc. However, with the influx in the resident population courtesy of redevelopment, there is need to increase the number of such facilities. The author noted during her study that this has been left in the hands of the private sector as it was observed that there were two private health facilities coming up in the vicinity of the affordable housing estate.

Fig 4.3: Images of health facilities within Ngara(Source;Author)

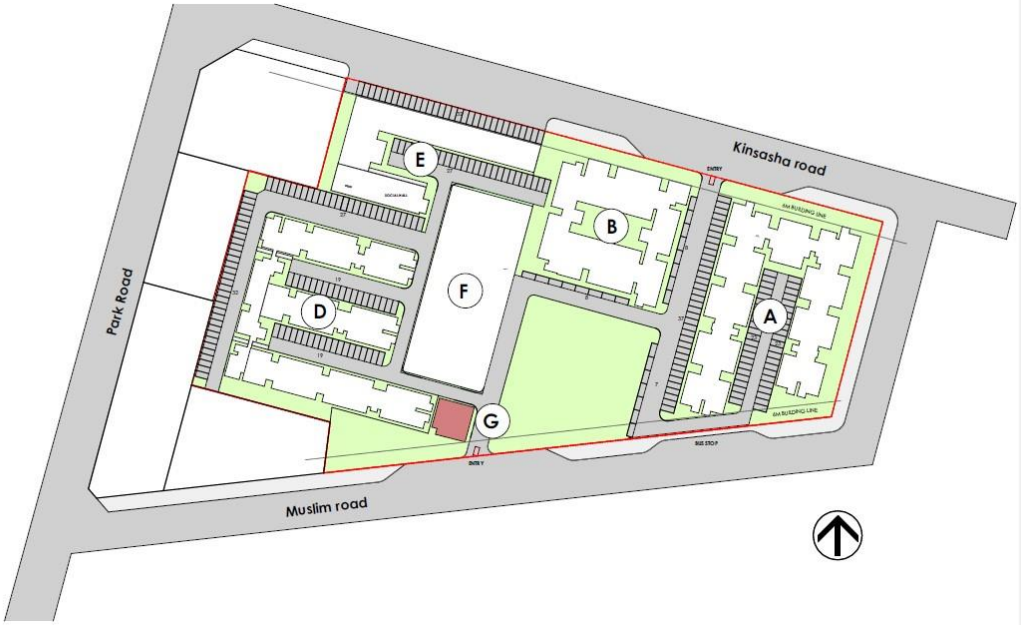
4.3.2.5 Streets

There is considerable effort to introduce paved pedestrian walkways along the relatively recently refurbished roads such as Desai Road and Park Road. The streets have been made pedestrian friendly through the introduction of street furniture, street lights and sizeable walkways. The placement of infrastructure for services such as electric poles seems to not have been well though out however as they can be observed haphazardly placed along walkways. Also, it was observed that there is inadequate storm water drainage provision, which compromises the sustainability of the roads and streets.

Fig 4.4: Images of health facilities within Ngara (Source:Author)

4.4 The Affordable Housing Estate

The affordable housing estate in Ngara is located between Park Road, Muslim Road and Kinshasa Road. It was borne out of the affordable housing initiative by the GoK (2017-2022) under the Big Four Action Plan alongside universal health coverage, enhancing manufacturing, and food security. The affordable housing initiative, as discussed in chapter II of this study is premised on article 43(1b) of the Kenyan constitution that guarantees every citizen the right to accessible and adequate housing and a reasonable standard of sanitation. The main aim was to ensure that people of low and lower middle income brackets who are unable to own decent homes due to the prohibitive land and construction costs and stringent financing requirements. are able to access affordable, decent housing.



Block Type	No.of floors	Unit typology	Unit Size(sqm)
A	G+5	2BR	60
B	G+12	3BR	60
D	G+13	3BR	60/80
E	G+13	1,2BR+COMM	30/40
F		Parking silo	
G		Kindergaten	

Fig 4.5 : Site plan of the AHE estate Ngara (Source:SDHUD)

Fig 4.6 : Project brief of the AHE estate Ngara (Source:Author)

Park Road is the first of many housing projects scheduled for implementation by the government under the Affordable Housing Programme. The site where the project consisting of 1,370 units stands today measures 7.9 acres and previously contained fourty-eight standalone bungalows built during the colonial days. The project has a construction area of 123,000 square meters and covers an area of about 32,000 square meters. The estate consists of one, two and three-bedroom housing units, 1:1 parking provision including in a parking silo provided and other social and physical amenities and infrastructure. The physical infrastructure includes a nursery school, mixed use developments, access roads, sewer, water and power supply. GoK undertook to upgrade the social and physical infrastructure in the neighborhood to accommodate the proposed development. The typologies and costings of the project were as follows:

No	TYPOLOGY	SIZE(Sqm)	Intended Selling Price	Actual Selling Price
1	I bedroom unit	30	1,000,000	1,500,000
2	2 bedroom unit type 1	40	2,000,000	2,000,000

3	2 bedroom unit type 2	60		3,000,000
4	3 bedroom unit type 1	60	3,000,000	3,550,000
5	3 bedroom unit type 2	80		4,000,000

Table 1:Typology and cost breakdown for AHE houses (Source:Author)

The project finance strategy was public-private partnership(PPP) between the government of Kenya and China State Construction and Engineering Corporation who were also the contractors for the project. The proposal by GoK to create a revolving fund comprising a mandatory 1.5% levy on salaried persons to finance the housing project under the housing levy Act encountered legal hurdles after its implementation was suspended by Kenya's High Court in 2019. Among reasons why it was suspended was a lack of stakeholder involvement at its planning phase.

4.5 General Characteristics:

4.5.1 Physical aspects

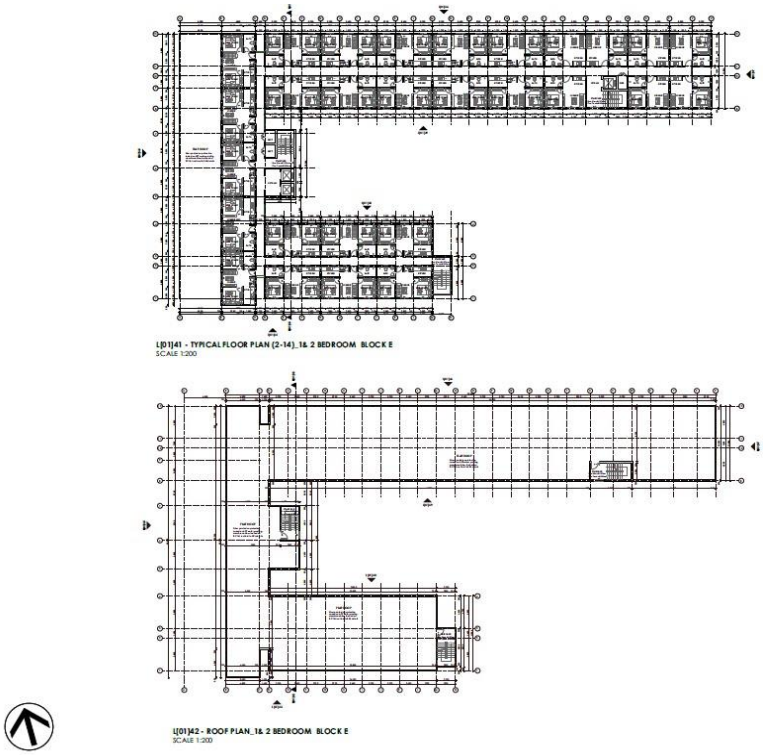
All blocks are fitted with lifts, in line with regulatory requirements for all buildings that are more than 4 storeys high. The building materials used are generally masonry for wall infills and hollow blocks for slabs, which in addition to lighter structures, is cheaper and more environmentally friendly. Use of glass, steel and concrete is substantial. Roofs for all blocks are flat, hence used for services such as hanging clothes. Designs are generally modular for every block, allowing for efficiency in construction. Driveways are paved with little vegetation to counter the expansive grey surfaces. There are storm water drainages along all main roads within the estate.

4.5.2 Environmental aspects

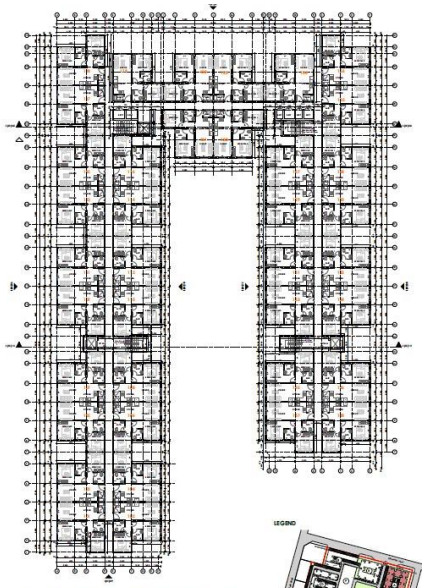
Blocks within the estate are generally oriented NE-SW. Plans for individual blocks are relatively deep plans generally presenting challenges in lighting and ventilation. Use of glass, steel and concrete and whose impact will be assessed in the findings chapter. The main energy source for buildings within the AHE is electricity and there is neither infrastructure nor installations for renewable energy sources. The buildings are generally not designed for disassembly. The proximity of the blocks to each other will be assessed to determine the net effect on the performance of the indoor spaces.

Social aspects

There is one community hall within the estate, located in block E, which also has retail/commercial spaces on its first and second floors. There are however no outdoor spaces to allow for interaction of residents for individual blocks.



LJD1)01 - GROUND FLOOR PLAN_2 BEDROOM (60SQM) BLOCK A
SCALE 1:200



LJD1)02 - TYPICAL FLOOR PLAN_2 BEDROOM (60SQM) BLOCK A
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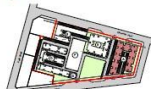
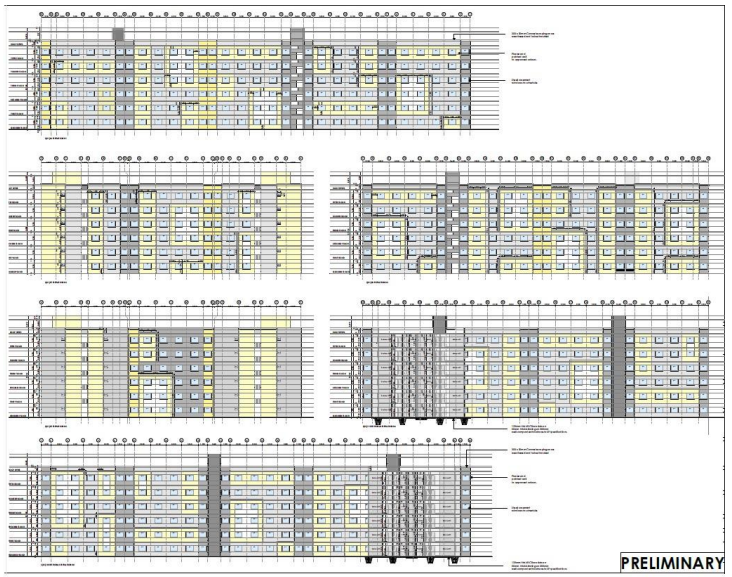
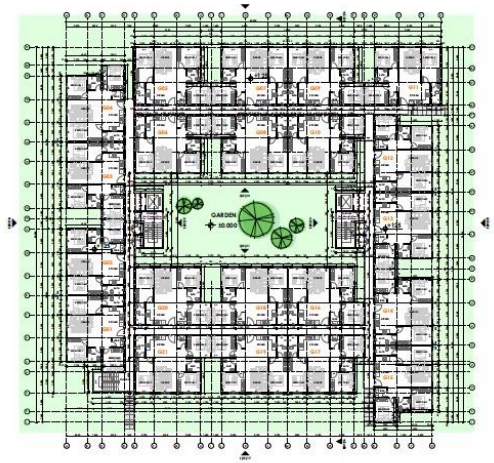
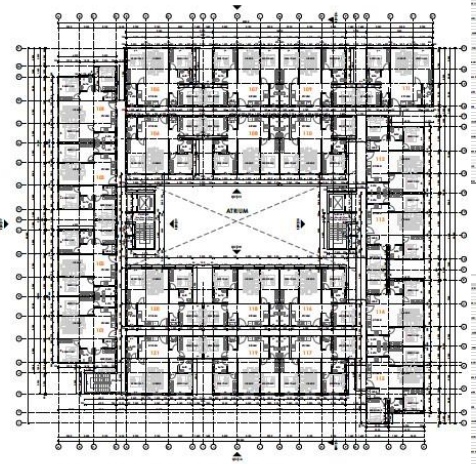






LJD1)13 - GROUND FLOOR PLAN_3 BEDROOM BLOCK B
SCALE 1:200



LJD1)14 - TYPICAL FLOOR PLAN (2-12)_3 BEDROOM BLOCK B
SCALE 1:200

4.4.2 Key Strategies for the Affordable Housing Estate

Include those geared towards economic, environmental and social aspects. Each of these ids considered in the sections below:

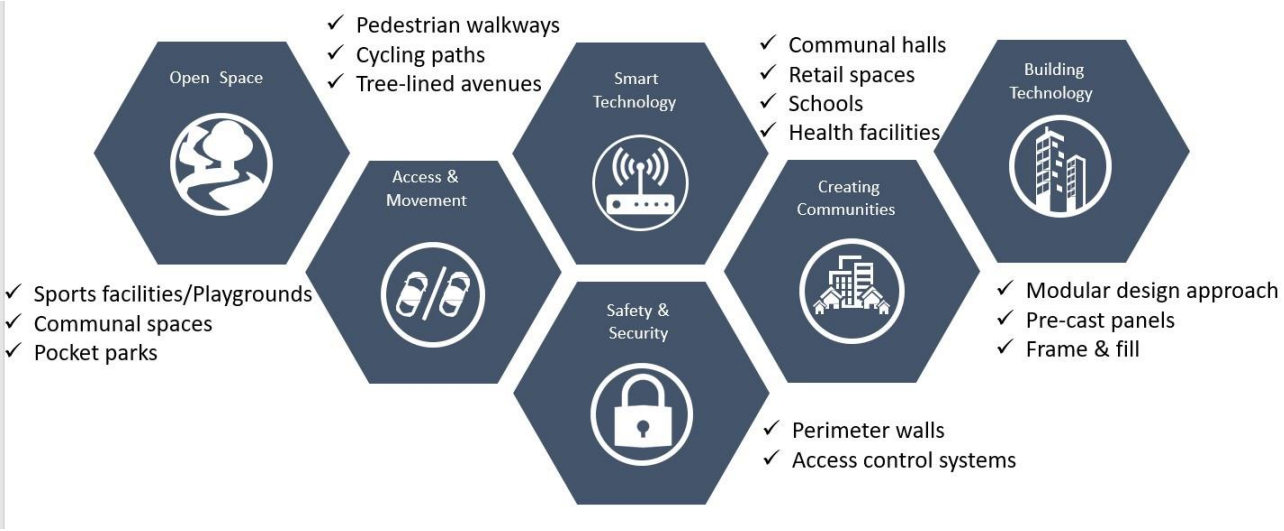
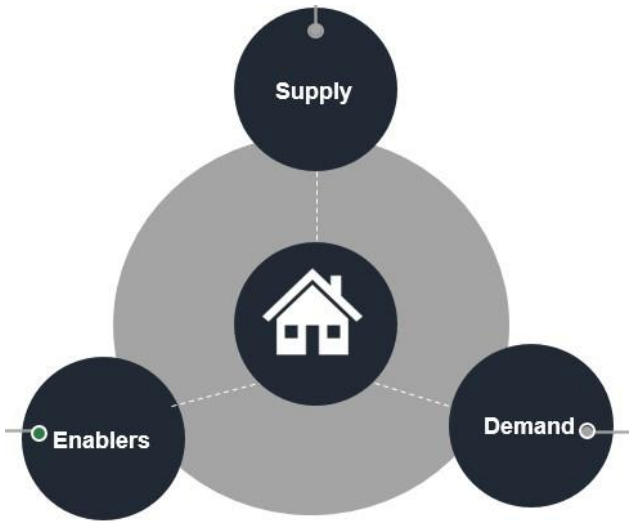


Fig 4.7: General key strategies for the AHE (Source:SDHUD)

4.4.2.1 Economic strategies

Realization of the project entailed the strategic partnership of various stakeholders. These included the national government, other state agencies, financiers and end users. The following sections look into the role of each stakeholder in the delivery of the project;



a)Key strategies under suppy(Role of Government)

1.Provision of land and bulk infrastructure

2.Infrastructure funding

3.Providing tax incentives

4.Allowing tax breaks-Zero-rating stamp duty for first time home owners

5.Overseeing standardization of designs, to make modular construction possible hence less construction cost, through NHC

6.Legal and policy review amendments

Fig 4.8: Key players in delivery of AHE (Source:SDHUD)

b) Key strategies under demand(Enablers Role)

1.Housing portal to assist in identification of the end user.

2.Provision of mortgages through the Kenya Mortgage Refinance Company(KMRC), under the State Department of Housing.

3. Availability of Tenant Purchase Schemes(TPS).

c) Allocation of units

One of the innovative strategies that were deployed in the project was formation of a housing portal, the Boma yangu, platform. It allowed for online allocation of homes via a web portal. Kenyans interested in the houses were required to register online giving personal details such as

employment status, household particulars and preferred area of residence and then the houses would be allocated by lottery. It also allows individuals to save towards home ownership.

4.4.2.2 Social strategies -

Accessibility to Kenyans has been considered across various aspects of the program from eligibility, registration, and even design principles. The following are the ways in which this was ensured:

Physical accessibility for vulnerable groups:

1.The project incorporated social safeguards which considered the needs of vulnerable groups. These included design principles to ensure accessibility for people with disabilities and the elderly.
2.Considerations for different types of households including single parent homes, child-headed households, etc.
3.Considerations on family sizes and culture have impacted design e.g. unit sizes, use of bedsitters for students only, etc.

Accessibility and Inclusivity for all

The project was intended to benefit all Kenyans and anyone above the age of 18 years was eligible for participation on the Boma Yangu. Registration was also facilitated through various options including Huduma Centers where Kenyans receive services from Government.

Project diversity

Beneficiaries were offered diverse choices in terms of the kind of home they would like to own based on the size of the unit.

4.4.2.3 Environmental strategies

The project included aspects of sustainable eco-design. Key strategies towards project environmental aspects included:

a)Open spaces

Included provisions for playgrounds, community gathering spaces, and sports facilities.

b) Access and Movement

Was planned to include pedestrian friendly walkways separated from vehicular accesses. Cyclist paths were also designed for within the estate.

c) Safety and Security

Features to ensure safety and security of residents included a perimeter wall, access control features and traffic management systems.

d)Smart Technology

Smart systems that were designed to be included in the project included gas reticulation systems, water systems and renewable energy systems.

e) Creating communities

This was planned to be achieved through creation of community facilities such as retail spaces within the estate as well as shared communal spaces.

f) Building Technology

Building technologies adopted were geared towards achieving lower construction costs, achieving shorter construction timelines and maintaining high quality construction. These included us of precast concrete panels and insitu formwork.

CHAPTER FIVE: RESEARCH FINDINGS

5.1 Introduction

In this chapter the researcher presents the findings of the study emanating from the analysis from where the results are interpreted to give meaning of the findings. The researcher then discusses the findings in relation to findings of the previous study. This is done in accordance with the objectives of the study. The researcher distributed the questionnaires to the respondents who are the residents of the AHP in Ngara. While the researcher used the simple random sampling to select the respondents, most of the respondents were unwilling to participate in the study despite the fact that the researcher introduced herself as a student and also produced the letters from the University and the Ministry. The researcher therefore resorted to use the management of the estate to assist in the distribution of the questionnaires just to gain their confidence. These too took long as very few were willing to participate in the study. However, the researcher managed to get 83 questionnaires completed to her satisfaction after intense persuasion and follow-up.

5.2 Respondents Biodata

In this section the researcher sough to present the respondents biodata such as age, occupation, gender, race, level of education, the size of the household and the average monthly income of the household. The results are presented in the subsequent sections.

5.2.1 Age Bracket

The study sought to determine the age distribution of the respondents. The results in Figure 5.1 show that 32(38.6%) are in the age bracket of 41years and 50 years. The results also show that 24(28.9%) were in the age bracket of 31 years and 40 years while 13(15.7%) were aged between 51 years and 60 years. The results of the study mean that the occupants of the houses were the 40s and 50s. The may be due to the general perception that this is the age when people become more financially stable and thus can afford to purchase a house, a view supported by Lutfi (2010) who stated that individuals of 29 years old and younger have a lower possibility of purchasing real estate as they would not be able to be financially stable.

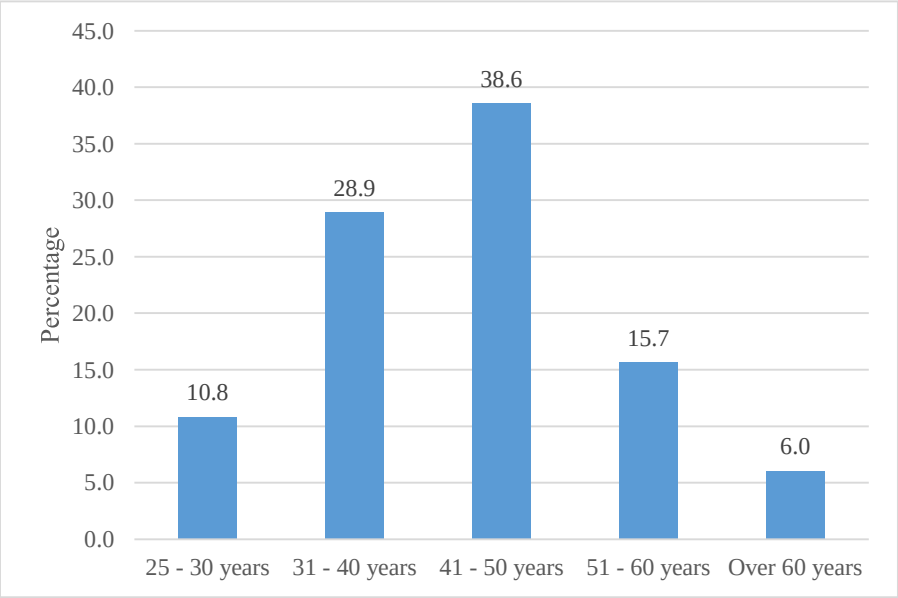


Fig 5.1: Distribution by Age

5.2.2 Distribution by Occupation

According to information gathered on the AHP, the program was intended to benefit all citizens that fall within the target group, and with civil servants allocated 400 out of the 1370 units. Legal hurdles to the housing levy that was targeted to raise funds to pay off loan led to challenges in settling GoK's financial obligation. The CSHSF stepped in and paid off the debt in exchange for 70% of the units. The result, as confirmed by the distribution of occupation of residents, thus mean that the biggest beneficiaries of the AHE were tcivil servants thus failure to meet the overall population as targeted.

Occupation	**Frequency**	**Percent**

Teacher	**3**	**3.6**
Doctor	**2**	**2.4**
Lawyer	**3**	**3.6**
Civil servant	**54**	**65**
Businessman	**21**	**25.4**
Total	**83**	**100.0**

Table 5.1: Distribution by Occupation

5.2.3 Distribution by Gender

The researcher sought to determine the distribution of the respondents by gender. The results in Table 5.1 show that most of the respondents (67, 81%) were men while the female were only 16(19%). The results men that men are more into real property than women which may be attributed to their financial masculinity over women. The results contradict the Section 27(3) of the Constitution 2010: women and men have the right to equitable treatment, including the right to equal opportunities in political, economic, cultural and social spheres.

	Frequency	**Percent**
Male	**67**	**81**
Female	**16**	**19**
Total	**83**	**100.0**

Table 5.2: Distribution by Gender

5.2.4 Distribution by Race

The researcher sought to determine the distribution of the respondents by race. According to the results in Figure 5.2, most of the respondents (46, 55.4%) were of native Kenyan origin while 37(44.6%) were of Somali origin. The results may be taken to mean that the race of the respondents might have influenced their occupation of the houses. These results agree with the views of Kahn (2015) who identified race as a socio-economic element which may influence the house purchase decision. They may also be an Indicator of population flight from the Ngara area.

	Frequency	**Percent**
Kenyan	**46**	**55.4**
Indian	**0**	**0.0**
Somali	**37**	**44.6**
Total	**83**	**100.0**

Table 5.3: Distribution by Races

5.2.5 Distribution by Level of Education

The researcher sought to establish the level of education of the respondents and therefore the respondents were asked to state their levels of education. The study findings in Table 5.3 show that 27(32.5%) respondents had secondary education while 34(41%) had college education. The results show that 18(21.7%) respondents had university education. The results mean that most of the respondents were educated. This study confirmed Hassan, Ahmed and Hashim (2021) assertions that higher education level is known as the primary factor of the housing system and as reported by Hurtubia et al (2010) that diverse academic degrees would contribute to various home categories being demanded and purchased. These findings are contrary to Zainon et al (2017) who doing a similar study found that the household with most representation was in the category of one to three people. This however contravenes the primary goal of the AHP, which is to provide social and affordable housing to all who fall within the low income group.

	Frequency	Percent
Secondary	**18**	**21.7**
College	**27**	**32.5**
University	**34**	**41.0**
Post university	**4**	**4.8**

Table 5.4: Distribution by Level of Education

5.2.6 Size of the Household

Respondents were asked to state the size of their households in terms of family members under their roofs. The results in Table 5.6 show that majority of the respondents (42, 50.6%) have households of between 6 to 10 members while 35(42.2%) have between 3 and 5 members. The results therefore mean that most of the respondents have families with at least one child. The distribution of the HH sizes also underpin the importance of having diverse typologies to cater for the needs of the different family sizes. **Table 5.6:**

	Frequency	Percent
Less than 3 members	**3**	**3.6**
3 - 5 members	**35**	**42.2**
6 - 10 members	**42**	**50.6**
Over 10 family members	**3**	**3.6**
Total	**83**	**100.0**

Table 5.5: Distribution by Size of Household

5.2.7 Monthly Household Income

The AHP project targeted the low income group(KShs.0-149,999) who would otherwise find it difficult to afford the houses that were in the market, as according to the CAHF only about 11 percent of Kenyans earn enough to support a mortgage. This is the reason the government capped the costs of houses under AHP and had their strategic partners innovate technologies and materials to ensure lower construction costs. Results of the study in Table 5.5 show that out of the 83 respondents only 11 (13.3%) indicated that the monthly household income was between Shs.20,000 and Shs.50,000. The rest of the respondents stated that their monthly family income was over Shs.50,000.

	Frequency	**Percent**
Below KShs.20,000	**0**	**0.0**
KSh. 20,001 - 50,000	**11**	**13.3**
KShs. 50,001-150,000	**64**	**77.1**
Over KSh. 150,000	**8**	**9.6**
Total	**83**	**100.0**

Table 5.6: Monthly Household Income

5.3 Assessment of the Housing Needs of Inner City Areas

In this section the researcher sought to assess the housing needs of inner city areas which included the cost of the house, number of rooms, use of the house, adequacy of the space available, bills, affordability, transport, physical infrastructure, adequacy of services and the quality of lighting and ventilation of the houses. The findings are presented in the subsequent sections.

5.3.1 Reasons for Living Around Ngara

The respondents were asked to state why they had chosen to live around Ngara. According to the study findings in Table 5.6 all the participants indicated that they are living in Ngara because of its proximity to town. The results also show that 38(45.8%) respondents indicated that the good infrastructure in Ngara attracted them to live in Ngara. Less than one third (30.1%) cited affordability of the house as the reason for living in Ngara. The study established that only a few respondents (9.6%) have been living in Ngara since childhood. The study therefore can conclude that the main reason as to why the respondents are living in Ngara was due to its proximity to town and the infrastructure. The study also can concluded that the natives of Ngara did not benefit from the redevelopment project as only a few of those who have been living in Ngara for long have benefited from the project.

Table 5.8: Reasons for Living in Ngara

	Frequency	Percent
Proximity to town	83	100.0
Good infrastructure and social facilities	38	45.8
Affordability of houses	25	30.1
Been living in Ngara since childhood	8	9.6

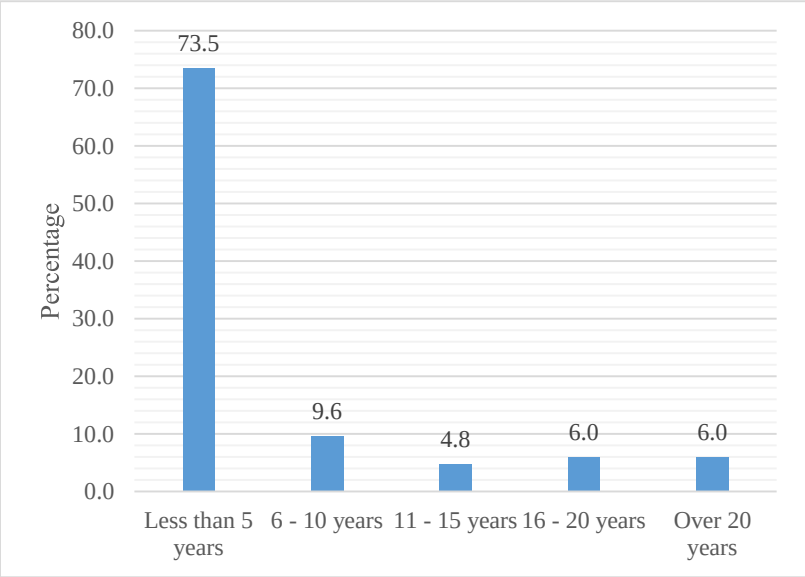
Table 5.7: Reasons for living in Ngara

The respondents were asked to state some of the reasons why they lived in Ngara. Table 8 show that all the respondents indicated that they lived in Ngara due to its proximity to town and the fact that it had good infrastructure and social facilities. The results show that 27(90%) of the respondents indicated that affordability of the houses was the reason they were living in Ngara.

5.3.2 Duration Lived in Ngara

The study sought to determine from the respondents how long they have lived in Ngara. The study findings in Figure 5.3 show that a majority of the respondents (73.5%) have lived in Ngara for less than 5 years. The results also show that 9.6% of the respondents have

lived in Ngara for at least 6 years. The researcher concludes that most of the respondents are new to Ngara, maybe they came to Ngara because of the new houses.



There was a follow-up question to determine how many lived in Ngara before the redevelopment. According to the study findings as presented in Table 5.7, only 22 (26.5%) of the respondents lived in Ngara prior to redevelopment. Just as the previous findings, most of the respondents came to Ngara as a result of the new development according to the results.

Fig 5.2: Duration lived in Ngara

5.3.4 Have Benefited from New Development

The study sought to establish from the respondents who have lived in Ngara before the redevelopment, whether they benefited from the new development. The study findings in Figure 5.10 show that only 26% of the respondents indicated that they have indeed benefited from the new development. Majority of the respondents (58%) did not respond to the question. This is due to the fact that the question was a follow-up to earlier question as to targeting those had lived in Ngara prior to the redevelopment and therefore the response depended on whether they had lived or not. The results also mean that most of the beneficiaries of the affordable housing in Ngara's Park Road were previously never lived in and around Ngara. However, the new development was beneficial to the residents.

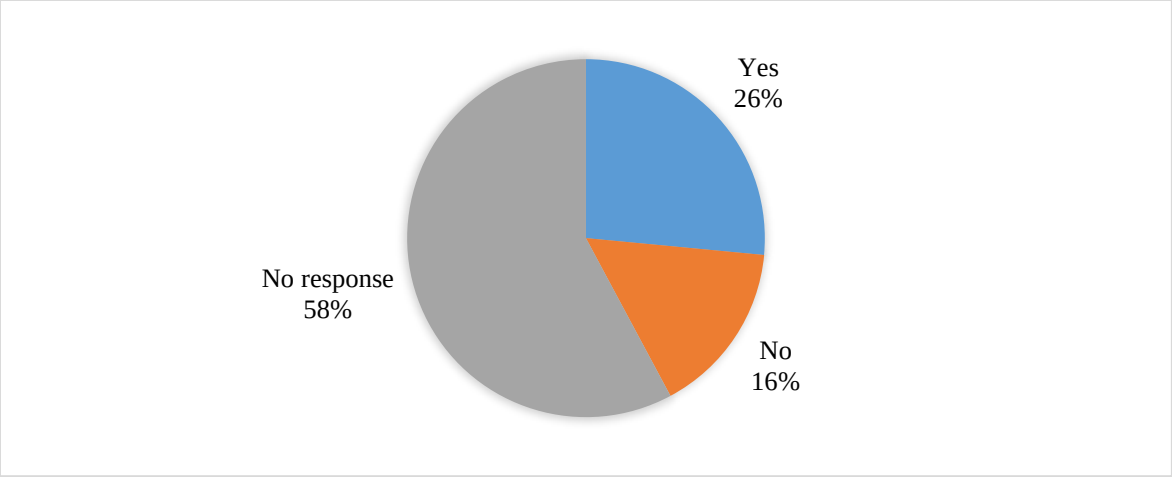


Fig 5.3: Benefited from New Development

5.3.5 Ownership of the Houses

The study sought to determine whether the respondents owned the houses or they rented. The results in Table 5.8 show that majority of the respondents (68, 81.8%) rented the houses. The results show that only 15(18.1%) owned the houses. The researcher sought to determine whether there were available houses which had not been sold and found that all were sold out. This implies that the houses were purchased and rented out.

	Frequency	**Percent**
Own	**59**	**71**
Rent	**24**	**29**
Total	**83**	**100.0**
	Frequency	**Percent**

Table 5.8: Ownership of the houses

5.3.6 Amount Paid for Rent per Month

The respondents were asked to state how much they were paying in rent per month. According to findings in Table 5.12, among the 19 respondents who did not respond to the question are those who lived in their own houses. The results show that 17(20.5%) respondents were paying a rent of Sh. 23,000 per month while another 7(8.4%) paid Sh. 25,000 per month. These are one bedroomed houses. The study also found that 21(25.3%) respondents paid Sh. 28,000 per month in rent which is the two bedroomed house. The study found that 12(14.5%) paid a monthly rent of Sh. 40,000 while 3 paid Sh. 45,000 and Sh. 50,000. These are three bedroomed houses. The results mean that most respondents paid a monthly rent of average Sh. 25,000 which is one and two bedroomed houses. These type of houses were on high demand in Ngara. This was proved by the number of people who were visiting the estate management office to enquire whether there were vacancies in the one and two bedrooms which they were turned away that this type of houses were fully occupied. However, the three bedroomed houses had many vacancies. This means that three bedroomed house is not so popular with many people. This may be due to the cost of the rent which is comparable to market rates for similar sized units in the area.

	Frequency	Percent
Not responded	19	22.9
23,000	17	20.5
25,000	7	8.4
28,000	21	25.3
40,000	12	14.5
43,000	1	1.2
45,000	3	3.6
50,000	3	3.6
Total	83	100.0

Table 5.9: Amount Paid for Rent per Month

5.3.7 Use House for Other Purposes

Respondents were asked to state whether they used the houses for other purposes such as subletting among others. Results in Table 5.10 show that 13(15.7%) respondents indicated that indeed they used the houses other purposes. Those who have indicated to use the house for other purposes explained that they decided to sublet the house so that they can earn some income noting that the houses were fetching some good monthly income. According to Kieti, Rukwaro and Olima (2020), the ministry allowed the beneficiaries to sublet one of the rooms particularly those with two and three bedrooms so that they can earn some income. The fact that most of the beneficiaries sublet the whole house means that the beneficiaries either own other houses elsewhere which is contrary to the goal of the AHP intention that only first time home owners to benefit.

	Frequency	**Percent**
Yes	**7**	**8.4**
No	**71**	**91.6**
Total	**83**	**100**

Table 5.10: Use House for Other Purposes

5.3.8 Adequacy of Space

The respondents were asked to state the extent to which the considered the space adequate for the household needs in terms of the number of rooms, playing space for children and accessibility for special groups. According to the results in Table 5.11, according to 55.4% of the respondents, the size of the house in terms of the number of rooms was adequate to a great extent while 13.3% of the respondents noted that the size of the house was adequate to very great extent. 22.9% of the respondents noted that the were satisfied with the size of the house. The results thus mean that by redevelopment, the government was able to largely satisfy the needs of the people with regard to the size of the house in the AHP project in Ngara.

	Small extent	Moderate extent	Great extent	Very great extent
House size	8.4	22.9	55.4	13.3
Open space	10.8	45.8	27.7	15.7
Accessibility for special groups	13.3	25.3	36.1	25.3

Table 5.11: Adequacy of Space

In terms of the open space for the children to play, the results show that most of the respondents (45.8%) the open space for the children was adequate to a moderate extent. The results further show that 27.7% of the respondents are of the opinion that the open space was adequate to a great extent. The results of the study mean that the respondents were satisfied with the space available for their children to play. During an enquiry by the researcher on the open space for the children, one of the participant noted that there was once an open space left for the children but was latter planted with grass and trees and children have since been barred from playing in the area.

Pic 1: Open field where children used to play but now out of bounds for children

The children have now been left to play on the available pavements which are wide enough for the children to play and vehicles still maneuver their way. As to the accessibility for the special group, that is the aged, children and the disabled, the results show that 36.1% of the respondents indicated that the accessibility for the special group was adequate to a great extent while 25.3% indicated that accessibility was adequate to very great extent.

The researcher saw ramps for those people who are unable to use the stairs. The researcher also observed that there were lifts to aid the people living in the higher floors of the house to access their houses. The results thus mean that the respondents were generally satisfied with the accessibility for the special groups meaning that the needs of the people were largely met in terms of accessibility for the special groups.

Pic 2: Children playing on the road due to lack of open space for playing

5.3.9 Other Bills Paid

The respondents were asked to state what other bills they were paying and the cost per month. The study findings show that all the respondents indicated that all the respondents indicated that they pay for electricity, water and security. Further, nearly all the respondents (98.8%) indicated that they paid for garbage collection. The results show that 51.8% of the respondents paid for internet.

	Frequency	**Percent**
Electricity	83	100
Water	83	100
Garbage collection	82	98.8
Internet	43	51.8
Security	83	100

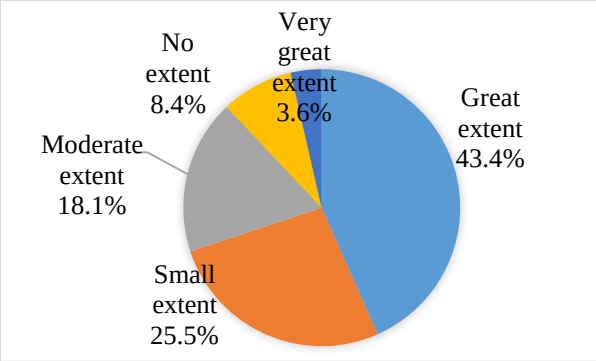
Table 5.12: Other bills paid

The study established that residents on average paid Shs.3,000 monthly for utilities which include security lights and garbage which is mandatory for all. However, the lights in the house, water and electricity in the houses and internet. The study established the bills for water ranged between Shs.600 and Shs. 2,500 for majority of the respondent households. This is dependent on individual usage of

water. Electricity on the other hand ranged between Shs.1,000 and Shs.2,000 for most of the respondent households. The internet for most of the respondents ranged between Shs. 3,000 and Shs.5,000 for many households.

5.3.10 Affordability

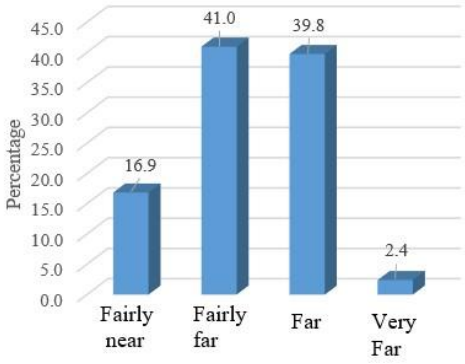
Respondents were asked to state the extent to which they considered the total cost affordable. The results in Figure 5.13 show that



43.4% of the respondents considered the total cost affordable while 25.5% of the respondents considered the total cost affordable only to a small extent. 18.1% of the respondents see the total cost as affordable only to moderate extent. The results of the study mean that most of the respondents think that the total cost affordable may be due to the fact that many of them are in the middle income group.

Fig 5.4: Cost Affordability

5.3.11. Distance from House to Work



The respondents were asked to describe the distance from house to place of work. The results in Figure 6 below show that 41% of the respondents indicated that the distance from their houses to work was fairly near while 16.9% indicated that the distance was very near. However, for 39.8% of the respondents, the distance was far and 2.4% of the respondents described the distance as very far.

Fig 5.5: Distance from House to Work

5.3.12 Means of Transport to Work

The study sought to determine the means of transport that the respondents used to go to work. The results in Table 5.14 show that a majority of the respondents (49, 59%) used their personal cars to go to work. The results further show that 34.9% of the respondents used matatus to go to work while (5,6%) went to work on foot. The study findings mean that in as much as the proximity to town was among the reasons for choosing to live in Ngara, most of the participants used some kind of transport either personal cars or matatu to get to work. This implies that most probably, their workplace is not necessarily in town but in some location far from home and thus need for motorized transport.

	Frequency	**Percent**
On foot	5	6.0
Matatu	29	34.9
Own car	49	59.0
Total	**83**	**100.0**

Table 5.13: Means of Transport to Work

5.3.13 Adequacy of Physical Facilities within Estate

The respondents were asked to state how they rated the adequacy of the physical facilities available within the estate. These included the roads, storm water drainage, street lights, pedestrian walkways, solid waste management and community facilities. The results in table 5.14 show that for most of the respondents (50, 60.2%), the roads were above average. Further 21(25.3%) indicated that the roads were excellent. The results also show that with regard to the storm water drainage, 41(49.4%) respondents rated it as above average while 24(28.9%) rated it as excellent. The researcher on enquiring more on the drainage of the storm water was told that when it rains there are no pool of water left behind as all are drained to the trenches.

	Below average		**Average**		**Above average**		**Excellent**	
	N	%	N	%	N	%	N	%

Roads	0	0	12	14.5	50	60.2	21	25.3
Storm water drainage	0	0	18	21.7	41	49.4	24	28.9
Street lights	0	0	10	12	43	51.8	30	36.1
Pedestrian walkways	7	8.4	35	42.2	26	31.3	15	18.1
Solid waste management	0	0	15	18.1	45	54.2	23	27.7
Community facilities	37	44.6	31	37.3	9	10.8	6	7.2

Table 5.14: Adequacy of Physical Facilities within Estate

With regard to the street lights, the results show that 43(51.8%) respondents described the street lights as above average while 30(36.1%) described it as excellent. The results mean that generally, the street lights were largely adequate. The researcher observed that there were street solar lights adjacent to the roads and other common spaces were lit by lights.

Pic. 3. Street lights

With regard to the pedestrian walkways, 35(42.2%) respondents described it as averagely adequate while 26(31.3%) described its adequacy as above average and 15(18.1%) described it as excellent. The researcher asked the respondents why they rated the pedestrian walkway in the manner which they did, and some indicated that though the walkways were available, they were the same ones used by the vehicles and thus posing accident risk to the residents especially the children.

Pic 4: Residents walking on the road in the estate

As for solid waste management in the estate, the results show that 45(54.2%) respondents rated the adequacy as above average. The results also show that 23(27.7%) respondents described the waste management in the estate as excellent. The researcher asked the respondents how the solid waste was managed. The respondents noted that a private service provider hired by the estate management issues plastic bags to every house where they are expected to put all their wastes and take to central collection point from where the service provider collects them regularly for dumping in the dumpsite.

The study sought to establish how that respondents rated the adequacy of community facilities. According to the study findings most of the respondents (37, 44.6%) described its adequacy as below average. The results also show that (31, 37.3%) respondents described it as average. The researcher enquired from the respondents to clarify their responses where some of the respondents said that the estate ought to have been provided with a better place for the children to play. However, other respondents noted that the estate was served well with community facilities such as social halls and shopping area. The results thus mean that the estate was to some extent adequately supplied with community facilities.

5.3.14 Adequacy of Services within Ngara

The respondents were asked to rate the adequacy of the water and electricity services within Ngara. The results in Table 5.15 show that 34(41%) described the availability of water in Ngara as below average. The results further show that another 34(41%) described it as average and 11(13.3%) describing it as above average. The researcher asked the respondents to elaborate on their answers and some respondents said that water does not reach their houses particularly those living in the upper floors due to inadequate pressure. This challenge may allude to strained service provision. Kiai(2019) points to this as a challenge of densified urban neighborhoods.

The study findings show that most of the respondents (43, 51.8%) rated electricuity as above average while 21(25.3%) rated it as average. Respondents noted that electricity in Ngara was very stable with few outages. They further noted that challenges such as power outages are promply addressed due to the proximity of the Power Company sub-station to Ngara. The results therefore mean that the electricity in Ngara is satisfactory.

	Below average		**Average**		**Above average**		**Excellent**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Water	34	41	34	41	11	13.3	4	4.8
Electricity	9	10.8	21	25.3	43	51.8	10	12

Table 5.15: Adequacy of Services within Ngara

5.3.15 Quality of the House Lighting and Ventilation

The respondents were asked to rate the quality of the house lighting and ventilation. The results of the study in Table 5.16 show that most of the respondents (41, 49.4%) described the quality of lighting as above average. The results further show that 16(19.3%) of the respondents described the quality of lighting in their houses as excellent and the same proportion described it as average. The results thus mean that the quality of lighting for the AHP was satisfactory to most of the respondents.

	Below average		Average		Above average		Excellent	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Lighting	10	12	41	49.4	16	19.3	16	19.3
Ventilation	20	24.1	41	49.4	12	14.5	10	12
General Design	7	8.4	15	18.1	49	59	12	14.5

Table 5.16: Quality of the House Lighting and Ventilation

With regard to the ventilation, the study established that most of the respondents 41(49.4%) described the quality of the ventilation as average while 20(24.1%) described it as below average. This may be attributed to the deep plans of blocks within the estate. The researcher asked the respondents to explain their answers and some respondents stated that even though the windows were big, too many houses were put together which compromised circulation of air and also that the corridor facing ablution areas compromised air quality along corridors.

On lighting,51(61.4%) considered lighting average and below while 32(38.6%) considered it above average. This mostly affected houses on lower floors of proximal tall blocks. This may be attributed to the deep plans of blocks within the estate, proximity of blocks and size of windows vis-à-vis depth of rooms.

Pic 5: Display of windows of AHP in Ngara

The long corridors ware observed to contribute to poor lighting of indoor spaces for all blocks. The researcher asked the respondents about the general design of the houses. The results show that majority of the respondents (49, 59%) indicated that the quality of the design of the house was above average. The results show that only 12(14.5%) respondents indicated that the general design of the houses was excellent. When asked to elaborate on their answers, they noted that the general outlay of the estate was okay particularly

concerning availability of such facilities as social halls, the shopping center which included a space for a supermarket. Respondents also noted that the available space was utilized economically making the beneficiaries live with dignity.

Fig 5: corridors noted across all blocks (Source: Adopted by author)

5.3.16 Privacy of The House Units

It was observed that most units within the estate have doors directly facing each other, thereby compromising on privacy of residents. The researcher also observed that most of the units remained closed throughout the period of data collection even when residents were indoors. This may be due to the perceived lack of privacy with neighboring houses.

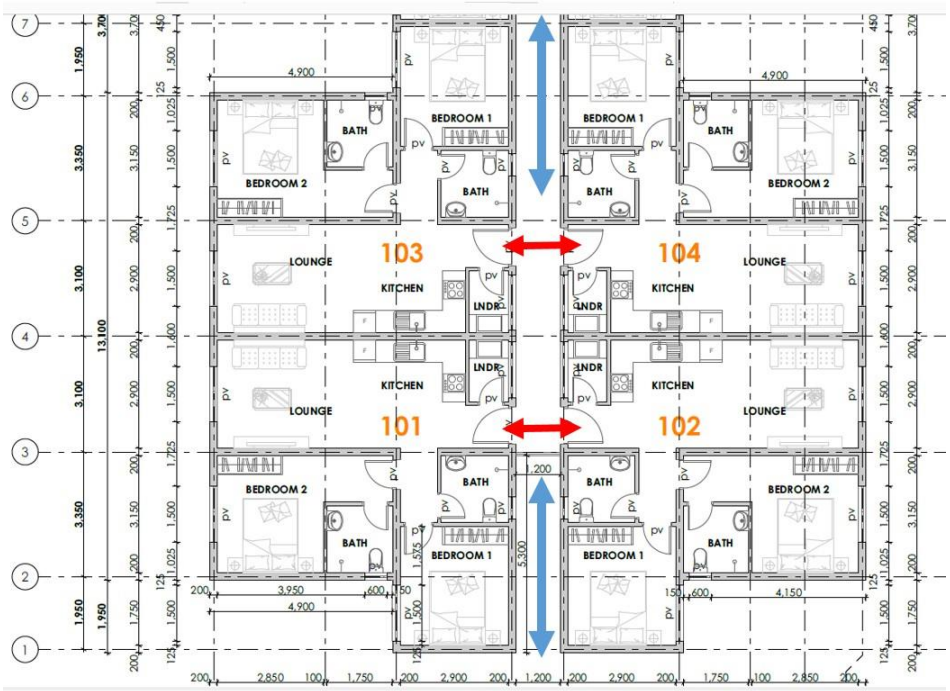


Fig 6: Opposite doors directly face each others (Source:Adopted by author)

5.3.17 Social Infrastructure

It was observed that there are no new public schools or hospitals being developed within the larger Ngara despite the influx in the number of residents occasioned by redevelopment of the AHE. Only one new private hospital was noted to have been developed. This alludes to a failure to comply with the guidelines of the Physical Planning regulations regarding provision of social services.

5.3.18 Ideal Housing for Ngara

The respondents were asked to state in their opinion the ideal housing for Ngara. Some respondents noted that the housing in Ngara ought to have considered the people who are just starting life and therefore just need a small house such as a bed sitter. Respondents explained that this will be more affordable to the students who are going to the learning institutions around. The respondents also noted that four bedroomed houses ought to have been constructed for those who can afford. Respondents further noted that despite the houses having lifts to access the houses in the higher floors, there ought to be plans to make the water reach the houses on the top since currently, water does not get to the top and this has become a nightmare to the occupants of such houses.

5.3.19 Opinion Sought in Public Participation Forum

The study sought to establish whether the respondents were called upon to give opinion in public participation forum. According to the study findings none of the respondents indicated that they were called upon to give opinion in public participation forums.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

The objectives of this study were first, to identify strategies that the Government of Kenya has deployed towards housing within inner city areas particularly in the case of the affordable housing initiative, to establish their effectiveness in meeting needs of residents and lastly to propose strategies that could bear the greatest benefit to all stakeholders involved in inner city housing.

6.1. Conclusions

From the findings of this study, it is apparent that many of the strategies were not adequately implemented. The policy strategies on social, economic and environmental aspects would be ideal if followed to the letter. It is evident that many of them have not been effective in meeting the targeted objectives which aimed at achieving decent, affordable and sustainable housing. The following are the conclusions that have been deduced.

The affordable housing policy requires that 20% of units in any AHP should be dedicated to social housing in order to accomodate those that earn less than KShs. 20,000. Shihembetsa(1995) noted that inner-city areas have a high potential for the urban poor in terms of the opportunities to earn them a living as compared to the peripheral sites of the city. He further observed that the high population density and a concentration of economic and public activities in the inner city open a multitude of formal and informal income earning opportunities to the urban poor, such as working in small scale manufacturing or as hawkers, porters or security guards. According to the KNBS (2019), the avergh age salary of low cadre jobs in the formal sector is KShs. 14,000 and could be lower in the informal sector. This therefore means that residents in the low income cadre cannot afford the units with the redeveloped affordable housing estate and will inevitably be forced out of Ngara. Among the respondents of this study, there were none that were in the low income bracket, indpicating that the project is gentrified. The study also established that only 10% of the houses were taken up by the lower middle income group earning between KShs.20,000-KShs.50,000 while majority of the units were taken up by the upper middle group otherwise referred to as the mortgage group earning between KShs. 50,000-150,000. This serves as an indicator of massive gentrification as evidenced by the finding that only 20% of the respondents lived in Ngara before redevelopment.

Another key policy objective for the project was social inclusivity, and the strategy was to allow for fair distribution of the houses among all Kenyans who would be eligible and willing to be beneficiaries. Traditionally, inner city areas were largely inhabited by people working in the

informal sector and who could walk to work in the CBD and the industrial area. This study established that majority of the respondents (70%) who own the houses are college educated, civil servants of whom majority use motorized transport to work owing to the distance of their workplaces. This has both social and environmental implications. Socially, it upsets the cultural genetic makeup of Ngara which was a rich mix of people from all walks of life. Environmentally, the use of motorized transport contributes to the burden of air pollution due to carbon emission and in the long run contributes to our carbon footprint.

In keeping with the policy objective of creating thriving neighbourhoods, one of the strategies adopted was inclusivity and social equity in the distribution of the completed housing units across demographic groups. In the case of Singapore, having realized the importance of including the young (below 35 years) and the old (over 60 years) in home ownership schemes, a lifecycle approach towards the public housing system was introduced. For the elderly, strategies to help them monetize their housing assets through sub-letting part of the house and a lease buy back schemes that allows the elderly to sell back their units to their housing development board. For the young, housing grant schemes were introduced to help them buy subsidized houses. to cater for the needs of the young and the elderly. Gender equity is also a right guaranteed under Article 27 of Kenyan Constitution. This study established that the ownership age bracket peaks at those between 41-50 years of age (80%) with very few units owned by the elderly above 60 years (10%) and the younger generation, below 40 years (10%). On gender distribution, majority of the units (80%), are owned by men while only 20% are owned by women. This goes against tenets of equitable distribution enshrined in our constitution. The study also observed that there are no residents of Asian origin within the affordable housing estate despite Ngara being traditionally an enclave of residents of Asian origin during and post-colonial eras. It was established in the field study that there is dominance of ownership by native Kenyans and a sizeable Somali population at 30%. This points to population flight and a lack of preservation of ambience to ensure continuity and identity of the place, thereby upsetting the cultural preservation aspect which is key in sustainable, thriving neighborhoods.

A key marketing strategy identified for the affordable housing program in general was public participation and would entail communication and engagement of Kenyans to explain aims of the program and key aspects on registration, allocation of homes, and other salient features. In Kenya, public participation in public projects is a requirement under several legislative frameworks including the Land Act of 2012, the Urban Areas and Cities Act of 2015 and the Land Use Planning bill of 2015. However, among the respondents of this study, no respondent was involved in any public participation activities for any aspect of the project thereby possibly contravening the various legislative guiselines.

Promoting home ownership was a policy strategy of the affordable housing project. The sectional properties Act of 2020 allows for sub-division of buildings into units which can then be owned by private individuals. There have been schorlarly arguments about privatization of public urban spaces. All the respondents of this study are owner-occupiers of the housing units, thereby bringing to the fore critical discussions on the concerns raised by the Right to the city concept that that emphasizes the idea that public urban spaces should be left public so as to enable them to be inclusive, democratic, accessible to all residents and aims to address the spatial inequalities that have resulted from the commodification and capitalist control of urban spaces.

Key design strategies for the physical and environmental aspects of the project included provision of open spaces, provision of adequate vehicular and pedestrian accesses, provision of community facilities, use of eco-friendly, cost cutting and efficient building technologies, provision of adequate indoor spaces and ensuring safety and security of residents. The physical planning handbook and the building code provide guidance for these provisions. On the choice of building materials, the cradle-to-cradle design approach calls for use of materials that can be recycled at a building's end of life, and advocates for use of building materials that have low embodied energy. However, this project makes use of materials that have been rated as having the highest embodied energy i.e concrete and glass to a large extent. Also, there does not appear to be a proper design for disassembly as frames and slabs for the blocks were cast-in-situ. There was noted to be expansive cabro-paved surfaces which bear substantial impact to the micro climate of the estate. From the respondents of this study, the overall design of indoor spaces were rated as being average, with the size of the rooms being rated average and open spaces provision being below average. Lighting and ventilation for the houses were rated below average, with long dark, poorly ventilated corridors being observed. There is little consideration for privacy as doors for units on either side of the corridors are directly placed opposite each other. This was noted to be a possible cause for the deserted corridors and doors that were noted to remain shut for most of the day time. These point to a lack of proper understanding of space in the context of the Kenyan culture which is attributable to adoption of designs that were not done locally. The highrise blocks require the use of lifts, thereby increasing the consumption of energy.

The Physical Planning handbook provides guidelines for provision of child-friendly open spaces where children can mix in play, and includes safe cycling paths and walkways. The defensible space theory suggests that the physical design of such spaces should include three key elements − territoriality, surveillance, and image as a means to reduce crime. In the affordable housing estate it was observed that that many kids were playing

on paved driveways, and devoid of pedestrian walkways and cycling paths. The only available sizeable green space was cordoned off over the period of collection of data for this study, thereby alluding to the fact that little consideration was given for children and pedestrians.

6.2 Research Recommendations

From the above, the research recommends;

1. Provision of a Range of Housing Types and Choices

In similar future projects, housing typologies provided should allow for flexibility and adaptability of the units to suit different stages of life. The Singaporean 'lifecycle approach' model can be adopted in the planning and design of housing units to accommodate concepts such as subletting. A possible design strategy that can be adopted is inclusion of servant quarters which can be rented out by the main occupant if need arises.

Inclusion of social housing in each public housing project within inner city areas should also be considered in order to accommodate low income segments of the currents residents and also serve as mitigation for total gentrification. Consideration should to given to other urban transformation tools, such as the integrated approach, upgrading and conservation, so as to retain a part of the rich heritage that inner city areas bear.

2.Improvement and Upgrading of Infrastructure and Service Facilities

The existing infrastructural and service facilities require inclusion of pedestrian walkways and cycling paths, which should extend beyond the boundaries of estates to allow for connectivity to the CBD and the industrial area as well. This will encourage use of non-motorized transport(NMT) modes hence reduce impact of air pollution by reducing carbon emissions.

3. Participation of All Stakeholders

Past experience worldwide has revealed that stakeholder participation at all levels of the planning is an important factor for the success of any programme. A strong emphasis should be put on the public, private and community participation. Thus, the involvement of the resident community, along with the policy makers and technical experts, during the entire decision-making process is crucial. This will provide a broad

framework for plan implementation through the organization and management structure of the institutional arrangements. It will also enable the harnessing, stimulation and mobilization of the natural, material, financial and human resources needed for the plan implementation.

6.3 Areas for future research

This study recommends further study on the sustainability of high density developments within inner city areas and the impact that they have on surrounding neighborhoods, including the CBD and the Industrial area.

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APPENDICES

APPENDIX 1 - HOUSEHOLD QUESTIONNAIRE:

UNIVERSITY OF NAIROBI
DEPARTMENT OF ARCHITECTURE
Title of RESEARCH PROJECT: PUBLIC HOUSING WITHIN INNER CITY AREAS: A CASE STUDY OF PARK ROAD ESTATE, NAIROBI.

QUESTIONNAIRE FOR RESIDENTS

Kindly answer the following questions as accurately as possible. Your individual response is strictly confidential and anonymous as your name shall not appear anywhere in the report. The answers shall be used for academic purposes only. Please tick in appropriately where provided corresponding to whatever your choice is or state briefly where necessary.

1. Which estate do you reside in Ngara? AHP ( ) Old/New Ngara ( ) CSHSF ( )
2. What age bracket do you belong? Below 25 years ( ) 25 – 30 years ( ) 31 – 40 years ( ) 41 – 50 years ( ) 51 – 60 years ( )` Over 60 years ( )
3. What is your occupation? Teacher ( ) Doctor ( ) Lawyer ( ) Engineer ( ) Jua Kali artisan ( ) Others (specify)_____
4. What is your gender? Male ( ) Female ( )
5. What race are you? Kenyan ( ) Indian( ) Somali( )
6. What is your level of education? No education ( ) Primary ( ) Secondary ( ) College ( ) University ( ) Post University ( )
7. What is the size of your household? Less than 3 members ( ) 3-5 members ( ) 6 – 10 members ( ) Over 10 family members ( )
8. What is your household average monthly income? Less than Sh. 10,000 ( ) Sh. 10,001 - 15,000 ( ) 15,001 – 20,000 ( ) 20,001 – 50,000 ( ) Over 50,000 ( )
9. What are some of the reasons for living in Ngara? (can select more than one reason) Proximity to town( )

   Good infrastructure and social facilities ( ) Affordability of houses ( )Been living here since childhood ( )

Others (state) ( )

10. How long have you lived in Ngara?
11. Did you live here before redevelopment? If yes, did you benefit from the new development?
12. Do you own the House or rent? _____
13. If renting, how much do you pay in rent per month?_____
14. How many rooms is your residential unit? Single room ( ) Bed sitter ( ) Double room ( ) One bedroom ( ) Two bedrooms ( ) Three bedrooms ( )

    Others (specify)_____
15. To what extent do you consider the space adequate for your household needs in terms of the following:

	No extent	Small extent	Moderate extent	Great extent	Very great extent
House size (no of rooms)					
Open space (for play)					
Accessibility for special groups (aged, children, disabled)					

16. If number of rooms was not adequate in 11, how many rooms would be enough for your household?

    _____
17. What other bills do you pay for, and how much do they cost per month?

Items	**Yes**	**No**	**Amount Paid (Ksh)**
Electricity			
Water			
Garbage collection			
Internet			
Security			

18. To what extent do you consider the total cost affordable? No extent ( ) Small extent ( ) Moderate extent ( ) Great extent ( ) Very great extent
19. How would you describe the distance from your house to your place of work? Very near ( ) Fairly near ( ) Far ( ) Very far ( )

20. What means of transport do you use to go to work? On foot ( ) Bodaboda ( ) Matatu ( ) Staff bus ( ) Own car ( ) Others Specify)_____

21. How would you rate the adequacy of the following physical infrastructure within your estate?

	Very poor	**Below average**	**Average**	**Above average**	**Excellent**
Roads					
Storm water drainage					
Street lights					
Pedestrian walkways					
Solid waste management					
Community facilities					

22. How would you rate the adequacy of the following services within Ngara?

	Very poor	**Below average**	**Average**	**Above average**	**Excellent**
Water					
Electric power					

23. How would you rate the quality of your house's lighting and ventilation?

	Very poor	**Below average**	**Average**	**Above average**	**Excellent**
Lighting					
Ventilation					
General design					

24. What in your opinion is the ideal housing for Ngara?

_____

_____

25. Have you been called upon to give your opinion in a public participation forum? Yes( ) No ( )

APPENDIX 2- INTERVIEW SCHEDULE FOR GOVERNMENT AGENCIES

UNIVERSITY OF NAIROBI

DEPARTMENT OF ARCHITECTURE

Title of RESEARCH PROJECT: PUBLIC HOUSING WITHIN INNER CITY AREAS: A CASE STUDY OF PARK ROAD ESTATE, NAIROBI.

INTERVIEW SCHEDULE

QUESTIONS

1.How much land do you own in Ngara estate?

2. What are the past and current uses of the land?

3. What approach(es) of urban transformation has been adopted for Ngara?

4. What are the key objectives of transforming your property(ies).

5.What are the estate management structures adopted for your development?

6.What maintenance plan do you have for the development?

7. What strategies have been deployed towards the following thematic areas; i)Social

a) What considerations have been put to ensure adequate social infrastructure eg hospitals, schools, community halls meet new demand?

b) What considerations have been put to ensure inclusivity; for people of all ages, gender, socio-economic status?

c) To ensure preservation of local characteristics and culture; including retention of residents?

d) What considerations have been put to ensure provision of facilities for vulnerable groups eg the aged, the disabled and children?

e) What considerations have been put to ensure cohesive interaction/social activities through provision of secure social gathering spaces, complete with security features eg street light ii) Economic

a) What provisions have been made for economic activities/sustainance for residents?

b) Are there job opportunities created through the urban redevelopment processes or product?

c) What models have been used to finance the project(s)?

d) What models have been used to sell/rent the redeveloped houses to residents?

e) How have the following economic factors influenced delivery of the project;

-Cost of construction

-Accessibility of finance

-Interest rates

iii) Physical/ Environmental

a) Has the following physical infrastructure been upgraded to cater for new resident population?

-Roads

-Pedestrianized streets

-Water reticulation system

-Storm water drainage

b) What provisions have been made for open/ green spaces?

c) What is the density of the redeveloped property?

d) What measures have been put in place towards sustainable design of the new development(s)?

-Energy efficiency

-Sustainable materials

-Waste management

-Indoor air quality

e) What considerations have been put in place to ensure space adequacy?

f) Was there public participation in the design of the development?

6.How effective have the strategies been in meeting the key objectives of your urban transformation?

7. What challenges have you faced in transformation of Ngara?

8.Whats the long-term maintenance plan for the newly constructed housing?

9. What urban planning policies have guided your intervention(s) within Ngara?,, ,,,

END

THANK YOU