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**AFFORDABLE HOUSING SOLUTIONS FOR
LOW-INCOME COMMUNITIES IN
MOGADISHU**

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Master's Thesis

Supervisor

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DEDICATION

First and foremost, I thank ALLAH, God of all, for everything that happened in my life. All the praise and gratitude to Almighty ALLAH, the most gracious, the most merciful, who gave me the knowledge, courage and patience to accomplish this research, May the peace and blessings of Allah be upon Prophet Muhammad (PBUH) With all my appreciation, respect, and love that no words can ever express. I am thankful to my father, whose unwavering support and sacrifices formed the bedrock of my journey, and to my dear mother, whose love and encouragement sustained my spirit. Lastly, thanks to my advisor Asst. Prof. Dr. Erinç Onbay, whose mentorship and wisdom enriched this thesis your collective influence has shaped the essence of this work, illuminating my path to academic accomplishment.

ABSTRACT

AFFORDABLE HOUSING SOLUTIONS FOR LOW-INCOME COMMUNITIES IN MOGADISHU

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Rapid urbanization and socio-economic disparities in Mogadishu have precipitated a pressing need for affordable and culturally resonant housing solutions. This thesis critically examines the multifaceted challenges impeding access to quality housing for low-income communities in the city and proposes an integrative framework that combines sustainable design, incremental construction techniques, and adaptive policy measures. Utilizing a qualitative research methodology, the study synthesizes a comprehensive review of global literature with comparative analyses of successful case studies such as Quinta Monroy (Chile), LILAC (UK), and Casa Real (Mozambique) to identify best practices that are transferable to the Mogadishu context. The investigation focuses on the interplay between economic feasibility, environmental sustainability, and local cultural practices, revealing the potential of community-driven design and public-private partnerships in overcoming current market and policy deficiencies. The resultant framework not only addresses the immediate housing shortage but also lays the foundation for long-term urban resilience and inclusive development. By proposing actionable strategies that align with both global trends and local realities, this research contributes to a deeper understanding of how affordable housing initiatives can foster sustainable urban growth in post-conflict settings.

Keywords: Affordable Housing, Low-Income Communities, Rapid Urbanization, Urban Planning Policies, Mogadishu.

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ABBREVIATIONS

BRA	:	Banadir Regional Administration
CAH	:	Centre for Affordable Housing Finance in Africa
DRC	:	Danish Refugee Council
ICRC	:	International Committee of the Red Cross
IDP	:	Internally Displaced Persons
IIED	:	International Institute for Environment and Development
IOM	:	International Organization for Migration
IRC	:	International Rescue Committee
LWF	:	Lutheran World Federation
MPIC	:	Ministry of Planning, Investment, and Economic Development
MSF	:	Médecins Sans Frontières (Doctors Without Borders)
NRC	:	Norwegian Refugee Council
SREA	:	Somalia Real Estate Association
UNHCR	:	United Nations High Commissioner for Refugees
UN-Habitat	:	United Nations Human Settlements Programme
UNOCHA	:	United Nations Office for the Coordination of Humanitarian Affairs
WFP	:	World Food Program

1. INTRODUCTION

1.1 BACKGROUND OF STUDY

although access to affordable housing is a human right (OHCHR, 2009) The United Nations Human Settlements Programme estimates that around 150 million people are homeless and that 1.6 billion people live in substandard housing globally. Additionally, it was projected that there were about 1 billion people living in urban slums in 2015, which accounted for 32% of the world's urban population at the time. It was predicted that this number would rise to almost 2 billion people over the course of the following 30 years (UN-Habitat, 2017). The capital city of Somalia is one of the victims of the housing crisis. Mogadishu has been experiencing rare economic and demographic development over a few years. This rapid growth is informed by a combination of factors in its gradual stabilization, increased foreign investment, and the return of the Somali diaspora to their home; all these factors have contributed much to the revitalization and urban development of the said city. Yet, on the flip side, such progress has also caused enough pressure on the Mogadishu housing market. As more and more people moved into the capital to seek opportunity, so did the demand for housing continue to increase, hence leveraging an evident dire need for more affordable, sustainable, and accessible housing solutions down to the low-income level?

According to UN-Habitat, 2020a, the growth in Mogadishu's urban population is increasing at a higher rate than at which its infrastructures and housing capacity are growing, with the result that low-income people are finding it increasingly hard to have affordable and good-quality housing. This demand for low-cost housing in Mogadishu is exacerbated by the fact that the large population comprises several low-income families who cannot afford the attendant costs of good housing. In fact, for many of these low-income earners, most of the existing houses are either substandard or in areas with limited access to basic services and infrastructure (Bonnet et al., 2020). The high cost of land added to high construction materials has made the search for a housing solution within the economic reach of this segment of the population quite difficult. Therefore, there is an imminent need for housing designs that should not only be affordable but also culturally relevant, catering to the relevant community needs and being sustainable. Besides, Mogadishu's housing market can accommodate persons who are in a position to buy or

rent-require flexible scalable and adaptable models of housing suitable for various financial capabilities. Besides, Mogadishu's housing market can be in a position to accommodate people who are able to buy or rent-require flexible scalable and adaptable models of housing suitable for various financial capabilities.

In fact, affordable housing is universally accepted as a fundamental right and pre-requisite for sustainable urban development. One of the key concerns with development in burgeoning cities, as noted by the World Bank, involves a deficit in the availability of affordable housing and has sometimes resulted in the mushrooming of informal settlement growth with the proliferation of slums. These are exacerbated in Mogadishu by the housing policy deficiency, scarcity of government resources, and lack of regulatory frameworks that facilitate affordable housing programs. In low-income settings, access to secure and adequate living conditions becomes restricted, social and economic securities for normal citizens are denied. All affordable housing in Mogadishu needs to be designed within an economic feasibility framework that assures environmental viability and cultural acceptability for urban resilience and quality-of-life enhancement for the less fortunate (Bonnet et al., 2020).

1.2 PROBLEM STATEMENT

Access to suitable housing is currently a global issue due to financial inequalities population increase, and rapid urbanization (UN-Habitat, 2020a, 2020b). For low-income groups and those living below the poverty line, access to an affordable place to live is typically a challenge (Polèse, 2020). Similarly, Mogadishu is currently facing a serious affordable housing crisis characterized by a critical imbalance between the rising need for housing and the shortage of decent and affordable houses. Here are challenges Mogadishu faces.

- a. Rapid urbanization and population growth in Mogadishu have increased the need for housing.
- b. Economic and social inequalities make it difficult for low-income individuals to access quality housing.
- c. High land and construction costs limit the production of affordable housing.
- d. Current housing models are culturally and environmentally inappropriate.

- e. Policy framework deficiencies lead to inadequate government-private sector collaborations.

However, despite these economic and infrastructural challenges, current housing models in Mogadishu do not incorporate culturally sensitive design and sustainable construction methods. The current housing solutions do not meet the socio-cultural needs of the local population as well as the environmental needs of the area, which are crucial for the long-term sustainability of the urban area. Furthermore, the limited application of new and efficient building technologies, as well as traditional construction methods, limits the scalability and adaptability of housing developments.

As a result, millions of low-income residents are forced to live in dirty, very deplorable environments characterized by overcrowding, inadequate amenities, and absence of social amenities. Although it is an economic issue, the housing problem has a sociocultural component and should bear in mind the lifestyles, social relations, and privacy issues that are common among Somali communities.

This complex of economic, policy, cultural, and technical barriers highlights the importance of a systematic and integrative analysis that not only identifies the constraints but also combines the best international experiences with the specific local requirements to develop sustainable and culturally compatible housing solutions for Mogadishu's low-income communities.

1.3 RESEARCH PURPOSE

The study will investigate culturally relevant and affordable housing options for low-income families in Mogadishu. Considering all of the complicated socioeconomic and environmental issues that these communities face, this thesis will integrate cost-effective, sustainable, and contextually appropriate design principles for construction and rehabilitation in order to develop an affordable housing framework. The study seeks to propose innovative, sustainable, and scalable housing models tailored to Mogadishu's unique socio-cultural and environmental context, ultimately providing actionable recommendations to improve urban equity and quality of life.

1.4 RESEARCH OBJECTIVES

The thesis aims to explore affordable housing solutions for Mogadishu's urban context; the objectives of the study are as follows:

- a. To determine the challenges of housing demand and affordability for low-income communities in Mogadishu.
- b. To examine a few strategies which qualify under the categories of affordable housing policymaking, design, and construction?
- c. Integrating global best practices and case studies to propose sustainable, culturally relevant, and scalable housing strategies
- d. Identifying stakeholder roles, such as government, NGOs, and private developers, in implementing solutions.

This study focuses on affordable housing in urban (and suburban) settings since the shortage of affordable housing is more problematic in large cities and is estimated to get worse due to rapid urbanization in the years to come.

1.5 RESEARCH METHODOLOGY

This research adopts a mix of quantitative and qualitative approaches to explore affordable housing challenges in Mogadishu. The study focuses on global and local contexts, drawing on a comprehensive review of literature, case studies, and an analysis of the current housing situation in Mogadishu. The primary objective is to examine the issues surrounding affordable housing, evaluate successful international case studies, and develop potential solutions relevant to the unique circumstances of Mogadishu.

The research is based on secondary data obtained from various sources, including academic articles, government reports, and publications that address global housing issues and the strategies used by different countries to overcome housing crises. In addition, the study explores specific case studies of affordable housing projects from around the world, analyzing the approaches that have been successful in different socio-economic contexts. These case studies were selected based on their relevance to Mogadishu's challenges, ensuring a diverse range of perspectives and solutions. The review also investigates historical evaluations of housing policies, particularly in post-war contexts and developed countries, drawing valuable lessons that can inform affordable housing strategies in

Mogadishu.

The analytical framework for this research is grounded in the existing literature on affordable housing, supplemented by various theoretical models of urban planning and development. The study focuses on three key categories: government policies, design considerations, and construction strategies. Government policies are examined in terms of their impact on housing affordability, including land management, financing, and regulation. Design considerations are assessed based on their potential to provide cost-effective, sustainable, and community-oriented housing solutions. Construction strategies are explored to understand how local materials, labor, and innovative techniques can reduce costs without compromising quality.

The selected projects are Quinta Monroy (Chile) builds low-cost, expandable housing using an incremental construction model. LILAC (UK) provides sustainable, community-based housing solutions through a cooperative model. Casa Real (Mozambique) develops a durable, affordable housing model built with local materials. The above-mentioned projects are analyzed qualitatively to identify successful elements that can be applied to the Mogadishu context. This comparative approach highlights common practices, strategies, and design elements that contributed to the success of these projects, and it discusses how these solutions can be adapted to address the specific housing needs of Mogadishu. The study concludes by synthesizing the findings from the literature review, case studies, and theoretical framework, offering practical recommendations for designing affordable housing solutions tailored to the needs of low-income communities in Mogadishu.

2. CONCEPTUAL FOUNDATIONS OF AFFORDABLE HOUSING

Affordable housing has emerged as one of the most pressing global urban challenges, particularly in rapidly urbanizing regions where socio-economic and demographic pressures exacerbate housing shortages. Developing nations face compounded obstacles in meeting affordable housing demands, given limited financial resources, fragmented policies, and inadequate infrastructure to support sustainable urban growth (UN-Habitat, 2020a). According to UN-Habitat, more than a billion people currently live in inadequate housing conditions globally, and this figure is expected to rise in response to urban growth and migration trends (World Bank, 2018).

Mogadishu, Somalia's capital city, exemplifies the urban challenges associated with affordable housing. With a history marked by conflict and displacement, Mogadishu's urban landscape has undergone a significant transformation in recent years due to population growth, diaspora returnees, and economic revitalization efforts (Bellini et al., 2022). However, this growth has strained the housing market, leaving a large segment of the population particularly low-income residents without access to affordable and adequate shelter.

In this literature review, the study will be discussing significant topics related to affordable housing for low-income urban communities in the city of Mogadishu. It discusses definitions, historical evaluation of affordable housing, essential characteristics, Strategies for Affordable Housing and contextual housing needs that cast the foundation for both the principles of design and practical challenges in addressing this problem.

2.1 DEFINING AFFORDABLE HOUSING FOR LOW-INCOME URBAN COMMUNITIES

2.1.1 Definitions and Parameters of Affordable Housing

Affordable housing means houses that people can afford without spending too much of their income (UN-Habitat, 2020b). Affordable housing is a fundamental human need and an integral part of everyone's right to a sufficient standard of living (UN-Habitat, 2020b). To establish socially and economically diverse neighborhoods where inhabitants have access to first-rate amenities, services, facilities, and job opportunities, it is imperative that appropriate and reasonably priced housing be made available. Urban safety and livelihood opportunities, urban equity and inclusion, and adverse health issues can all be adversely affected by inadequate housing (UN-Habitat, 2020a).

The definition of affordable housing may vary depending on the country and circumstances. For example, in Australia, the National Affordable Housing Summit Group defined affordable housing as basically acceptable in terms of location and standard for lower or middle-income households and not so expensive that a household is unlikely to be able to sustainably meet other basic needs (Queensland Affordable Housing Consortium, 2012). Affordable housing in the UK is described as intermediate and socially rented housing given to certain qualified households whose needs are not satisfied by the market (Scottish Government, 2009)]. "Affordable housing" is defined by the U.S. Department of Housing and Urban Development as housing where the occupant's housing expenses, including utilities, should not exceed 30% of their gross income (U.S. Department of Housing and Urban Development, 2024). Because the purpose of keeping housing costs below 30% of income is to ensure that households have adequate money to handle other nondiscretionary expenses, policymakers consider households that spend more than 30% of their income on housing expenses to be cost-burdened. The concept of "affordable housing" is somewhat ambiguous, with various initiatives and stakeholders' parties frequently defining it in slightly different ways (Chapman & Lowery, 2024).

According to Engels (2021), the housing problem arises from the contradiction between the modern development of large towns and the hereditary right of the proletariat to a home. This highlights the economic struggles faced by low-income groups. A common standard used is that housing costs should not exceed 30% of a household's income, which

helps measure affordability (Schwartz, 2021). A common starting point for determining affordability is this rule of thumb. However, affordability is more than just price. Adequate housing must involve access to infrastructure, public services, and employment opportunities in order to satisfy people's requirements (Dobbins et al., 2008). Similarly, the United Nations Economic Commission for Europe (UNECE) emphasizes that affordability is a multi-dimensional concept, covering economic, social, and environmental factors (UNECE, 2015).

According to the 1996 Revised European Social Charter (RESC), affordable housing is any type of housing where a household can maintain a basic standard of living as determined by the society in which they live by paying the upfront costs (deposit, advance rent), ongoing rent, and/or other costs (utility, maintenance, and management charges) over an extended period of time (Maschaykh, 2015).

Another simpler definition, called the 30 percent rule, states that a house is considered cheap if the household's housing expenses, including utilities, do not exceed 30 percent of their income (Belsky et al., 2005; Woetzel et al., 2014). Therefore, it is preferable to define affordable housing as a residence that permits the household to spend a portion of the income for housing costs (including running costs like utilities and maintenance costs) while being able to save the remainder for other priorities like food, healthcare, clothing, and education to maintain a good standard of living, given the criticisms of the 30 percent rule and the disagreement over how to accurately measure affordability (Emekci, 2021; Maschaykh, 2015; O'Dell et al., 2004; Pivo, 2013). Consequently, "housing affordability is not just about financial viability. It is also about positive functional aspect of a housing to provide a reasonable quality of living conditions" (Maschaykh, 2015).

In general, affordable housing is defined as being in a good sufficient location and of a high enough standard without being as costly as to deny those who live their access to other essentials of daily life or affect their enjoyment of fundamental human rights. Many factors influence housing affordability, including occupational variables including land leases, service charges, mortgage rates, etc.; capital variables including land or infrastructure or building materials, etc.

However, in assessing affordability, there are three prevalent metrics categorized into two components: housing expenses and household income. These statistics are the house price to income ratio, which is determined by taking the median household income and dividing it by the median house price. This calculation illustrates how many median yearly salaries are needed to purchase a median-priced home (Maschaykh, 2015).

Access to affordable housing for those with low and middle incomes is becoming increasingly challenging due to rising home prices. Affordability for low-income urban neighborhoods is frequently correlated with government support, the availability of strategically located land, and the effectiveness of constructing techniques. Finding an affordable property becomes more challenging in the absence of these elements.

Affordable housing lacks a universally agreed-upon definition, as its understanding varies significantly based on economic, social, and regional contexts. Generally, affordable housing is defined as housing that meets the financial constraints of lower-income households without compromising their ability to afford other essential needs such as food, healthcare, and education (Friedrichs, Huttman, & van Vliet, 1988). In most developed nations, housing affordability is determined as a proportion of income, with 30% being a common threshold; households that spend more than this proportion on housing are often considered cost-burdened (Habitat for Humanity, 2016).

In the context of low-income communities, especially in urban settings, affordability cannot be discussed without considering the access to employment, health care and education. The World Bank and UN-Habitat underscore that affordable housing should not only be financially accessible but also physically located within a reasonable distance of essential services (UNDP, 2019). Additionally, affordability cannot be defined based on the price of the home or the monthly payment alone, it is important to note that affordability also refers to the overall costs of owning a home including maintenance and utility costs which are important in determining the sustainability of housing projects (Bonnet et al., 2020).

In a developing country like Somalia, the issue of affordability is also made complex by instability, high economic unemployment levels, and scarce formal channels through which financing can be obtained. Therefore, many Mogadishu's residents live in informal

housing since the concept of affordability is relative and is determined more by the need to find cheap accommodation than by any set parameters (IIED, 2016). These informal solutions are characterized by the absence of legal tenure and consequently a population characterized by poor insecurity and living standards, and this is in line with the provision of accessibility and challenges of affordable urban shelter (Affordable Housing Institute, 2021).

2.1.2 Socioeconomic and Cultural Dimensions of Affordability

The socioeconomic factors are the major influences on housing affordability; these include the income level, employment and transportation access. Diefendorf (1993) writes, in the post-war societies there was a problem of urban crisis which can be attributed to the disparity between the growth rates and the provision of affordable housing. This problem still exists, especially in the urban settings where low-income people find it hard to find affordable houses near to their workplaces. Transportation expenses and long travelling time can also worsen the affordability.

Cultural factors also have an impact on how affordability is defined and dealt with. For example, in collectivist societies where more people from the same family live under the same roof, this may sometimes involve larger houses than what the current affordability ratios provide for.

Another important criticism is social justice as it is related to housing affordability. Axelsson et al., point out that housing unaffordability is not only a financial problem but also a problem of justice (Axelsson et al., 2013). Discrimination in the housing market is one of the key factors which do not allow the members of the marginalized groups to get the proper housing, thus, sustaining the patterns of poverty. To tackle such problems, they recommend the increase in legal protection, community involvement and changes in the physical structure of the cities to make them friendlier to everyone (Axelsson et al., 2013).

To enhance the aspect of affordability there is the need to implement measures that will facilitate the integration of policies that promote the development of mixed income communities, optimal utilization of land and advanced construction techniques including prefabricated housing. The above strategies can therefore be used to make housing more affordable to many households.

2.2 HISTORICAL EVOLUTION OF AFFORDABLE HOUSING

How societies have adapted to shifting political, social, and economic demands over time is reflected in the history of affordable housing. Early social housing programs in Europe were prompted by the Industrial Revolution's increasing urbanization, which left working-class families living in cramped and unhygienic conditions (Engels, 2021).

In order to create the most positive impact when it comes to affordable housing, it is important to understand the history, policies, and key elements of the topic

2.2.1 Industrial Revolution and Urbanization

The Industrial Revolution and urbanization are two of the biggest factors that influenced the development of the world cities we live in today. These were never imaginable in the last 100 years, especially after the late 1700s when the Industrial Revolution took place. The global economy, culture and even the environment has been affected in one way or the other by the effects of urbanization and industrialization (Clark, 2013)..

The Industrial Revolution which started in the 18th century served as a significant shift in the history of mankind and changed the economy, society; it introduced profound technological advancements and reshaped the fabric of urban life (Clark, 2013). Urbanization, the process by which populations migrate to and grow cities, was deeply intertwined with this era of industrial growth, creating both opportunities and challenges that continue to shape modern urban environment (Engels, 2021).

2.2.1.1 The connection between the industrial revolution and urbanization

The Industrial Revolution catalyzed urbanization by concentrating production and economic activities in cities. Factories, powered by new technologies such as steam engines, required large workforces, drawing people from rural areas into urban centers (Clark, 2013). Cities like Manchester in the United Kingdom and Pittsburgh in the United States exemplified this transformation, becoming hubs of industrial activity and innovation. Figure 2.1 illustrates the extent of urbanization during the Industrial Revolution.



Figure 2.1: Urbanization During the Industrial Revolution (McNeill, 2011).

The revolution's economic incentives played a significant role in urbanization. As factories expanded, they created job opportunities that were not available in agricultural settings. This shift led to a population boom in urban areas; for example, between 1800 and 1900, London's population grew from approximately one million to over six million, primarily driven by industrial growth (McNeill, 2011).

2.2.1.2 Transformations in urban landscapes

Industrialization brought significant changes to urban landscapes, including the development of new infrastructure and housing. Railroads and canals were constructed to transport raw materials and finished goods, integrating cities into broader economic networks (Rodrigue, 2020). However, rapid urbanization also led to overpopulation and the presence of inadequate shelter and adequate transport infrastructure for the growing populations. Improperly developed neighborhoods or slums became a regular feature in industrial cities with poor housing and sanitation (Satterthwaite, 2020).

The same need to accommodate industrial production also affected the city layouts. Factories, warehouses, and worker housing were sometimes all located in the same region were creating highly specialized urban zones. For example, Birmingham in the United Kingdom was dubbed as the “Workshop of the World” because of the industrial establishments that were located within the city as well as having a large working-class population (Clark, 2013).

2.2.1.3 Urbanization and the demand for housing

The Industrial Revolution caused an unprecedented migration of people from rural to urban areas. Cities like Manchester, London, and Birmingham in England, and later Chicago and New York in the United States, became hubs of industrial activity. The demand for labor in factories and industries led to a surge in urban populations, often overwhelming the existing housing infrastructure (Engels, 1845).

This rapid urbanization created a significant strain on housing supply. Landlords responded by constructing tenement buildings, often poorly planned and overcrowded, to accommodate the influx of workers. These conditions led to the emergence of slums, where housing was both substandard and unaffordable for many working-class families (Clark, 2013). For example, by the mid-19th century, over 60% of the urban population in industrial cities like Manchester lived in overcrowded, unsanitary conditions (Engels, 1845).

The rapid urbanization of modern cities has resulted in an increasing demand for housing, often leading to significant price instability and market fluctuations. This phenomenon is closely linked to the inherent anarchy of production within the capitalist housing market, where supply is dictated by profit maximization rather than social need (Harvey, 1973). Unlike other sectors where prices are determined by relatively stable supply and demand dynamics, the housing market experiences extreme price fluctuations due to speculative investment practices and capital-driven interventions (Aalbers, 2016).

One of the primary reasons for such volatility is that housing is treated as a commodity for speculative investment rather than as a fundamental human need (Engels, 1872). As investors and developers prioritize short-term profits over long-term affordability, large-scale financial speculation has created housing bubbles in multiple urban centers worldwide (Glaeser & Gyourko, 2018). These speculative practices contribute to housing crises, driving up prices beyond the reach of low-income communities and exacerbating social inequalities (UN-Habitat, 2020a).

The capitalist housing market operates as one of the strongest free-market economies within global capitalism, often functioning with minimal government regulation (Madden & Marcuse, 2016). Unlike essential goods and services that are subject to state intervention

and price controls, housing remains largely influenced by private capital, leading to an imbalance between production and affordability (Rolnik, 2019). This deregulated nature enables large-scale real estate investors to manipulate market conditions, further intensifying the financialization of housing (Aalbers, 2016).

Capital's intervention in the housing sector deepens the anarchy of production, creating artificial shortages and speculative bubbles (Piketty, 2014). Investors often purchase large volumes of housing stock, leaving units vacant while waiting for price increases, thereby restricting supply and inflating costs (Fields, 2015). As a result, similar apartments within the same location can exhibit vast price differences, a trend less pronounced in other economic sectors where goods are traded based on intrinsic use value rather than speculative exchange value (Harvey, 2014).

Moreover, the speculative commodification of housing undermines urban stability by fostering cycles of boom and bust. When housing prices surge beyond sustainable levels, economic downturns lead to widespread foreclosures and homelessness, as witnessed in the 2008 financial crisis (Aalbers, 2009). These fluctuations disproportionately affect low-income communities, pushing them further into informal settlements and precarious living conditions (UN-Habitat, 2020b).

Addressing these issues requires a paradigm shift in housing policies, prioritizing regulatory measures that limit speculative investment and promote social housing initiatives. Governments must implement inclusionary zoning, rent controls, and financial disincentives for vacant properties to counteract the exploitative tendencies of capital-driven housing markets (Marcuse, 2009). Without such interventions, housing will continue to be treated primarily as an asset class rather than a fundamental right, perpetuating instability and social stratification in urban environments (UN-Habitat, 2022).

2.2.1.4 Impact on housing affordability

The industrial era saw the commodification of land and housing. As cities expanded, land prices in urban centers soared, pushing low-income populations to the periphery. This phenomenon created a divide between wealthy industrialists, who could afford spacious residences, and workers, who were forced into cramped and poorly ventilated housing units (Harvey, 1973).

Despite the challenges, the Industrial Revolution also led to the emergence of early affordable housing initiatives (Clark, 2013). Philanthropic efforts by industrialists such as George Peabody in London and Friedrich Krupp in Germany aimed to provide better living conditions for workers. Peabody Trust, established in 1862, built affordable, clean, and well-maintained housing for London's working class, setting an early example of social housing (Chase, 1995).

2.2.1.5 The role of technological advancements

The Industrial Revolution introduced technological innovations that influenced housing construction. New materials like steel and advancements in construction techniques made it possible to build taller and more durable structures, increasing urban housing density. Prefabricated housing, which emerged later in the industrial era, allowed for faster and more cost-effective construction, addressing some of the housing shortages (Smith, 2010).

However, these advancements were not immediately accessible to the working class due to high costs. Urban housing remained unaffordable for most laborers, highlighting the socio-economic disparities exacerbated by industrial urbanization (Smith, 2010).

2.2.1.6 Urban planning and affordable housing

The challenges posed by industrial urbanization eventually led to the development of urban planning as a discipline (Fishman, 1982). To overcome the challenges of overcrowding and enhancing cities they started quality use of zoning laws and building regulations. For example, the Public Health Act of 1875 in the United Kingdom ensured minimum housing standards, such as proper ventilation and sanitation, which were important for affordable housing developments (Fishman, 1982).

The Garden City Movement led by Ebenezer Howard whose book 'To-Morrow: A Peaceful Path to Real Reform' was published in 1898 also came as a solution to housing problems of industrial cities (Howard, 1898). This approach sought towards the creation of sustainable communities where housing, environment and work are integrated in a close manner as an answer to the congestion of the urban areas (Howard, 1898).

2.2.1.7 Legacy and contemporary lessons

The impact of the Industrial Revolution on urbanization and affordable housing has remained a influential factor in determining today's cities. While it called for housing policies and regulations, society Inequalities. The rate of urbanization in developing countries reflects the same problems that were seen during the industrial revolution where informal settlements and inadequate housing is a common feature in most cities (UN-Habitat, 2020a).

Based on the lessons learned during the Industrial Revolution, it is evident that the issue of affordable housing cannot be approached isolated from technological advancements and the role of government and community engagement. From these historical examples, today's urban planners and policymakers can learn how to design sustainable and integrated housing solutions for the fast-growing urban areas (UN-Habitat, 2020a).

The Industrial Revolution had a great impact on the development of cities and created both problems and solutions for the housing issue. While it spurred economic growth and technological advancements, it also exposed the vulnerabilities of urban systems in accommodating a growing population. Addressing these challenges required innovative housing solutions and laid the foundation for modern urban planning (UN-Habitat, 2020a).

The Industrial Revolution is considered as one of the most significant events in the history of mankind, which provides a strong base for comparison with the present-day issues especially the relation between urbanization and affordable housing in cities.

2.2.2 Post-War Reconstruction in Developed Countries

The post-war reconstruction period in developed countries can be defined to extensive efforts to rebuild physical infrastructure, revive economies, and restore social stability following major global conflicts. This phase can be characterized by significant political, economic, and social transformations that laid the foundation for modern economic prosperity in many nations. (Engels, 1845)

After the Second World War most of the European countries as well as parts of Asia were destroyed. Cities, industries, and transportation systems were extensively damaged, displacing millions and disrupting economies. Reconstruction efforts focused on rebuilding critical infrastructure, restoring governance, and re-establishing economic stability.

For example, in Germany and Japan, key urban centers such as Berlin, Dresden, and Tokyo were severely bombed, requiring comprehensive rebuilding plans (Judt, 2006). Similarly, countries like the United Kingdom faced challenges in repairing damaged housing, transport networks, and industrial sites.

The next section of this study will explore how developed countries such as Germany, the UK, and Japan addressed their housing crises in the aftermath of the World Wars. By examining the strategies, they implemented to rebuild and provide affordable housing; this research aims to identify lessons that could be adapted to address the housing crisis in Mogadishu, considering their applicability to the local context.

2.2.3 Post-War Reconstruction and Prefabrication Housing in Germany

In the aftermath of World War II, Germany faced a catastrophic housing shortage, with millions of homes destroyed or severely damaged. It has been reported that approximately 20% of all housing units in urban areas were either uninhabitable or destroyed (Diefendorf, 1993a). This housing crisis was exacerbated by the displacement of millions of refugees and the urban population surge, which overwhelmed the existing infrastructure. The scale of devastation necessitated rapid and innovative solutions to provide affordable housing for the growing population

the war left many German cities in ruins, with up to 75% of urban areas destroyed in places like Berlin, Munich, and Hamburg (Diefendorf, 1993). Among those challenges, the shortage of housing was exacerbated by returning soldiers, displaced people, and rapid

urbanization. Figure 2.2 illustrates the extent of urban destruction in post-war Germany, emphasizing the severe housing shortages and the critical need for reconstruction efforts (Wertheimer, 1958).



Figure 2.2: Reconstruction of German Urban Centers Post-WWII, Demonstrating Systematic Rebuilding Strategies (Wertheimer, 1958).

To address this crisis, Germany implemented a multifaceted strategy focused on reconstruction and modernization (Van Hook, 1999). Among those measures, the use of prefabrication techniques emerged as a critical method to accelerate housing production. Prefabrication not only allowed for the mass production of housing units but also ensured cost efficiency and standardization, which were vital given the economic constraints of the post-war period (Diefendorf, 1989).

2.2.3.1 Strategies implemented in reconstruction

Another major strategy that was adopted in the housing sector is the integration of the public and private sectors. The government had the main responsibility of creating housing schemes that focused on the reconstruction of cities and urban areas. For example, the First Housing Law of 1950 offered grants to facilitate the construction of low-income housing by both the public and private sectors (Judt, 2006). It has been suggested that this law provides a foundation for the growth of housing in the subsequent years. For example, Hamburg had guidelines that regulated the reconstruction of the city which focused on the two main goals of speed and low cost (Hajdu, 1979). Also, another of the measures that were put in place includes urban zoning and centralized planning to which help was solving also the introduced housing Hamburg crisis. The city for instance had reconstruction frameworks that emphasized the two main goals of time and money (Hajdu, 1979).

Additionally, zoning and land-use policies were revised to synchronize urban planning and the effective utilization of resources. According to Hajdu (1979) whose research findings indicated that post-war Germany was effective in solving the problem of housing and overall urban development in the long run. This approach was quite useful in the process of neighborhoods, reconstruction of not only houses but also surroundings including.

2.2.3.2 Adoption of Prefabrication Techniques

The use of prefabrication was one of the most effective techniques that were used in this time. Prefabrication involved the manufacturing of housing components and then installing them on the specific site hence reducing the time and the cost of construction (Diefendorf, 1993b).



Figure 2.3: Assembly of Prefabricated Housing Units In Post-War Germany to Accelerate Construction Timelines (Diefendorf, 1993b).

Figure 2.3 highlights the implementation of prefabrication techniques in post-war Germany, showcasing the standardized construction process and its impact on addressing the housing deficit. In post-war Germany, prefabrication played an important role in the housing sector (Diefendorf, 1993b). This approach involved the creation of standard pieces of construction, which were fabricated in 1958. After building this site, the method was then processed and installed. The development became widely used and useful in solving the housing deficit in a shorter time, and the cost became less expensive (Diefendorf, 1993b). According to Wertheimer (1958), the specification of houses was standardized, and this method solved the problem of low housing numbers quickly after the war.

Post-war, the problem was then solved by architecture. For example, concrete panels were taken from factories, providing effective and reliable building materials. These panels were erected on-site, and prefabrication methods were added to estates, showing how prefabrication solved the lack of housing (Wertheimer, 1958). Even though architects found prefabrication aesthetically lacking, in my opinion, this approach had several benefits, such as the integration of modern facilities and communal life. According to Wertheimer (1958), the standardization of houses defined the architecture of the time, with some criticisms regarding the lack of architectural appeal (Wertheimer, 1958). However, prefabricated designs created a sense of belonging for residents, incorporating both traditional and modern construction spaces. (Wertheimer, 1958).

2.2.3.3 Lessons from Germany's approach

The German success in how it dealt with the post-war housing issue can be used as a lesson for present-day housing problems. It is thus possible to conclude that government support in new construction technologies and the overall planning of cities and towns was critical in Germany's capacity to solve the problem. Organizing resources and applying technology in reconstruction is a lesson for other countries with similar concerns (Howell, 1998).

In addition, the focus on prefabrication has impacted housing policies as well as construction practices in the global market. The German example proves that prefabrication is an efficient method for delivering affordable and long-lasting housing, especially in post-disaster situations such as large-scale reconstruction (Howell, 1998).

In conclusion, the policies for reconstruction and housing in post Second World War Germany show how a nation can transform itself from the ruins of war to prosperity with the help of the right policies, planning, and cooperation. The use of prefabrication techniques, together with the presence of favorable government policies and proper planning, helped solve the housing problem and, at the same time, provided a basis for the development of sustainable urban communities. This account is thus useful for the present day, especially in situations where there is a lack of housing due to rapid urbanization.

2.2.4 UK: New Towns and Council Housing in Post-War Reconstruction

The housing crisis in post-war Britain was a major issue, caused by war damage, increased demand for houses, and migration to substantial urban areas (R. Smith, 1974). To meet the housing needs of the people, it has been suggested that the UK government made substantial efforts, especially through New Towns and Council Housing, such as housing with prefabrication technological methods (Council, 2015). These efforts changed the face of urbanization and had a profound impact on the social structure of post-war Britain.

2.2.4.1 The housing crisis and policy responses

The level of destruction in Britain during the Second World War was unprecedented; it left millions of people homeless and the urban infrastructure of the country damaged (R. Smith, 1974). The post-war period can therefore be seen as the government taking steps to address the housing problem and develop it further. One such step was the 1946 New Towns Act, under which new towns were designated to shift the population of overcrowded cities and develop the regions in a balanced manner (Council, 2015). Thus, it is feasible to state that the New Towns policy was one of the most important in the history of urban planning, as it involved the simultaneous attempt at resettlement together with the creation of new neighborhoods.

Furthermore, council housing was also developed as a crucial part of the plan to meet the housing demand, which had become quite keen by then. The burden of providing housing fell heavily on the public sector, which was permanently involved in the process (Mohl, 2001). The government viewed housing as a basic human need and therefore emphasized the provision of adequate shelter for all citizens, including low-income earners.

2.2.4.2 The role of prefabrication

The use of prefabrication techniques was adopted in the post-war period in Britain as a way of addressing the issue of providing massive social housing (Homer, 2001). The conventional construction techniques were inadequate for the demand for houses, especially because of the shortage of labor and resources during that time (Adeyemi et al., 2024). The so-called “prefabs” were temporary structures manufactured in advance at different locations and then coupled together to provide a solution to the housing shortage (Smith, 1974). Figure 2.4 illustrates the design and features of the Arcon Mark IV prefabricated bungalows, highlighting their role in addressing post-war housing needs and their impact on industrialized housing production.

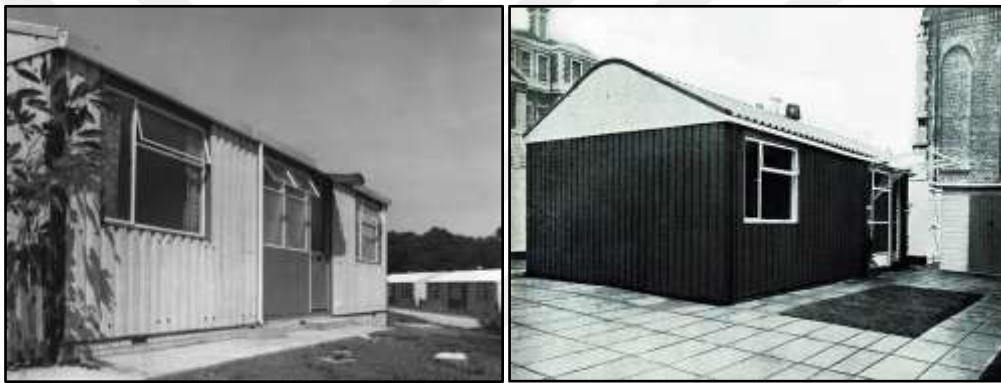


Figure 2.4: The Arcon Temporary Bungalow (Nonstandard house, 2022).

It has been observed that these houses were instrumental in addressing immediate housing needs, offering functional and cost-effective solutions (Homer, 2001). For example, prefabs such as the iconic Arcon Mark IV bungalows provided modern amenities like indoor bathrooms and kitchens, which were previously unavailable to many working-class families. However, criticisms emerged regarding their durability and aesthetic appeal (Smith, 1974). Despite these limitations, prefabrication demonstrated the potential for industrialized housing production, influencing future construction practices in the UK and beyond.

2.2.4.3 Achievements and challenges of new towns

The New Towns initiative sought to alleviate overcrowding in existing urban centers while fostering self-contained communities. (Ward, 2022) These towns, such as Stevenage and Milton Keynes, were meticulously planned to include residential, commercial, and recreational spaces (Judt, 2006). As shown in Figure 2.5, Stevenage's layout incorporated green spaces and pedestrian-friendly zones, reflecting a vision of modernity that prioritized quality of life.

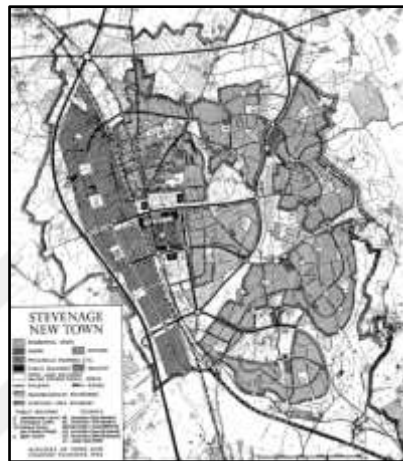


Figure 2.5: Stevenage New Town Layout (Council, 2015).

Among those who studied these developments, some emphasized their role in promoting economic regeneration and regional balance (Simmonds, 2001). It is possible to argue that New Towns not only addressed housing shortages but also reshaped urban living standards.

However, challenges emerged in maintaining the social and economic cohesion of these towns. While the infrastructure was modern, issues such as social isolation and the lack of employment opportunities persisted. Simmonds (2001) stated that integrating these new communities with the existing urban fabric required sustained investment and planning.

2.2.4.4 Council housing: a pillar of social equity

Council housing became a symbol of the welfare state, reflecting the government's commitment to social equity and urban renewal (Council, 2015). The post-war era saw the construction of iconic council estates, such as the Alton Estate in London, which embodied the principles of modernist architecture (Homer, 2000). Figure 2.6 shows the innovative design of the Alton Estate, which combined high-rise and low-rise buildings to maximize space utilization while providing open areas for residents.



Figure 2.6: Alton Estate, London (Homer, 2000).

According to Mohl (2001), these estates were meant to offer relatively large, cheap, and brightly lit houses, which included provisions for common facilities. However, when the common areas were not maintained and the economy did not grow in later decades, council estates became viewed in a negative light (Smith, 1974). However, it is important to note that these schemes were effective in meeting the demand for housing and have paved the way for public housing schemes across the world.

The UK's post-war housing plan, which encompassed new towns and council housing, can be considered one of the success stories of the period. The use of prefabrication techniques in the post-war period showed advancements in planning and social housing construction while underlining the need for a focus on social justice in housing (Smith, 1974). However, recent research indicates that these initiatives have faced long-term difficulties with social inclusion and economic viability. Nevertheless, the lesson of this period remains relevant to current debates on housing and urban regeneration.

2.2.5 Japan: Post-War Modular Housing Solutions

Before delving into the historical evolution of Tokyo's integrated development model, it is useful to consider how transportation and housing markets have long influenced one another in the city. Over time, these intertwined sectors have not only shaped urban form but also facilitated innovative solutions to rapidly evolving demographic and infrastructural challenges.

In Tokyo, development from the city center to the surrounding areas has been questioned since the 1923 Kanto earthquake.

In the first stage, some of the income from housing sales was given to transportation companies. With this support, companies strengthened the transportation infrastructure. The financial support helped in the expansion from the city center to surrounding areas, this has been pragmatic in response to the challenges that come with rapid urbanization following the disaster, and the infrastructural challenges that come with it (Yajima & Ieda, 2019).

In the second stage, transportation companies started housing construction. Thanks to the support, cheap housing was sold to low-income people. In addition, many functions were created around the train stations, not just housing. Thus, his integrated approach not only alleviated housing shortages but a solution was produced for the housing need and train stations were made more effective (Yajima & Ieda, 2019).

Japan has suffered major losses in terms of both human and material resources as a result of the Second World War. In the immediate aftermath of the war, Japan was in an extremely difficult situation. The industrial capacity was just about 10% of its 1930 level in 1945 (Sorensen, 2002). The majority of Japanese cities were in ruins at the end of the war. There were serious food shortages throughout the country, and many people were in danger of going hungry. Homelessness was pervasive and more than one-sixth of the country's dwellings had been destroyed (Forrest, 2021). By 1945, over 63,000 hectares across 115 cities were in ruins, with 2.3 million homes destroyed due to bombings and fires during World War II (Ronald & Druță, 2016). Over 30% of urban areas were devastated, with many cities experiencing destruction levels exceeding 50% (Zhang, 2017).

Major cities such as Tokyo, Hiroshima, and Nagasaki were heavily bombed, with some cities experiencing destruction levels exceeding 50% of their housing stock (Zhang, 2017). The return of soldiers and colonizers after the war added to the housing demand, creating a shortage of approximately 4.2 million homes (Zhang, 2017). Overcrowding became common, with multiple families sharing small, makeshift shelters or temporary housing (Ronald & Druță, 2016). Also, Japan's economy was unsteady, with critical shortages of building materials, skilled labor, and financial resources. Most homes constructed immediately after the war were self-built, using salvaged war materials such as wooden debris and metal scraps (Zhang, 2017). The Japanese government implemented a series of innovative modular housing solutions to address the crisis.

These strategies and methodologies not only provided immediate relief but also laid the groundwork for Japan's long-term success in modular housing development (Ronald & Druță, 2016).

2.2.5.1 Strategies implemented

The post-war recovery was succeeded by nearly two decades of rapid economic expansion. Japan's economy grew remarkably quickly between the middle of the 1950s and 1973, with an average yearly increase in GDP of up to 10%. It would be impossible to understand the economic miracle without mentioning Japan's economic administration (Johnson, 1982). Japan's post-war housing strategy centered on prefabrication and industrialized construction methods. Initially, self-built housing dominated due to limited resources and economic instability (Ronald & Druță, 2016). During the immediate post-war years, the government prioritized rebuilding industrial capacity over housing development. This decision delayed systematic efforts to address the housing crisis until the early 1950s (Ronald & Druță, 2016). However, In order to establish post-war housing rebuilding, the central government developed housing policies. The Government Housing Loan Corporation (GHLC) Act of 1950, the Public Housing Act of 1951, and the Japan Housing Corporation (JHC) Act of 1955 established the so-called "three pillars" of post-war housing policy (Zhang, 2017). However, as Japan's economy stabilized in the 1950s, the government took these key strategies Housing Loan Corporation (1950): The establishment of this organization provided low-interest loans to families, encouraging home-ownership and stimulating private sector participation in housing production (Zhang, 2017).

Collaboration with Private Industry: Major manufacturers like Daiwa House and Sekisui House emerged in the 1950s and 1960s, leveraging their industrial expertise to create prefabricated housing solutions. Daiwa House's "Pipe House" model, for example, offered an affordable, durable, and rapidly deployable housing option (Ronald & Druța, 2016). Introduced in 1955, it used steel pipe frameworks, ensuring resilience against natural disasters such as earthquakes and typhoons (Zhang, 2017).

Government Support and Incentives: The government launched initiatives like the House 55 Development Competition to foster innovation in modular housing design and production (Ronald & Druța, 2016). However, these competitions showcased advanced models such as Misawa Homes' "Home Core," which combined functionality with cost-efficiency (Zhang, 2017).

2.2.5.2 Methods employed

Japan relied heavily on prefabricated housing systems to address the housing deficit efficiently. This method involved factory-made components assembled on-site, reducing construction time and labor requirements. Prefabrication played a pivotal role in Japan's ability to meet housing demands. Early innovations included:

PREMOS System: Developed by Kunio Maekawa, this system utilized mass production techniques inspired by Fordism to deliver standardized housing units quickly and affordably (Ronald & Druța, 2016).

Steel-Framed Structures: Japan used modern materials like lightweight steel, concrete panels, and prefabricated wooden frames. These materials facilitated quicker construction and improved the structural integrity of houses. Models like Daiwa's "Pipe House" employed steel frameworks that were cost-effective and resilient to natural disasters such as earthquakes and typhoons (Zhang, 2017). Figure 2.7 showcases Japan's innovative prefabricated housing systems, emphasizing the PREMOS system and steel-framed structures that revolutionized post-war housing solutions.

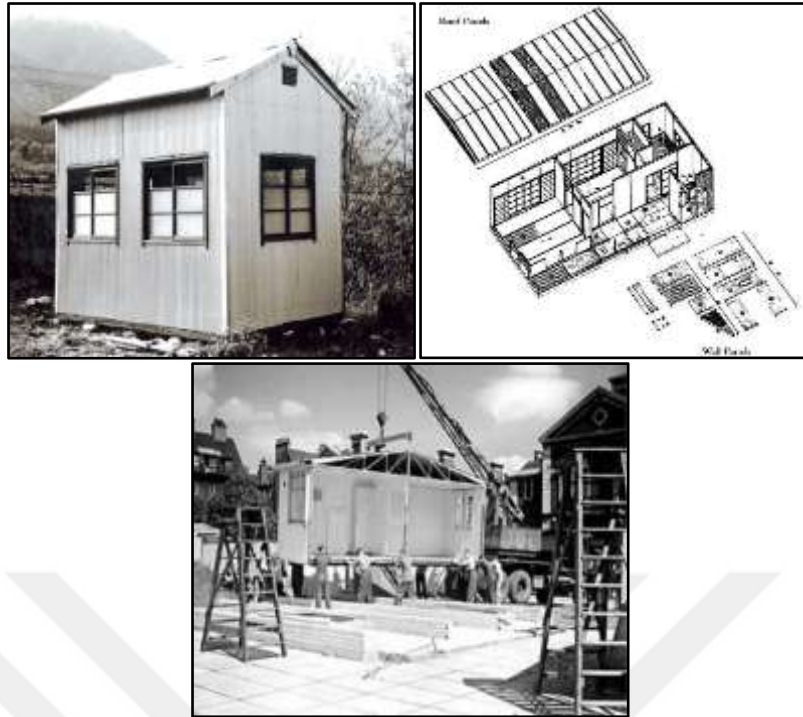


Figure 2.7: Daiwa's 'Pipe House' was a Compact Shed Composed by a Pipe Steel Frame Structure Covered with Corrugated Steel Sheets, (Jimenez-Moreno, 2017).

Mass Customization: By the 1970s, manufacturers shifted toward customizable prefabricated homes, aligning with evolving consumer preferences while maintaining affordability and efficiency (Ronald & Druța, 2016).

Japan's modular housing strategies following World War II highlight the importance of innovative approaches in overcoming housing crises (Jimenez-Moreno, 2017). By focusing on prefabrication, public-private collaboration, and phased development, Japan transformed its housing sector into a global model of efficiency and resilience. Applying these lessons to Mogadishu's context could play a crucial role in addressing its affordable housing challenges.

2.3 APPLYING HISTORICAL LESSONS TO AFFORDABLE HOUSING IN MOGADISHU

Studying the historical of affordable housing can give important lessons that can be used in solving the housing problem in Mogadishu. The success of large-scale public housing projects in post-war Germany and the UK showed that the government had a role to play in providing homes. As for Japan, the use of prefabrication and modular housing after the Second World War was also a quick and cheap solution for the housing problem. In

Mogadishu, the government and private sector could work on the production of prefabricated houses using local materials to make the houses affordable and sustainable. Also, planned urban expansion with necessary infrastructure such as sanitation and transport would improve the sustainability of these projects in the long run.

The participatory housing models that have been used in cooperative housing projects all over the world could also be adopted in Mogadishu to ensure that the new housing developments are suitable for the cultural and social structure of the people of Mogadishu. Mixed-income housing strategies would prevent socio-economic segregation and would help in fostering economic mobility within the communities. Microfinance loans and government subsidies could help improve access to housing for low-income families. Mogadishu can develop a resilient, scalable, community focused, affordable housing framework that will support long-term urban stability and growth if these historically proven strategies are combined with local strategies.

Based on the historical evidence, the current global housing strategies embrace new technology, sustainable design, and inclusive policy making. Around the world, governments, private developers, and non-governmental organizations have implemented diverse approaches to mitigate housing shortages and improve affordability. The next section explores these global strategies, assessing their effectiveness and adaptability to various contexts, including the ongoing challenges in Mogadishu.

2.4 GLOBAL AFFORDABLE HOUSING STRATEGIES

Throughout the world, rising housing costs are negatively impacting people's wellbeing and escalating disappointment and anger. For young families and renters who are new to the housing market and did not profit from previous gains in property values, this is particularly true. Since there are many different causes of the global housing affordability problem, different approaches will inevitably be needed to find answers. According to (Saiz, 2023) in his paper he mentions there are five primary theories explaining the causes of these phenomena. First, rising inequality in income in many nations is proof that middle-class and low-income people's wealth has not increased (Alvaredo et al., 2018). This issue could argue for more extensive redistributive and educational policies, and it is not always related to inefficiencies in the housing market (Glaeser and Gyourko, 2017).

Secondly, automation, information technology, and enhanced global supply chains have expedited the productivity growth of manufactured marketable items in comparison to services and non-tradable. Real estate is the ultimate non-tradable good (Saiz, 2023). Therefore, the rising expenditure shares on housing consumption may be partially caused by a form of "cost disease" (Baumol, 1993) (Albouy et al., 2016). Additionally, several well-known cities have seen construction expenses rise above the national average (e.g., Gyourko, 2017 and Saiz, 2003).

Thirdly, some of the most popular cities with better amenities, access to education, and high skill better-paying jobs have disproportionately attracted residential demand (Glaeser et al., 2001; Glaeser and Saiz, 2004). Several of them are in coastal or mountainous regions, which limit their potential for geographic expansion (Saiz, 2023). The high income-elasticity of demand for amenities, together with the fact that they grow endogenously in attractive areas (Guerrieri et al., 2013), generates a virtuous cycle of ever-increasing concentration of housing demand.

Fourth, as civilizations around the world mature, not-in-my-backyard (NIMBY) anti-development pressures have increased. Building new homes at high densities is extremely challenging due to increasingly stringent municipal laws and regulations. Land values have been rising in desirable places, making it nearly hard to construct modest-quality homes these days (Saiz, 2023).

Fifth, in the absence of better options, a global savings surplus may have lowered mortgage rates and increased the desire of an expanding number of international investors to purchase real estate (Badarinza and Ramadorai, 2018). There is compelling evidence from around the world that loan expansion tends to drive the growth of house prices (Cerutti et al. 2017).

Addressing housing affordability problems needs a synthesis of economic growth, local entrepreneurship, and improved family agency. Policies at the local and federal levels are essential for empowering communities, families, and moral real estate developers. Institutions at the municipal and governmental levels that equitably transfer resources are also required to balance purchasing power.

They're 1.6 billion people worldwide living in inadequate conditions, many due to a lack of affordability in the market (UN-Habitat, 2020b). The global housing crisis can be considered as one of the most pressing challenges of the 21st century, with profound implications for societal well-being, economic stability, and environmental sustainability. The rapid process of urbanization and increase of population coupled with economic inequalities has put enormous pressure on housing systems worldwide. In addition, the frequency and severity of climate related disasters have been on the rise because of global warming which is a result of human activities and therefore it is crucial for identifying and addressing the challenges that affect the quality of life of residents in social housing communities. However, the problem of affordable housing is not new and is a complex global issue that has been exacerbated by economic, social, and political factors.

2.4.1 Strategies for Affordable Housing

Apart from the widespread belief that housing is a commodity rather than a right, there are some of the various factors that affect housing costs such as Land and infrastructure expenses, building standards and regulations, design and construction costs (including labor and materials), supply and demand relationships, and maintenance costs (including repair and operating costs like heating) (Hartl, 2018; Jocher, 2018; WEF, 2019).



Figure 2.8: Strategic Phases of Affordable Housing Supply (Gökçe, 2022).

Figure 2.8 highlights the interconnected phases of affordable housing development, illustrating how design, funding, policymaking, and construction collectively contribute to achieving affordability. Therefore, a variety of approaches are needed in the phases of affordable housing design, funding, policymaking, and construction to achieve housing affordability. Some of these strategies will be discussed in the next section.

2.4.1.1 Government policies

Government policies are the most significant factors that influence the supply of housing and its affordability (UN-Habitat, 2020b). The following urbanization and the economic policy forces that lead to even higher demand are crucial for low-cost affordable housing (World Bank, 2018). Here are some government policies.

a. Housing policies

In this regard, a proper housing policy that manages the national housing or sector local in level and organized in a manner in conformity with other affordable housing strategies is considered vital (Steiner, 2018). Additionally, minimizing bureaucracy and speeding up the project approval process are also important since they drive up housing costs as well (Schuetz & Meltzer, 2012). Housing policies must also consider the flexibility of structures to allow for incremental building, which can be essential for affordability in low-income communities in developing countries. These policies ensure that housing solutions align with the socio-economic realities of the targeted populations (Greene & Gonzalez, 2019).

b. Land policies

A well-thought-out urban land policy that limits land price increases is crucial for housing affordability, “since the actual cost driver for housing is not the high building standards, but the price of land” (Jocher, 2018, p. 16). For example, since 1891, the city of Ulm has had a land policy that keeps speculators away from construction land (Geiser, 1912; Jocher, 2018): by purchasing additional plots (i.e., public ownership) “the city itself controls the development and free-space reservation of its land areas” (Jocher, 2018, p. 17).

Furthermore, the supply and cost of affordable housing are significantly impacted by zoning and land-use rules (WEF, 2019). Outdated land-use regulations and zoning limitations, such as exclusionary zoning, can reduce the availability of homes and raise housing costs. Therefore, “innovative zoning and land-use reforms” are important for the availability of affordable housing (Schuetz & Meltzer, 2012). For example, the city of Minneapolis eliminated its outdated single family zoning rule in order to boost density, promote development in the housing supply, and lower housing costs (Schuetz & Meltzer, 2012). In the same way, the city of San Jose established a new “co-living” zoning code, by

working with the developers, the 800 residential units and shared facilities in the Scarcity project will be realized (E., Jaffe & Quirk, 2019).

One of the zoning methods used to promote affordable housing is “mandatory inclusionary zoning, which requires developers to set aside a share of apartments that are affordable to households at different income bands” (Schuetz & Meltzer, 2012). Another approach is transiting oriented development (TOD), which promotes the availability of inexpensive housing close to transit regions and upgrades urban transportation infrastructure (WEF, 2019). For example, TOD along with mandatory inclusionary zoning is used to ensure affordability for people who access mass transit (Schuetz & Meltzer, 2012). The Los Angeles County Metropolitan Transportation Authority put into effect a policy that mandates “that 35 percent of all housing built on its land must be affordable to households earning less than 60 percent of the area’s median income” (Riggs, 2018, as cited in WEF, 16 2019). Rewarded inclusionary zoning is an alternative to mandated inclusionary zoning where developers receive rewards for constructing affordable units, such as accelerated approval, density bonuses, and loosened parking requirements (WEF, 2019). For example, density bonuses are offered by Arlington County and the city of Austin. Which incentivizes the production of affordable housing in exchange for increases in allowable building heights (Schuetz & Meltzer, 2012)? This can be improved by rewarding housing developments based on their contributions to the community, closeness to employment, and availability of essential amenities (Crichton, 2018). At the same time, inclusionary zoning policies promote social cohesiveness and variation.

Another approach is prioritizing the construction of affordable housing while disposing of “surplus public land” (Schuetz & Meltzer, 2012). Additionally, increasing the number of dwelling units on underutilized land might raise the affordability of housing. In 2016, an investigation revealed that 28 percent of parcels zoned for multifamily development in Los Angeles were underused and could add more than 300,000 units to the city’s housing inventory (Boudreaux, 2011). This as well applies for properties and undeveloped land. This can be addressed by expropriating vacant or unsafe dwellings for social housing projects and enacting vacancy taxes to promote residential development on vacant lands (WEF, 2019). Similarly, it might be advantageous to use conversion regulations to turn offices, shops, and hotels into affordable housing (WEF, 2019).

Therefore, by limiting urban expansion and “encouraging the use of mass transit, walking and cycling” these zoning and land-use policies not only contribute to more affordable housing but also promote sustainable urbanization (WEF, 2019).

c. Funding

Programs for collective and contractual savings, such as housing provident funds, can help purchasers save money for down payments and provide participants with low-interest mortgages (Woetzel et al., 2014). In addition to financial support from “private-equity funds, insurance companies, pension funds, banks, development finance institutions and wholesale debt markets” (WEF, 2019, p. 25). The government's participation in starting affordable housing initiatives and providing money at the municipal and national levels is also crucial. Governments might provide funds or tax breaks to interested parties (such as nonprofit and for-profit developers) to encourage their participation in the construction of affordable housing (WEF, 2019). They can also serve as guarantors for small and charitable organizations and provide developers with inexpensive loan rates. For example, developers are permitted to make a limited profit from housing development under Vienna's Limited Profit Housing Act, but they are also given incentives such as a low interest rate of 1% for 30 years (Maschaykh, 2015). Similarly, real estate developers can receive tax benefits for their investments in designated low-income areas under the United States' Investing in Opportunity Act “opportunity zones” (Bertoni, 2018).

Rental support provided by national or local governments is an additional source of finance that “allows developers to serve lower-income renters while still ensuring necessary revenue to operate the property and pay debt service” (Blumenthal et al., 2016). In a similar way, government guaranteed tenants or purchasers of completed units might lower developers' financing costs and speed up the acquisition of investments or loans for the project, making affordable housing initiatives less problematic (Woetzel et al., 2014).

Employers, in addition to governments, can contribute to the construction of affordable housing. For example, businesses like Google, Facebook, Ikea (in Reykjavik), and Lego (in Billund) are building reasonably priced housing for their staff members (Forrest, 2021).

2.4.1.2 Design considerations

Designing affordable housing requires careful consideration beyond just construction strategies; thoughtful design decisions are essential to ensure long-term affordability and livability (Emekci, 2021). Choices made during the design phase can significantly impact the ongoing costs of maintaining a home. For example, opting for low-cost materials may help reduce the initial price of the house, but if these materials are of poor quality, they could lead to higher expenses in the future, such as increased utility bills and maintenance costs (Emekci, 2021). Thus, balancing upfront affordability with long-term sustainability is crucial in designing housing that truly serves its residents' needs.

a. Space optimization

Micro residences with built-in wall cabinets and foldable beds that have a floor size of roughly 10 m² are becoming more and more common in Asia's major cities (Jocher, 2018). Following guidance from Existenzminimum,, In addition to lowering housing expenses, the idea of small, compact residential units that have smaller floor areas can also result in reduced utility expenses because smaller spaces require less energy for heating and cooling. Utilizing flexible, multifunctional spaces can further enhance efficiency by adapting to residents' shifting needs throughout the day, enabling spaces for sleeping, dining, and working without excessive area allocation (Jocher, 2018).

Innovative design solutions, such as the Ori Studio Suite, integrate multiple functions into small spaces by combining storage, sleeping, and work areas within a single unit (Jocher, 2018). Reducing circulation spaces and focusing on open-plan layouts allow designers to fit more units within a building, thereby maximizing occupancy and cost efficiency (Hartl, 2018). Additionally, incorporating shared facilities like communal kitchens or laundry rooms reduces the need for private kitchens and laundry areas in each unit, freeing up space for other functions. Semiprivate and communal areas, such as rooftop gardens or dining halls, foster social interactions, helping to build community ties and improve resident's quality of life (E. Jaffe & Quirk, 2019).

b. Sustainable and creative solutions

Sustainable design plays a key role in creating long-lasting, cost-effective housing. Following the passivhaus principles designing energy efficiency and decreasing the use of

artificial heating and cooling systems can significantly lower utility costs while enhancing durability and improving residents' health using non-toxic products and the enhancement of indoor air quality (Bradshaw et al., 2005; Emekci, 2021). Utilizing low-carbon products that are supplied locally not only supports environmental goals but also cuts costs associated with transportation.

Creatively interpreting building regulations can further drive down construction costs. For example, removing parking spaces in favor of promoting public transportation and car-sharing programs helps reduce expenses related to parking infrastructure. In Melbourne's Commons affordable housing project, this approach saved AUD 750,000 by constructing bike parking instead of a car park, owing to its location near public transit (McLeod, 2015). Additional savings of AUD 200,000 were achieved by eliminating unnecessary second bathrooms and another AUD 200,000 by designing for passive heating and cooling instead of installing air conditioning units (McLeod, 2015). These minor adjustments, such as leaving concrete surfaces unfinished and reducing the use of high-carbon materials like ceramic tiles and chrome-plated fixtures, collectively contributed to a total savings of AUD 1.3 million (McLeod, 2015).

2.4.1.3 Construction Strategies

Structural and labor costs account for about half of the overall building costs. "Comprise approximately 45 percent of construction costs in highly developed industrialized countries" (Hartl, 2018, p.31). In 2015, a commission established in Berlin to lower most of the construction costs, according to this data, is caused by building installations, also known as cost group 400, which includes sanitary and electrical installations as well as mechanical ventilation systems. (Hartl, 2018)

Furthermore, choosing "thin external walls with several highly specialized layers" to provide insulation over "massive, simple, monolithic components" helps to explain this rise (Jocher, 2018, p. 16). Therefore, using simple cost-effective insulation components in addition to "well-planned and short installation conduits as well as the bundling of wet zones" can assist in reducing the expenses (Hartl, 2018, p. 31). Additionally, this simplicity can be achieved during the construction phase by ignoring complex construction

techniques, simplifying building components and load-bearing systems, and choosing tactics that can boost construction efficiency and save expenses (Hartl, 2018).

a. Prefabrication

Prefabrication is one of the most efficient construction techniques for the supply of affordable housing. Precast concrete and prefabricated mass timber (such as cross-laminated timber) are two examples of construction materials that can help and Housing can be constructed “efficiently in terms of time, materials, and costs” (Pawlitschko, 2018, p. 21). Stated differently, “factory-based construction” where building components are produced off-site and then assembled on-site can enable the construction of more buildings more rapidly while “improving cost predictability” (Jaffe, 2019; Jaffe & Quirk, 2019). Additionally, prefabrication enables shorter timeframes for cranes, construction equipment, and scaffoldings to be used on the construction site, as well as faster assembly times and improved amenities. However, it also lessens the impact of noise, dust, and delivery traffic on the residential environment (Pawlitschko, 2018)

With faster construction speeds, “developers can recover their investments more quickly, reduce exposure to interest rate changes, and potentially complete more projects over the same time period” (E., Jaffe & Quirk, 2019). This can have a favorable impact on property values. Therefore, Prefabrication can result in greater savings for both developers and residents (E., Jaffe & Quirk, 2019). According to Sidewalk Labs, its mass timber factory-based construction method, which is being suggested for the city of Toronto, can decrease waste by 75%, speed up the construction process by 35%, and lower project costs by 20% “if a construction factory runs at its peak efficiency” (E., Jaffe & Quirk, 2019). Timber is a sustainable building resource because of its ability to store carbon, low carbon footprint, and renewable qualities, in addition to its light weight and earthquake resistance (Pawlitschko, 2018). In order to encourage the use of cross-laminated timber (CLT) in construction, several nations have changed their building codes (WEF, 2019). In figure 2.9 shows Renovation of the façade of buildings G, H and I in the Grand Parc district of Bordeaux by Location-Vassal.

Similarly, there are recommendations for providing incentives to support the construction of inexpensive mass timber housing in the city of Los Angeles (Central City Association of Los Angeles, 2019).

Existing residential buildings can also be transformed using prefabrication. The Tour Bois le Prêtre social housing was redesigned in 2011 by French architects Anne Lacaton, Jean-Philippe Vassal, and Frédéric Druot. They used prefabricated elements to increase the daylight level, create balconies, and extend the living areas with winter gardens while the residents remained in their apartments (Frearson, 2013; Jocher, 2018).

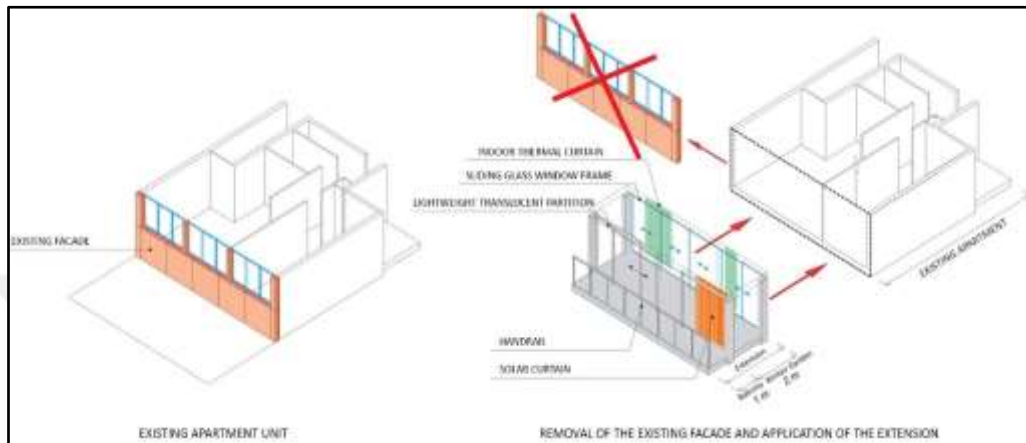


Figure 2.9: Renovation of the Façade of Buildings G, H and I In the Grand Parc District of Bordeaux by Lacaton-Vassal (Onyszkiewicz & Sadowski, 2022).

b. Modular construction

Modular construction involves creating standardized, self-contained units (modules) that can be combined in various configurations to create complete buildings. This approach allows for flexibility in design, as modules can be rearranged, added, or removed to accommodate different space and functional requirements (R. E. Smith, 2010). For affordable housing, modular construction provides a cost-effective and flexible solution, as it enables developers to scale up or down based on budget constraints and community needs.

Modular construction is a “special type of prefabrication where not only individual elements, but entire spatial units are manufactured and transported to the building site” (Pawlitschko, 2018). This approach is particularly useful for repeated residential units to reduce building times and costs since modules—which include structural elements, windows, doors, furnishings, and technical installations—are typically layered on top of one another (Pawlitschko, 2018). For example, modular construction was the main construction style used in the Architects' Carmel Place affordable housing project, which

was completed because of a competition hosted by the city of New York (Jaffe & Quirk, 2019). The project also had an impact on New York City's zoning laws because it was Manhattan's first micro unit apartment complex, with 55 apartments ranging in size from 24 to 33 m². Following its completion, the city made zoning rule revisions to encourage modular building and increase the availability of micro unit housing (nArchitects, n.d.).



Figure 2.10: Stacking of the Modular Units (LILAC, 2019).

c. Automated procedures

In addition to bricklaying robots, research is being done on the efficiency of using robotic systems to produce reinforced concrete walls and timber components on their own (Pawlitschko, 2018). Additionally, the building technology business ICON 3D-printed a 46 m² home in 24 hours for 4,000 USD by working with the nonprofit group New Story and social housing developer ÉCHALE, opening the door for the creation of the first 3D-printed community for low-income families in the world in Mexico (Boissonneault, 2019; ICON Team, 2019). Even while automated production is a relatively new concept in the building industry and hasn't been used outside of a few projects, it could eventually result in more affordable houses.

3D printing, for instance, has been successfully implemented in several pilot projects around the world, including the New Story project in Mexico, where 3D-printed homes are constructed in less than 24 hours and cost significantly less than traditional homes (Boissonneault, 2019; ICON Team, 2019). This technology not only reduces construction timelines but also has the potential to adapt to local materials, which can further reduce costs and support sustainability goals (Boissonneault, 2019; ICON Team, 2019). The adoption of automated procedures, however, remains limited in many developing countries

due to high initial investment costs and the need for skilled labor to operate advanced machinery (UN-Habitat, 2019).

This Chapter provides a detailed exploration of the conceptual foundations of affordable housing, focusing on global definitions, historical contexts, and strategies for addressing housing affordability. This chapter serves as a vital theoretical foundation for the thesis, emphasizing the multi-dimensional nature of affordability and its significance as a global challenge. Through its comprehensive analysis, Chapter 2 successfully highlights the interplay between socio-economic, cultural, and environmental factors in shaping housing affordability.

A significant strength of this chapter is its in-depth examination of the historical evolution of affordable housing, which traces key milestones such as the Industrial Revolution and post-war reconstruction efforts in countries like Germany, the UK, and Japan. The chapter discusses how industrial urbanization created unprecedented housing demands and how prefabrication and modular construction techniques emerged as effective responses (Clark, 2013; Diefendorf, 1993b). These historical lessons provide valuable insights into the development of modern housing solutions, particularly their relevance in addressing rapid urbanization and resource constraints in developing contexts.

Building on its historical analysis, the chapter examines global strategies for affordable housing, including government policies, design innovations, and cost-effective construction methods offers a holistic understanding of how different regions have tackled similar challenges (UN-Habitat, 2020a; Maschaykh, 2015). Notable examples include the use of land-use policies, inclusionary zoning, and prefabrication techniques, which have demonstrated success in improving housing affordability while ensuring environmental sustainability (Schuetz & Meltzer, 2012). These strategies underscore the importance of integrating policy frameworks with innovative design and construction approaches.

Another key contribution of this chapter is its critical engagement with various definitions and metrics of affordability. By exploring parameters such as the "30% rule" socio-economic indicators, and multi-dimensional approaches, the chapter highlights the nuanced nature of affordability (UNECE, 2015). It emphasizes that affordability extends beyond

financial considerations to include access to essential services, infrastructure, and cultural relevance (UN-Habitat, 2020b).

The importance of this chapter lies in its ability to provide valuable lessons from historical and global strategies for addressing affordable housing crises. By understanding how different societies have navigated similar challenges, this chapter offers insights that are directly applicable to the development of tailored solutions for Mogadishu. For example, the exploration of prefabrication and modular construction techniques, alongside effective policy interventions, serves as a critical foundation for addressing the housing needs of low-income communities in Mogadishu. These strategies demonstrate how affordability challenges can be met with innovative and sustainable approaches, creating a pathway for achieving inclusive urban development in resource-constrained contexts.

As explored in Chapter 2, the global discourse on affordable housing reveals a diverse range of strategies, innovations, and lessons shaped by historical, socio-economic, and environmental contexts. These conceptual foundations underscore the critical role of policy frameworks, sustainable design, and construction innovations in addressing housing challenges worldwide. However, the application of these strategies is far from universal, requiring adaptation to the unique circumstances of each locale.

Having established these global principles, the thesis now focuses into Mogadishu, where the interplay of rapid urbanization, socio-economic fragility, and cultural dynamics tests the adaptability of these strategies, the focus shifts from the global perspective to the specific challenges in Mogadishu, Somalia. By contextualizing the insights from global practices within Mogadishu's urban landscape, this chapter bridges theory and practice. It examines how the city's distinctive socio-economic conditions, rapid urbanization, and cultural fabric shape the dynamics of affordable housing. This localized analysis not only highlights the pressing needs of Mogadishu's low-income communities but also identifies the potential for tailored solutions grounded in the global principles discussed earlier.

Through this lens, Chapter 3 delves deeper into Mogadishu's housing landscape, providing a foundation for the subsequent case study analyses that inform practical, actionable strategies for the city.

3. CONTEXTUAL ANALYSIS OF AFFORDABLE HOUSING IN MOGADISHU

In this chapter, the thesis explores the specific context of Mogadishu, Somalia, establishing a crucial link between global architectural discourse and the unique challenges faced by the city. The transition from theoretical frameworks to localized analysis is essential for translating broad concepts into practical, context sensitive solutions. By examining Mogadishu's distinct characteristics including its diverse housing typologies, prevalent land tenure issues, and the widespread presence of informal settlements this chapter provides a comprehensive contextual analysis that anchors the study in the city's socio-economic and infrastructural realities.

The chapter further explores how these challenges in Mogadishu intersect with broader themes such as urban resilience, social equity, and sustainable development. Within this framework, the study underscores the importance of addressing the pressing housing needs of the city's low-income communities, which remain a central concern amidst rapid urbanization and limited resources. By contextualizing these issues within global strategies for sustainable development, the chapter highlights potential pathways for leveraging international best practices while adapting them to the specificities of Mogadishu's urban fabric.

Through this localized lens, it not only illustrates the critical housing deficit but also identifies potential opportunities for integrating global solutions with local realities. In doing so, it lays the foundation for the subsequent case study analyses, which will focus on exploring actionable, contextually relevant strategies that align with both global principles of sustainability and the unique challenges of Mogadishu.

One of the best examples of an East African developing cities is Mogadishu, which has endured decades of social and economic instability as well as environmental problems. The city is plagued by numerous problems, including food shortage, migration, poverty, violence, insecurity, and conflicts (Bonnet et al., 2020). A civil war also raged in the Somali capital, creating an unstable political environment marked by terrorism and an unfinished constitutional transition. Furthermore, the Covid-19 epidemic decreased the economy by 1.5% in 2020, according to the World Bank, due to the livestock industry—which accounts for at least 40% of the nation's GDP being particularly hard damaged

(Hujale and Davies 2021). Even while housing is a crucial service in this fragile situation, not everyone now has access to it. The majority of people with low incomes, including those who have been displaced, lack access to this essential right.

3.1 REVIEW OF AFFORDABLE HOUSING NEEDS IN MOGADISHU'S URBAN CONTEXT

Mogadishu's affordable housing needs are shaped by a combination of socio-economic, demographic, and environmental factors. The city has also experienced a significant increase in population as a result of both natural growth and an influx of displaced populations and diaspora returnees seeking stability and economic opportunities. This rapid urbanization has led to a supply gap in the housing market which has adversely affected the low-income earners in society and is unable to afford decent houses (Bonnet et al., 2020).

According to UN-Habitat, more than 40% of Mogadishu's population resides in informal settlements with poor hygiene, over-crowding and almost no access to basic services (UN-Habitat, 2020a). These informal settlements are evidence of the failure of the formal housing market where high prices, limited funding sources and absence of affordable rental housing leads to homelessness among low-income populations. Furthermore, problems arise with housing with agenda land where tenure is many, and the low-income uncontrolled earner property struggles in the market to also acquire the legal documentation achievement for their residence (Habitat for Humanity, 2016).

Economic constraints worsen the housing needs in Mogadishu due to high levels of poverty and unemployment rates which reduce the affordability. Many locals have incomes that fall below the poverty threshold and struggle to cover the costs of housing accommodations (World Bank, 2018). Furthermore, while diaspora remittances can be seen as a form of financial support for many families, it also contributes to inflation when it comes to the housing market thus increasing the house prices and making them unaffordable to many who cannot get their hands on such money (IIED, 2016).

In this context, it can be stated that the problem of providing affordable housing requires government interference and the cooperation of public and private sectors. Mogadishu requires a coordinated housing policy that addresses the unique needs of its low-income

urban residents while encouraging affordable housing development. Strategies such as subsidized land allocation, incentives for low-cost housing developers, and improved infrastructure for informal settlements could help bridge the housing gap (Bellini et al., 2022).

3.2 MOGADISHU'S GEOGRAPHICAL AND SOCIOECONOMIC CONTEXT

Mogadishu, the capital of Somalia, is located along the Indian Ocean coast in the Banaadir region of southeastern Somalia. This city holds a complex administrative structure, subdivided into 18 districts such as Abdiiaziz, Bondhere, and Hamar-Jajab, with further subdivisions into waah (departments), laan (sections), and neighborhoods, each influenced by varying clan control (Bellini et al., 2022). Historically, Mogadishu originated as the ancient city state of Sarapion, a hub for traders and navigators, serving as a crucial point along the Indian Ocean trade routes since at least the first century AD, as recorded in Greek travel documents like the Periplus of the Erythraean Sea (Bellini et al., 2022). Figure 2.13 maps Mogadishu's zoning along the Indian Ocean coast and its administrative subdivisions, highlighting the city's historical and strategic importance as a hub for trade.

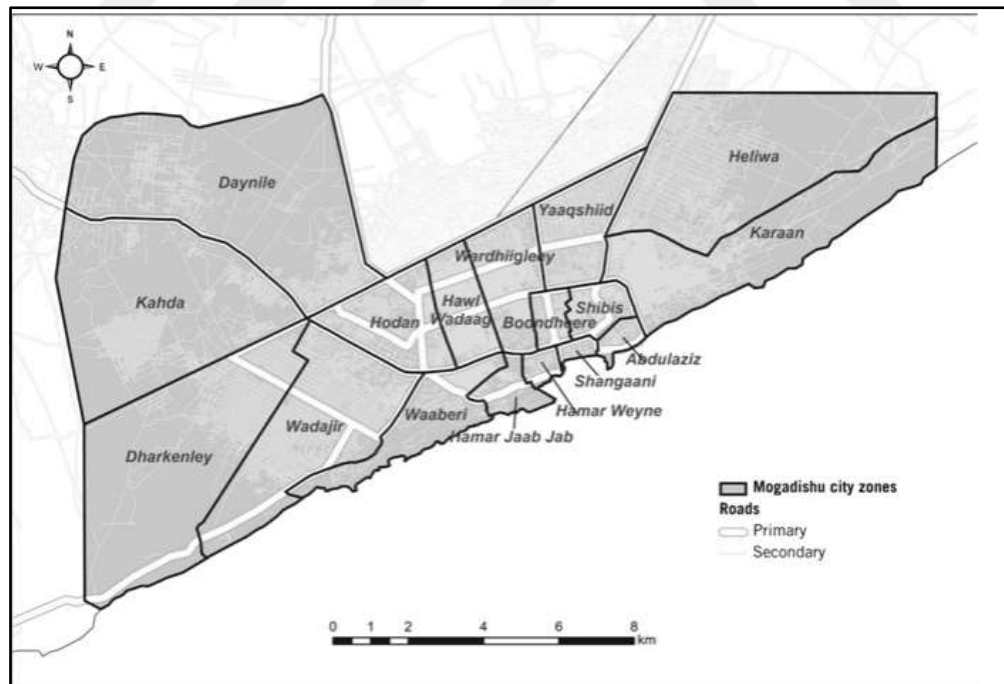


Figure 3.1: Mogadishu City Zone (Bellini et al., 2022).

During Italian colonization in the early 20th century, urban planning efforts expanded Mogadishu's layout, especially around its port, setting a structured grid pattern that persists

today (Bellini et al., 2022). After gaining independence in 1960, Mogadishu saw rapid urban growth fueled by informal settlements, land speculation, and corruption, with its population growing by approximately 10% annually in the 1960s (Bellini et al., 2022). However, this growth was interrupted in 1969 by a military coup led by President Mohamed Siad Barre, which ended the fledgling democratic government and introduced a dictatorial regime. This period of repression was followed by Barre's ouster in 1991, which led to a prolonged phase of political fragmentation and instability (Bellini et al., 2022).

The ensuing power vacuum resulted in fierce competition over land, exacerbated by clan-based displacements and the fragmentation of the city into territories controlled by warlords (Bellini et al., 2022). Urban services collapsed, and Mogadishu's social fabric was fractured, contributing to an ongoing climate of distrust and conflict. The control of Mogadishu remained contested, notably with the Union of Islamic Courts' brief control in 2006 before being displaced by Ethiopian forces and, later, the African Union Mission in Somalia, although periodic violence persists (Bellini et al., 2022).

3.2.1 Mogadishu: The Four Different Existing Cities

Mogadishu as a city composed of four distinct "cities" that coexist with limited interaction, each characterized by unique urban and architectural features shaped by Mogadishu's socio-political and historical context. These four cities are referred to as the Historical City, the 24×24 City, the 100×40 City, and the IDPs (Internally Displaced Persons) City (Bellini et al., 2022). Here's an overview of each:

3.2.1.1 The historical city

The Historical City is the original core of Mogadishu, including districts such as Shingaani and Hamar-Weyne, which comprise the Old Town. This area is noted for its dense urban fabric, narrow alleys, and architectural heritage that combine elements from Islamic, indigenous, and colonial influences, including Italian-era buildings and early Islamic structures (Ledwith, 2014). Historically, this district exemplified a mixture of styles influenced by traders from Arab and Persian backgrounds, contributing to Mogadishu's unique architectural character (Bellini et al., 2022). However, many structures are now deteriorating due to years of conflict, neglect, and a construction boom that threatens the preservation of this heritage (UN-Habitat, 2019). The historical center's deterioration

reflects the broader challenges of balancing urban growth with cultural preservation in Mogadishu (Ali and Cross 2014) Figure 2.14 showcases the historical City grid pattern surrounding Mogadishu's historical center.



Figure 3.2: Satellite Image of Mogadishu the Historical City (Bellini et al., 2022).

3.2.1.2 The 24×24 city

Surrounding the historical center is the 24×24 City, characterized by a regular, grid like pattern with blocks measuring approximately 24×24 meters. This area emerged as part of Mogadishu's early expansion and urban development, with housing blocks divided into smaller plots of 12×12 meters. The urban fabric here is denser, with most plots fully built out, often including a small patio on the side (Bellini et al., 2022). In some commercial areas, shops are positioned along the street, with residences located at the back of the plot. As urbanization has intensified, the original low-rise single-family homes in this district are increasingly being replaced by taller, multistory buildings to accommodate the growing population and meet the high demand for urban land (Bellini et al., 2022). This vertical expansion underscores the pressures of urbanization and the evolving housing needs within the city. Figure 2.15 showcases the 24×24 City grid pattern surrounding Mogadishu's historical center, highlighting its dense urban fabric and evolving architectural trends in response to urbanization.



Figure 3.3: Satellite Image of Mogadishu The 24×24 City (Bellini et al., 2022).

3.2.1.3 The 100×40 city

The 100×40 City consists of regular blocks approximately 100×40 meters in size these blocks, the most extensive urban pattern in Mogadishu, are divided into smaller plots that typically measure 10 to 20 meters in width and 20 meters in depth. This layout emerged in Mogadishu's more recent urban expansions and represents a consistent pattern across the city, supporting a mix of residential and commercial uses (Bellini et al., 2022). Each plot typically accommodates two rows of houses, although plots on the block's edge may be rotated to position entrances on the short side of the block. According to Bellini et al. (2022), the 100×40 City highlights how urban growth has followed a regular, market-driven grid system that reflects Mogadishu's real estate development pressures and the influence of private land developers. The pattern demonstrates the expansion of the city without adequate consideration for environmental factors or sustainable urban management, with large portions of land often subdivided for speculative purposes (UN-Habitat, 2019). Figure 2.16 illustrates the 100×40 grid pattern in Mogadishu's urban expansion, showcasing its regular block design and its implications for residential and commercial development.



Figure 3.4: Satellite Image of Mogadishu The 100×40 City (Bellini et al., 2022).

3.2.1.4 The IDPs city

The IDPs City is the most fragmented and casually constructed section of Mogadishu containing formal and informal human settlements where internally displaced persons (IDPs), refugees, and returnees in continuous political instability and through repeated natural disasters live. These settlements are mostly found in peri-urban areas such as Daynile and Kaxda, which contain the greatest numbers of IDP camps (Joint IDP Profiling Service, 2016). An IDP settlement is frequently poorly built, congested and does not provide necessary services such as sanitation, clean water or health facilities (MPIC, 2016). Many of the residents in these areas have insecure informal tenure, often through renting land on a month-on-month basis without written contracts and are, therefore, at risk of eviction and displacement (Joint IDP Profiling Service, 2016). These precarious living conditions within the IDPs City illustrate the broader socio-economic marginalization and increased housing insecurity for Mogadishu's increasingly displaced and impoverished urban populations (Bellini et al., 2022). Figure 2.17 illustrates the layout and conditions of IDP settlements in Mogadishu, emphasizing their informal nature, inadequate infrastructure, and the challenges faced by displaced populations.



Figure 3.5: Satellite Image of Mogadishu IDPs City (Bellini et al., 2022).

3.3 MOGADISHU TODAY

Today, Mogadishu's physical environment bears the imprint of rapid changes in the cityscape and at the same time feels with realities of violence induced mobility and refugees settling here. After being freed of the rule of al-shabaab in 2012, the city was a site of rebuilding and development driven by investments from the Somali diaspora, as well as private sector expansion, particular in the areas of building and telecommunications (Bryld et al., 2017). Recent years have seen the rapid availability of commercial and residential constructions, as well as increasingly high land prices and property value; in turn, shaping the urban landscape (Bonnet, Bryld, Kamau, Mohamoud, & Farah, 2020)

The built environment of Mogadishu today is extremely heterogeneous but with an aspect of temporality regarding the periods and socio-economic factors. And buildings in major architectural zones, especially with new high-rise constructions and business districts in the central areas, are sometimes planned for commercial development only to satisfy the needs of rich investors such as foreign organizations and several aid service centers. Such new construction is in stark contrast to the sprawling informal settlements across much of the northwestern and southwestern parts of the city such as Hodan, Daynile and Kaxda, where makeshift shelters are prevalent (UNOCHA 2004).

The housing in the slum settlements is temporary buuls (shakes built from sticks, plastic and fabric) or corrugated metal sheet shacks. The specific purposes of these neighborhoods

mainly include the housing for IDPs (internally displaced people) as well as poor Mogadishu citizens who can no longer afford formal housing following an increase in land values. Due to the absence of secure land tenure and planning regulations, cities grow amidst a chaotic expansion with limited or no access to basic services such as electricity, water, or sanitation (UN-Habitat, 2019). This variation also highlights the architectural division of the city, where formal areas begin to develop and modernize, and informal settlements remain vulnerable in poor housing conditions.

Factors including speculative investment, diaspora returnees reclaiming land and real estate prices soaring have led to increased land prices which are forcing the demand for affordable housing (Bonnet, Bryld, Kamau, Mohamoud, & Farah, 2020). Nevertheless, despite lacking widespread regulatory oversight and fragmented governance, many parts of it are built without urban planning or sustainable development (UN-Habitat, 2020a). As a result, in modern day Mogadishu, the skyline reflects an ambiguous juxtaposition of developed commercial districts along with decaying old-city neighborhoods and growing informal settlements all suggesting that there is an urgent requirement for comprehensive urban unified planning to tackle the housing and infrastructural needs of the city.

3.3.1 Main Actors in Mogadishu in Terms of Land Access, Management and Occupation

Competing actors in accessing, managing, and claiming land reflect both the messy nature of the socio-political system at play as well as what urban poverty has forced upon Mogadishu a fragmented web of displacement politics (Bonnet, Bryld, Kamau, Mohamoud, & Farah, 2020). Here's an overview of each:

3.3.1.1 Benadir regional administration (BRA)

The BRA is the Benadir Region local government and thus covers also Mogadishu and surrounding areas. BRA being the formal authority is responsible for land administration and urban planning. Due to scarce resources and governance failures, its control is partial and a lot of the land use in the city continues to be shaped by informal practices and actors. (Bonnet, Bryld, Kamau, Mohamoud, & Farah, 2020)

3.3.1.2 Internally displaced people (IDPs)

IDPs are those who have fled their homes elsewhere in Somalia due to conflict, famine or drought and are now living here in Mogadishu. To be sure, it is undecided how long you need to live in Mogadishu to stop being an IDP but clearly this makes a key difference for the provision of humanitarian assistance. Most IDPs live in informal settlements with insecure tenure and are regularly evicted by landowners (or gatekeepers managers of these areas) (Bonnet, Bryld, Kamau, Mohamoud, & Farah, 2020)

3.3.1.3 Urban poor

Low-income resident of Mogadishu may be a native of the city or have come to the city from another region many years ago. While many may be entitled to IDP status for aid, others face the same housing difficulties such as lack of tenure security and inhuman conditions (Bonnet, Bryld, Kamau, Mohamoud, & Farah, 2020).

3.3.1.4 Gatekeepers

Gatekeepers are informal, self-appointed managers of Mogadishu's informal settlements. They secure land from local landlords or chieftaincies and facilitate access for IDPs, urban poor, and other displaced groups. Gatekeepers also collect fees or "taxes" on aid provided to residents, positioning themselves as intermediaries between these populations and aid organizations or local authorities. With approximately 140 gatekeepers operating across Mogadishu as of 2017, their role often extends to providing basic services, although the quality and accountability of these services are limited, sometimes leading to exploitation (Bonnet, Bryld, Kamau, Mohamoud, & Farah, 2020)

3.3.1.5 Chieftaincies

Chieftaincies are social groups often tied to clan affiliations, holding varying degrees of influence over land in Mogadishu. They may own or seek control of land for economic and political leverage. These groups contribute to the informal power structure within Mogadishu, especially in areas where formal governance is limited (Bonnet, Bryld, Kamau, Mohamoud, & Farah, 2020)

3.3.1.6 Landlords/Landowners

In places like Mogadishu, meals on wheels; landlords or landowners within informal settlements are the owners of parcels of land. They might rent out these plots to IDPs, the urban poor, or other vulnerable citizens sometimes through intermediaries known as gatekeepers. Landowners reside either in or out of Somalia, and in many cases do not have title deeds as they are displaced from their land due to the ongoing civil war. Because of that, known landowners have been seen using the land for alternative means or business and thus tackling quick eviction disputes over the ownership of the land without sufficient notice or relocation plans to property residents (Bonnet, Bryld, Kamau, Mohamoud, & Farah, 2020).

3.4 CONCERNS ABOUT THE CHALLENGES OF HOUSING: HOUSING DEMAND AND LEVELS OF AFFORDABILITY IN MOGADISHU

In the last decade, Mogadishu's housing market has experienced significant changes driven by increased investment, especially from the Somali diaspora. The high demand for housing fueled by rapid urbanization has attracted real estate investors to the city. This influx of interest led to the establishment of the Somalia Real Estate Association (SREA) in 2014, marking a milestone in professionalizing and potentially regulating the real estate sector (CAHF, 2020).

However, the growth in demand has also resulted in rising land values, pushing many developers to the city's outskirts where land is more affordable. Examples include large-scale housing projects like Daru Salaam City, which aims to build 6,000 units over five years, and the Jazeera Estate near the airport, set to include 1,200 housing units along with commercial and social facilities. Unfortunately, these projects are targeted toward higher-income residents, contributing little to addressing the broader housing shortage affecting the general population (CAHF, 2020).

Property prices within the city have soared, with newly built homes by developers priced at around \$70,000 to \$130,000. With an average home price of \$100,000, this figure is well beyond the reach of nearly all Somalis, given the average monthly income of \$225. At an 8.5% interest rate repaid over 30 years, monthly payments would amount to \$769 completely unaffordable for the average resident (CAHF, 2020). This financial strain has

also led to an increase in forced evictions, displacing vulnerable populations further from the city center (Joint IDP, 2016).

The challenges of affordability are compounded by limited access to financial products and short loan repayment terms, sometimes as short as three years. The affordability gap between the rich and poor is extensive in Mogadishu's housing markets (CAHF, 2020) due to high down payments, high Murabaha rates and a few real estate developers. It also reflects a critical need for affordable accommodation options, particularly for IDPs, urban poor and the fact that a new low-middle class is growing within the city that are still outside the formal housing market.

3.4.1 Housing Typologies in Mogadishu

Mogadishu houses straddle a wide range of types, serving the city's porous socio-economic classes from standard-issue rooves to proxy villas. Although these cater for varying economic classes, they provide limited and unsecured choice to low-income earners and Internally Displaced Persons (IDPs) (Bonnet, Bryld, Kamau, Mohamoud, & Farah, 2020). Here's an overview of each category of housing.

3.4.1.1 Traditional Housing Forms (Buuls)

Description: Buuls are the most basic form of shelter, constructed using sticks, cartons, plastic sheets, or cloth. Typically built, these shelters are mostly occupied by IDPs and other residents who cannot afford formal housing. Due to their low cost and informal construction, buuls are largely concentrated on the city's outskirts where land is cheaper, and the housing market is less restrictive (Bonnet, Bryld, Kamau, Mohamoud, & Farah, 2020). Figure 2.18 depicts a typical buul shelter, highlighting its basic construction materials and its prevalence in the outskirts of urban areas as a low-cost housing solution for vulnerable populations



Figure 3.6: Buul (A Typical Ancient Housing) (Omar et al., 2020).

Affordability: The average Rent in a buul is about \$13 per month, although in practice most residents do not pay rent since they build these structures themselves, with help from family and friends.

Challenges: Buuls are not a permanent solution and provide very little to no protection from weather conditions or falling victim to local security threats. Buuls residents are often on the outskirts of a city, with very little access to sanitation, water and health services characteristic of those in such settings

3.4.1.2 Corrugated iron sheet housing

Description: Corrugated iron sheet housing is one of the most common and accessible types of housing in Mogadishu, especially for low-income earners and lower-middle class families. These homes are a little more permanent than temporary buuls and made mostly of corrugated iron sheets; they are seen both within and on the fringes of the city. This particular home was extremely popular after the civil war due to its cost effectiveness, while solving the different housing problems (UN-Habitat, 2020a) in their city.

The quality of such structures is a major challenge because of Mogadishu's hot climate. The iron sheets provide little protection against heat, making the interiors unbearably hot during the day and inadequately warm during nighttime, when temperatures fall.

Although attempts have been made over the years to make these homes more durable and high-quality, they are still far from ideal in terms of insulation and comfort (Bonnet, Bryld, Kamau, Mohamoud, & Farah, 2020).



Figure 3.7: Corrugated Iron Sheet Housing (google .com).

Affordability: Although these homes are of comparatively low quality, many inhabitants with lower incomes cannot afford them because of their monthly rent of about \$140. The increased demand for housing and the dearth of reasonably priced units are reflected in this rent level

Challenges: The high cost of rent for these subpar homes puts a strain on low-income people, making it hard for them to pay for other necessities. Additionally, these homes are not well-insulated, which makes privacy and heat-related problems worse.

3.4.1.3 Government-owned buildings

Some internally displaced people, especially those from majority clans, live informally in abandoned government buildings. These structures which are frequently concrete and situated close to informal communities offer superior shelter to temporary residences (Bonnet, Bryld, Kamau, Mohamoud, & Farah, 2020).

Advantages: Compared to buuls or corrugated iron homes, residents of these government buildings have the protection of more robust structures. However, these people are at risk of being evicted due to the absence of official tenancy agreements

Challenges: Since evicting these occupants could be interpreted as targeting clans, squatting in government-owned structures can be politically delicate. Furthermore, a lot of locals choose to relocate to informal settlements because they offer greater access to community support and services

3.4.1.4 Modern housing typologies (Apartments,)

The majority of people living in apartments in Mogadishu are middle-class and upper-middle-class. These apartments are typically found close to the city center, providing easy access to social amenities, job centers, and necessary services (UN-Habitat, 2020a). Following Mogadishu's 2012 recapture from al-Shabaab, which signaled a time of increased economic growth, stability, and planned housing developments, apartment construction increased (CAHF, 2020). International investors that see Mogadishu as an emerging market with attractive real estate opportunities and the return of the Somali diaspora, who make a considerable contribution to the local economy, further support this rise (Bryld et al., 2017).

Affordability: Apartments in Mogadishu usually have monthly rents between \$350 and \$500, which is within the means of the middle- and upper-middle classes in the city (CAHF, 2020). The relatively higher style of life, as well as the infrastructure and service accessibility that these flats offer, are reflected in the price. Nevertheless, the cost effectively restricts accessibility to a subset of the population, making these advancements unaffordable for lower-income groups.

Challenges: The focus on apartment construction for middle- and upper-income residents contributes minimally to solving Mogadishu's widespread affordable housing crisis. The high rental prices, inaccessible to most low-income households and internally displaced people (IDPs), underscore this disparity (Joint IDP Profiling Service, 2016). Lower-income residents, particularly those who have resided on government lands or informal settlements in structures like corrugated iron sheet housing (locally known as *bacweyne*), are increasingly vulnerable to displacement. As the city grows and higher-value real estate developments expand, the government and private developers are displacing long-established low-income residents in favor of lucrative real estate projects.

This shift intensifies the housing crisis by prioritizing investments that cater to wealthier groups, while the urban poor and IDPs face eviction from informal housing. Without intervention or policies to protect vulnerable populations and provide affordable housing options, Mogadishu's lower-income residents remain excluded from formal housing

markets, which exacerbates socio-economic inequalities and heightens the city's affordable housing deficit.

3.4.1.5 Modern housing typologies (Villas)

Description: Villas are detached houses with private compounds, often located in older sections of the city and on the outskirts where space is more abundant. Historically, villas were built by well-off Mogadishu residents, and many of these properties remain empty as their owners fled during periods of conflict. Recently, new villas have been developed within the city by wealthy Somalis and are also rented out to foreigners or international organizations (Bonnet, Bryld, Kamau, Mohamoud, & Farah, 2020).

Affordability: Villas are only accessible to the upper-middle class, wealthy residents, or international tenants. They offer high privacy and security due to their detached design and fenced compounds, making them desirable for affluent residents and organizations.

Challenges: The construction of new villas often caters to a small, wealthy segment of Mogadishu's population, further widening the gap between socio-economic groups. Additionally, many villas lie vacant, contributing to a shortage of affordable housing as prime land is used for properties that remain unoccupied.

3.4.2 Summary of Housing Gaps and Challenges in Mogadishu

Mogadishu's housing options starkly illustrate the city's socio-economic divisions. While villas and apartments offer quality housing for the wealthy and middle classes, options for low-income residents are limited to buuls, corrugated iron sheet houses, or informal occupancy in government-owned buildings residences (Bonnet, Bryld, Kamau, Mohamoud, & Farah, 2020). The high costs associated with even the most basic rental options, such as corrugated iron housing, make it challenging for the average Somali to secure formal housing. As the city's real estate market expands, low-income residents are also being pushed out. Exacerbating urban inequality and forcing the needy to the city's outskirts, the areas where they are confronted with the lack of job stability and the denial of basic services. This is a clear indication that there is an urgent need to have policies that address solutions the in affordable housing to cater for the increasing housing deficit in Mogadishu.

The research on affordable housing and the analysis of the strategies show that housing affordability is not only a numerical issue. Affordable housing is not only a blessing for the people in need; it builds up the whole society not only the individuals in need by promoting equality and fostering sustainable growth. Its impact is not limited to just one aspect it has social, economic and environmental impacts which contribute towards the overall objectives of sustainable urban growth.

However, addressing affordable housing is not solely an architectural challenge. While architecture plays a vital role, it's only one piece of a larger puzzle. Affordable housing requires the collaboration of a wide range of stakeholders, including policymakers, urban planners, legal experts, engineers, and developers. As Annie Koo, Associate Director for Development at Sidewalk Labs, aptly explains, Housing is really complicated. There's an entire ecosystem involved from governments, who provide funding and set zoning regulations, to builders, architects, and engineers working to design and construct livable spaces. No single player has enough control or stake to create affordable housing on their own (Jaffe & Quirk, 2019).

This complexity means that affordable housing is inherently a multidisciplinary issue, requiring a cooperative, cross-sectoral approach. Short-term fixes are insufficient. Instead, local and national authorities must develop long-term strategies that empower the public and private sectors, as well as nonprofits, to create lasting solutions. Governments, in particular play a crucial role in streamlining bureaucracy, updating building codes, revising zoning laws, and establishing land-use policies that facilitate affordable housing. Beyond increasing the supply of affordable housing, it is equally important to maintain quality standards and ensure long-term affordability throughout the building's lifespan.

As noted by Benedikt Hartl (2018), true cost-efficiency in housing requires considering the full life cycle of a building. While construction costs per square meter are essential for initial budgeting, long-term sustainability, durability, and architectural quality are equally critical to the project's overall economic value. Hartl stresses the need to distinguish between "cheap" investments driven by profit-maximizing motives and "cost-efficient" strategies that prioritize sustainability and resilience over time (hartl, 2018, p. 32). This long-term perspective helps ensure that affordable housing remains accessible, functional, and valuable to communities well into the future.

The challenges created by the escalating housing crisis in Mogadishu. Rising land and property prices, driven by speculative investment and diaspora remittances, it has become unaffordable for the ordinary Somali citizen thereby worsening socio-economic inequalities (CAHF, 2020). Besides growing the wealth disparity, this demand driven price growth has forced low-income citizens to seek refuge in the city's periphery, where they face insecure tenure and inadequate infrastructure. The problem is also compounded by the scarcity of affordable financing options, where inaccessible formal homeownership is all but a small fraction of the population due to high down periods Payments and short loan repayment (World Bank, 2018).

The multifaceted structure of Mogadishu's housing challenge highlights the difficulties related to governance, land availability, and housing affordability. Nonetheless, policies and solutions for affordable housing are critically needed. The evidence presented in this study shows that there is the need for the government to step in and develop policies that will govern the provision of land to low-income residents and provide equal opportunity in access to land and facilitate the provision of affordable houses. Some of the suggested approaches include subsidized land allocation; incentives for affordable housing developers, infrastructure and enhancement of the informal settlements are essential steps toward bridging Mogadishu's housing gap.

Also, it is important to note that interdisciplinary collaboration is crucial. The problem of affordable housing in Mogadishu cannot be solved by one organization. it needs the input of government support, urban planners, architects and non-governmental organizations in order to meet both the immediate and the future needs of the population concerning housing. It is not enough to view the affordable housing problem in Mogadishu as merely a physical challenge that can be solved by building more apartments. It is a question of promoting sustainable urban development, social justice and the creation of a stable housing market that can accommodate everyone.

The contextual analysis in Chapter 3 highlighted the pressing housing challenges faced by Mogadishu's low-income communities, emphasizing factors such as land tenure issues, informal settlements, and socio-economic vulnerabilities. These challenges underscore the critical need for innovative, scalable, and sustainable housing solutions that are both affordable and contextually appropriate. To address these issues, Chapter 4 transitions to

an examination of global examples that have successfully implemented strategies for affordable housing. By analyzing projects such as Quinta Monroy in Chile, LILAC in the UK, and Casa Real in Mozambique, this chapter identifies practical design principles, construction methods, and policy interventions. These examples provide valuable insights and frameworks that can inform tailored strategies for Mogadishu, bridging the gap between global best practices and the city's specific needs.



4. ANALYZING SUCCESSFUL AFFORDABLE HOUSING PROJECTS

To develop actionable strategies for addressing the affordable housing crisis in Mogadishu, this chapter explores three exemplary projects from diverse global contexts: Quinta Monroy by Elemental (Chile), LILAC (Low Impact Living Affordable Community, UK), and Casa Real in Mozambique. These projects were carefully selected based on their relevance to Mogadishu's unique socio-economic, cultural, and environmental challenges. The projects represent innovative approaches to affordable housing design and construction, each offering valuable insights into how global best practices can be tailored to address local needs in Mogadishu.

Project Selection

The projects included in this analysis were chosen not only for their success in delivering affordable housing but also for their alignment with critical themes pertinent to Mogadishu, such as informal settlements, urban resilience. Each project provides a unique lens to examine how architectural and urban planning innovations can address affordability, sustainability, and socio-cultural integration.

a. Relevance to Mogadishu's Context:

Mogadishu's rapid urbanization, informal settlements, and land tenure issues mirror challenges addressed by the selected projects. For example:

- i. Quinta Monroy tackles informal settlement upgrades through incremental housing, enabling residents to expand their homes over time.
- ii. LILAC emphasizes community-led governance, a model applicable to Mogadishu's fragmented urban governance.
- iii. Casa Real integrates climate-resilient, low-cost designs suited to Somalia's environmental vulnerabilities.

b. Innovative and Cost-Effective Solutions:

Given the economic constraints faced by Mogadishu's low-income communities, the case studies were chosen for their emphasis on cost-effective construction techniques and innovative housing models. For example:

- i. Quinta Monroy reduces initial costs through “half-house” designs, allowing resident-led expansion.
 - ii. LILAC utilizes modular construction and recycled materials to lower expenses.
 - iii. Casa Real employs locally sourced materials to minimize costs and environmental impact.
- c. Climate Resilience and Sustainability:

As Mogadishu faces increasing vulnerability to climate change, the selection prioritizes projects that integrate climate-adaptive strategies.

- i. Casa Real’s energy-efficient designs and flood-resistant foundations offer direct lessons for climate adaptation.
 - ii. LILAC achieves carbon neutrality through passive heating and renewable energy systems.
- d. Cultural and Social Relevance:

The selected projects align with Mogadishu’s communal living norms and spatial constraints:

- i. Quinta Monroy’s flexible layouts accommodate extended families, reflecting Somali household structures.
 - ii. Casa Real’s community-centric planning fosters social cohesion, critical in Mogadishu’s fragmented neighborhoods.
- e. Scalability and Documentation:

Each selected project is well-documented, with extensive data on design, construction methods, and outcomes. This ensures that the analysis can provide a comprehensive evaluation and generate actionable insights for Mogadishu.

- i. Quinta Monroy and LILAC provide blueprints for scaling incremental and cooperative housing models.
- ii. Casa Real’s use of local labor and materials ensures adaptability to Mogadishu’s resource constraints.

Purpose of Comparative Analysis

The comparative analysis in this chapter aims to extract key lessons from these projects, focusing on their design features, construction techniques, socio-cultural relevance, and cost-effectiveness. By synthesizing insights from these projects, the chapter provides a foundation for proposing tailored strategies that align with Mogadishu's unique challenges and opportunities. This approach bridges global best practices with local realities, emphasizing the importance of context-sensitive solutions for affordable housing.



4.1 QUINTA MONROY/ ELEMENTAL PROJECT

According to the New Urban Agenda, affordable housing is an essential need, a widely recognized human right, and a sign of a high standard of living (UN-Habitat, 2017). Latin American countries were the first in the global south to rapidly urbanize, leading to economic disparities and stark contrasts. However, 20% of the population still lives in slums since housing policies in Latin America were unable to address the massive housing pushes that target low-income populations (World Bank, 2018).



Figure 4.1: Quinta Monroy// ELEMENTAL//2005, Front View (Ma, 2022).

4.1.1 Design Features

- a. **Design Approach:** ELEMENTAL adopted a row house typology with a modular design that allows for flexible future expansions (Adeyemi et al., 2024). Each unit initially provides 30 square meters of core living space, including essential rooms like a kitchen, bathroom, and living area. These basic units are stacked in two-story row houses, optimizing land use on the compact site (O'Brien & Carrasco, 2021).
- b. **Incremental Housing Model:** The main innovation in Quinta Monroy is the "half-house" concept, in which only part of each home is constructed at first (Vergis et al., 2022). The structure has a solid frame that enables residents to expand their homes upward and outward as they gain financial stability. Through these expansions, each home can double in size, eventually reaching up to 60 square meters as families add to their units over time (Vergis et al., 2022).
- c. **Community Layout:** The housing units are arranged in blocks that create a courtyard-like layout, which fosters community interaction. These open spaces within the blocks

are utilized as communal areas, promoting social connections among residents and providing a sense of community (ELEMENTAL, 2017).

4.1.1.1 Incremental design

Since the 20th century, Latin American governments have been credited with pioneering initiatives that validate self-hop housing (UN Habitat 2011). The housing policies put in place by Latin American governments are multifaceted programs that begin with a basic dwelling unit. Depending on the residents' willingness to pay, these units served as the foundation for further extensions (Carrasco & O'Brien, 2021). Since the early 1950s, Chilean housing projects have been implementing incremental methods that target slums in particular. Quinta Monroy Housing was one of the most creative and experimental concepts to come forth in this regard (Carrasco & O'Brien, 2021).

4.1.1.2 Social housing prototype

Quinta Monroy was not a one-size-fits-all solution, and the architect wanted to replicate the approach in other geographical locations. The construction methods, materials, and progressive design structure increased this building strategy's versatility.

4.1.1.3 Project information

Architect: ELEMENTAL, Alejandro Aravena

Location: Quique, Chile

Year of Built: 2005



Figure 4.2: Quinta Monroy, 2005, Location (Ma, 2022).

Quinta Monroy was built by ELEMENTAL built-in Iquique, a city in the north. Redeveloping one of the few informal rural areas in the city core was the aim. Early migrants first occupied the property, and as the population grew from 50 to 100 families, there was a need for better housing. This was accompanied by the emergence of self-built homes and challenges in obtaining water, power, or sanitary facilities (Carrasco & O'Brien, 2021).

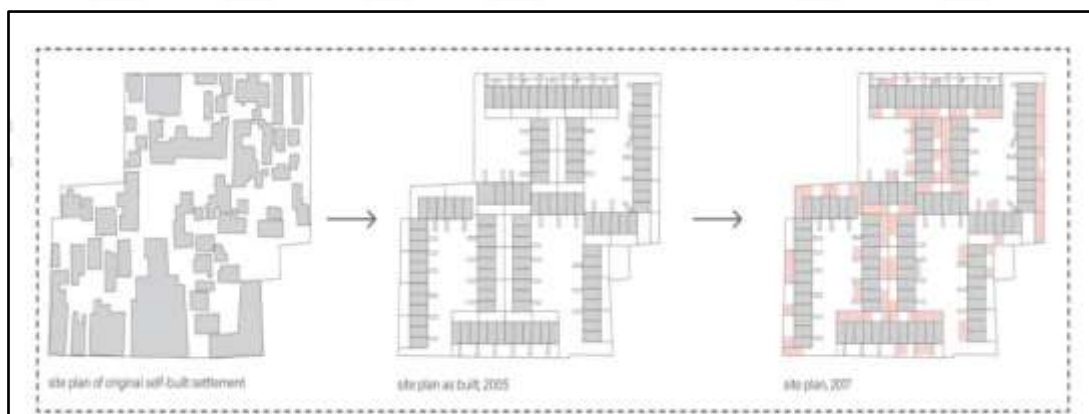


Figure 4.3: Quinta Monroy (2005), Site Plan Transformation (Ma, 2022).

The project's task was to build a home for 100 families in a slum that was already 30 years old. Ninety-three housing units were arranged in four main courtyards in the concept. Three-by-six-meter modules make up the housing units. Residents are given the option to self-building housing extensions, which should occur 12 years after the project is finished.

4.1.2 Architecture Concept of Quinta Monroy

4.1.2.1 Building typology

To tackle the insufficiency of the number of housing units during rapid population growth, ELEMENTAL decided to build the Quinta Monroy based on a unique typology model that divides a full family home into two halves. This "half-a-house" typology was an efficient way to accommodate all the families to live on a limited amount of area of the site. As a result, the typology allowed for 93 family units total in the social housing complex.

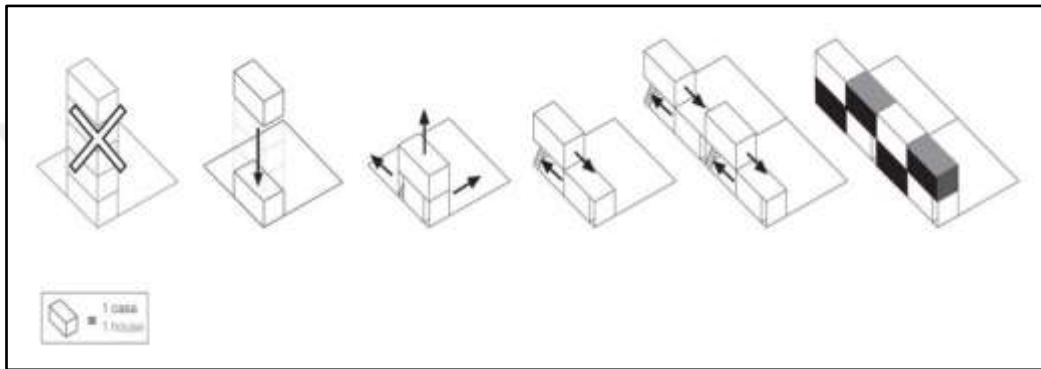


Figure 4.4: Diagram of Typology Conceived (ELEMENTAL, 2007).

The lower ground floor of the first typology is meant to be a single housing unit consisting of three modules, one of which remains unfinished. The top two levels combined form the next typology, which consists of four 3x6 m duplex flats. Of these modules, two are still incomplete. As a result, the first 36 square meters of modules are used, and the total area in the case of an extension is 72 square meters. About four bedrooms (3 x 3 m) and a closet/double bed are included in the 72sqm. Bathrooms are typically located at the front door to save money on pipes, but in this instance, a large area large enough to accommodate a tub and washing machine is supplied instead of merely a shower.

4.1.2.2 Incremental design

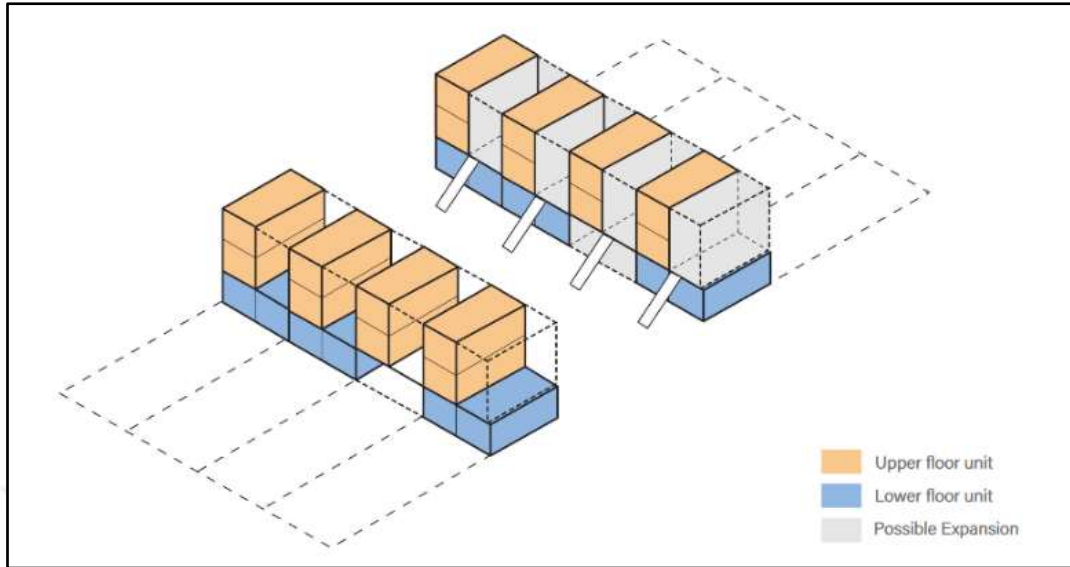


Figure 4.5: Stacking Axonometric Diagram (Ma, 2022).

The apartment complex was designed with a stacking system of units in consideration; the ground level units are in blue, and the upper floor duplexes for the second and third levels are in orange for the permanent first building units. The units are stacked such that there is no overcrowding issue, and the building may be low rise and high density. Incremental design refers to the possibility of future additions to the units due to their staggered arrangement.

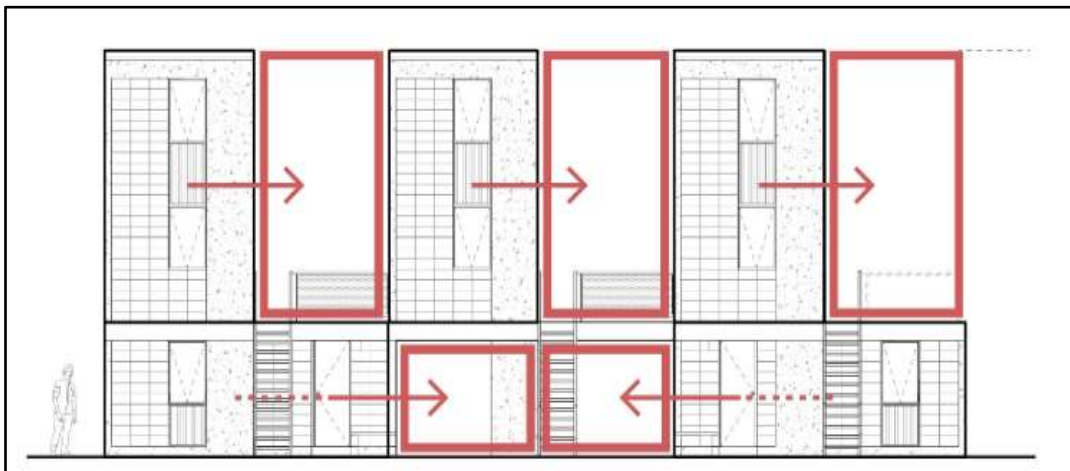


Figure 4.6: Quinta Monroy/ Elevation with Possible Unit Addition (Arch Eyes 2020).

In the context of housing development, incremental design is a method that offers a foundational framework upon which the individual owner can thereafter build and extend at their own pace and financial capacity. In order to give the occupants, the ability and chance to enlarge their living space, ELEMENTAL used an incremental design in this project. Residents can actively participate in the extension of their homes through bespoke additions made possible by incremental design. As of 2020, 92 out of 93 units have undergone additions, demonstrating the effectiveness of the plan the architect advocated to the tenants (Carrasco & O'Brien, 2021).

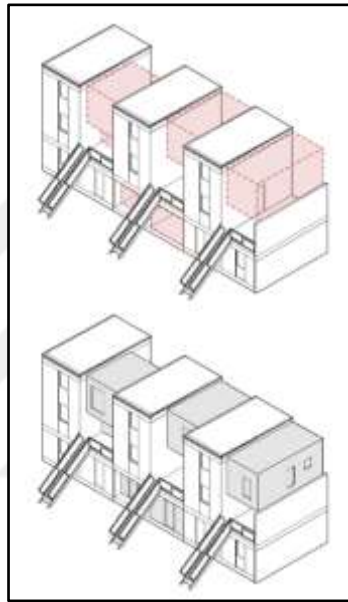


Figure 4.7: Quinta Monroy// Incremental Design Addition// (ELEMENTAL, 2022).

The basic building of Quinta Monroy features a concrete and CMU block core that is structurally strong and designed to support any future extensions that may occur once construction is finished. The architect's fundamental structure included the kitchen, stairs, bathroom and plumbing, partitions, and other structural elements. The residents continued to use lightweight construction materials to fill the spaces between units in accordance with the architect's instructions (Ma, 2022).

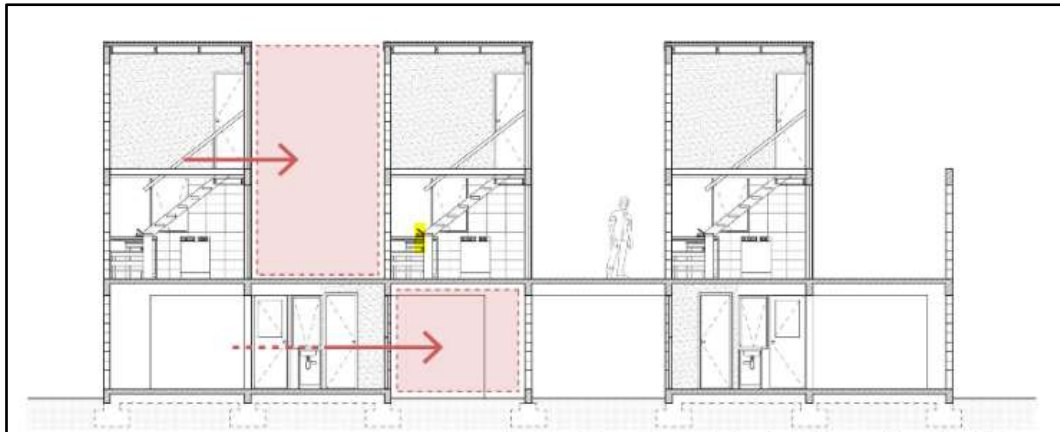


Figure 4.8: Sections with Possible Unit Addition (ELEMENTAL, 2022).

4.1.2.3 Floor plans

The initial 30-square-meter floor plan includes a small kitchen, bathroom, and a multipurpose living space (Ma, 2022). This layout optimizes functionality within a compact footprint.

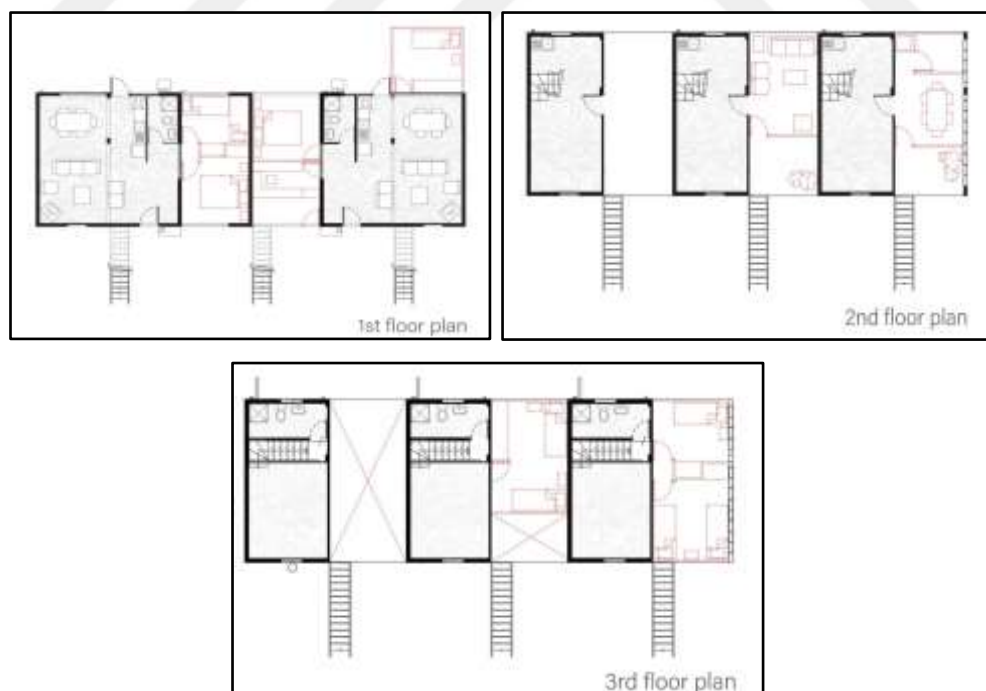


Figure 4.9: Floor Plans with Extension (Ma, 2022).

Plans showing potential additions to the first, second, and third floors in red, as well as potential additions to the bedrooms and living areas.

The community is involved in the process and collaborates to create the complex a better livable place thanks to the incremental design element. As a result, within five years of the building's completion, the value of each property increased by at least \$20,000 (Aravena, 2011). This demonstrates the architectural philosophy's effectiveness in empowering the local community and fostering a successful investment in their resources. With this experimental implementation of incremental design, the ongoing societal issue of housing shortages and slums in Chile was successfully addressed (Ma, 2022)

4.1.3 Circulation (Public real)

The public circulation of Quinta Monroy is thoughtfully designed to foster community interaction while optimizing limited space. The project employs a courtyard-based layout, with the row houses arranged around shared open spaces that act as community courtyards. These courtyards are crucial to the design, serving as both circulation paths and social areas where residents can interact, children can play, and community gatherings can occur (Ma, 2022)

Here's a closer look at the circulation strategy:

- a. **Central Courtyard Spaces:** The primary circulation path runs through these communal courtyards. Rather than traditional hallways or corridors, the open courtyards allow residents to move between units, enhancing natural light and ventilation. This open arrangement breaks down barriers and encourages a sense of neighborhood within the complex.
- b. **Connection to Residential Units:** Each row house has direct access to these shared courtyards, creating seamless flow between public and private spaces. Since the units are accessed from the courtyards, the need for interior corridors is minimized, saving space and construction costs.
- c. **Efficient Use of Land:** The courtyard circulation allows more efficient use of the available land, with pathways integrated into the living spaces rather than requiring

additional space for roads or alleyways. This layout enhances connectivity and accessibility while preserving the compact footprint.

- d. Flexibility for Future Expansion: The design's circulation strategy supports the incremental housing concept, with easy access points that allow residents to expand their units without disrupting the flow of movement within the community.

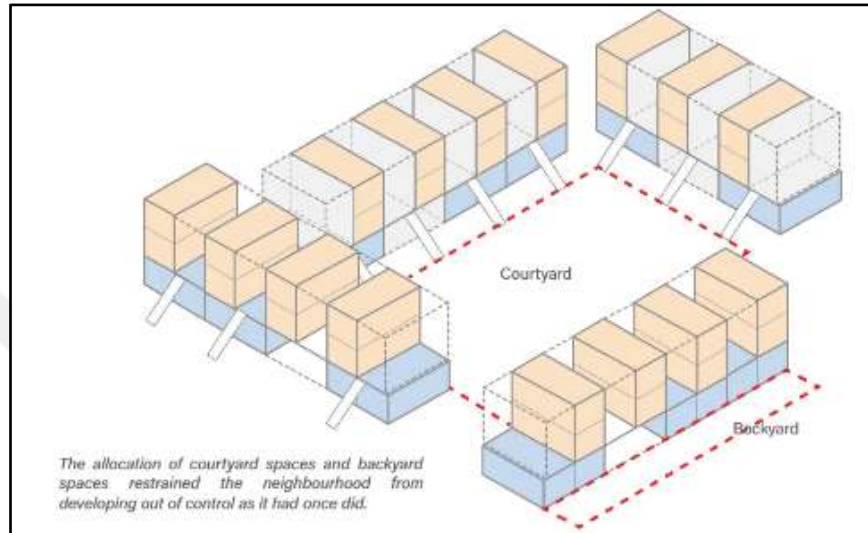


Figure 4.10: Quinta Monroy/Public Circulation (ELEMENTAL 2022).

In summary, Quinta Monroy's public circulation focuses on creating shared, multifunctional courtyards that serve as both circulation paths and community hubs, reinforcing a sense of belonging and maximizing land use efficiency. This approach also supports the incremental expansion of units by maintaining flexible, accessible pathways.

4.1.4 Materials Used in Construction

They provided a middle-class home, of which they were now only providing a little portion, rather than designing a tiny one (everything is small in 30 square meters). This resulted in a modification of the standard: all challenging areas of the house, including the kitchens, bathrooms, staircases, and partition walls, had to be planned for the eventual 72-square-meter home. (ELEMENTAL 2020)



Figure 4.11: Construction Materials (Ma, 2022).

ELEMENTAL had set various restrictions on the self-built additions at the beginning of the project, including rules for the materials as well as construction techniques. It was advised to use lighter materials for building the additions (Carrasco & O'Brien, 2021). The primary materials are concrete and cement blocks, chosen for their durability and low cost. These materials provide a solid, resilient structure that can withstand the desert climate of Iquique. Whenever possible, locally sourced materials were used to reduce transportation costs and support the regional economy. This approach aligns with ELEMENTAL's goal of cost-effectiveness and environmental responsibility. Interiors are left with basic finishes, allowing residents to gradually improve and personalize them. The initial materials are durable enough to withstand long-term use while minimizing maintenance costs, which is essential for low-income residents.

4.1.5 Construction

Phase 1: After the site has been cleared, the lower residence's walls and floors are built to act as the foundation.

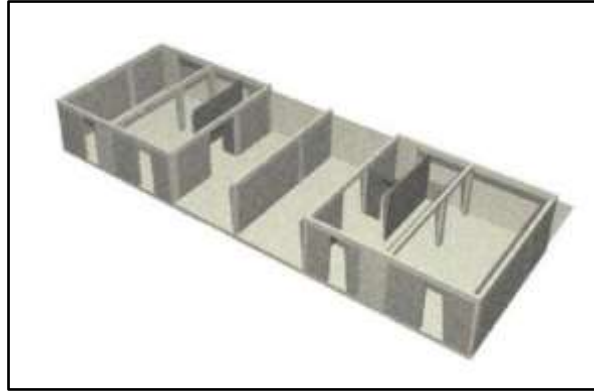


Figure 4.12: Construction Phase 1 (Ma, 2022).

Phase 2: The roof is built to support the entire upper home structure as well as any future extensions planned.

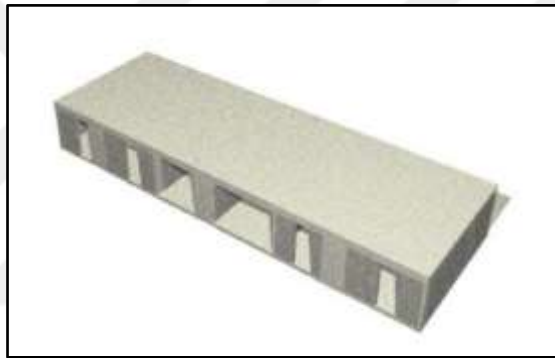


Figure 4.13: Construction Phase 2 (Ma, 2022).

Phase 3: The higher residences' walls have been built. To provide simpler removability for further extensions, some walls are left free to be constructed using a different system.

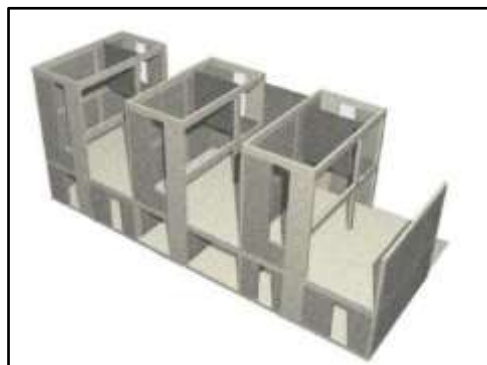


Figure 4.14: Construction Phase 3 (Ma, 2022).

Phase 4: The interior has a wood frame constructed to support the stairs and loft.

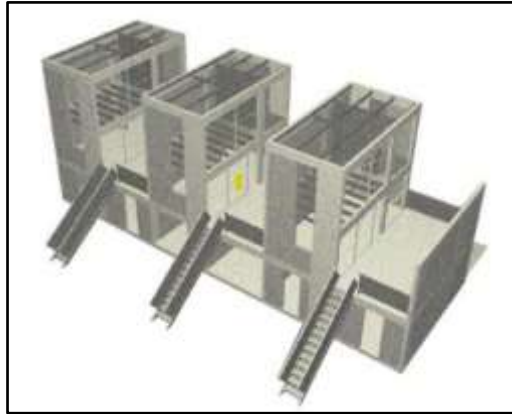


Figure 4.15: Construction Phase 4 (Ma, 2022).

Phase 5: When the last components are built, residences move in.

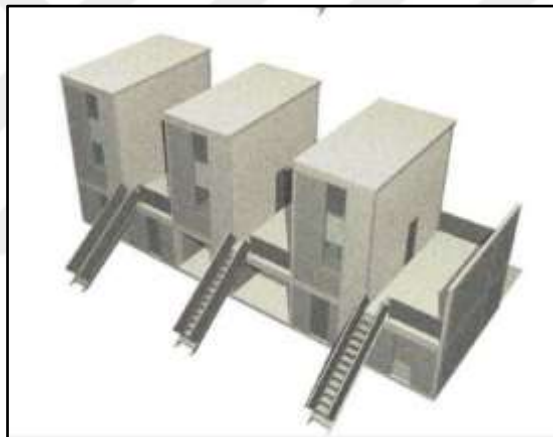


Figure 4.16: Construction Phase 5 (Ma, 2022).

Phase 6: Every step was considered during the building phases in order to develop a straightforward and cost-effective plan for future expansion. As a result, construction expenses were reduced, enabling early occupancy.

Since these extensions were made of need and come in many kinds of shapes, the figure below also illustrates how much of the tenants' distinctive qualities can be seen through designs.



Figure 4.17: Construction Phase 5 (Ma, 2022).

4.1.6 Cost-Effectiveness

The Quinta Monroy project is a model of how affordable housing can be achieved without compromising quality. ELEMENTAL implemented several key strategies to manage costs effectively:

- a. **Budget Constraints:** The project operated within a strict subsidy of approximately USD \$7,500 per family, covering land acquisition, infrastructure, and initial construction costs. ELEMENTAL worked within this limited budget by building only half of each house initially, thus lowering upfront costs while establishing a framework for future expansions (O'Brien et al., 2020).
- b. **Incremental Construction:** By constructing only the core structure and allowing residents to expand their homes over time, ELEMENTAL significantly reduced initial construction costs. This approach enabled them to deliver each unit at an average cost of USD \$204 per square meter, making it feasible within the subsidy available (Aravena, 2008).
- c. **Resident Involvement:** The incremental housing model allows residents to take on the responsibility of construction for their expansion, either independently or with the help of local labor. This method reduces labor costs while promoting a sense of ownership and empowerment among residents, as they are directly involved in customizing their homes (Mukhija, 2014).

- d. **Efficient Land Use:** The design's compact, high-density row house model maximized land use and minimized infrastructure costs. ELEMENTAL's strategy allowed all 100 families to remain on the original site, avoiding relocation expenses and maintaining residents' access to central city resources, essential for their livelihoods (Aravena, 2008).
- e. **Long-Term Affordability:** The half-house approach promotes self-financed improvements, making the project not only affordable initially but also adaptable to residents' changing financial circumstances. This flexibility ensures that housing remains affordable and meets families' needs over time, thus reducing the likelihood of future rehousing needs (Mukhija, 2014).



4.2 LILAC, LEEDS, UK, PROJECT

Lilac, which stands for Low Impact Living Affordable Community, is a community-led cohousing initiative that is affordable, environmentally friendly, and nonprofit. “Located in a suburban area of Leeds in the north of England” (Chatterton, 2013; World Habitat, 2015). Lilac is an intergenerational community with a range of socioeconomic backgrounds that was built on a former school site (Chatterton, 2013; Hopkins, 2014; Lawton, 2019). Paul Chatterton, a cofounder and project resident, claims Lilac is “the first affordable low impact mutual cohousing project in the United Kingdom” (Chatterton, 2013).

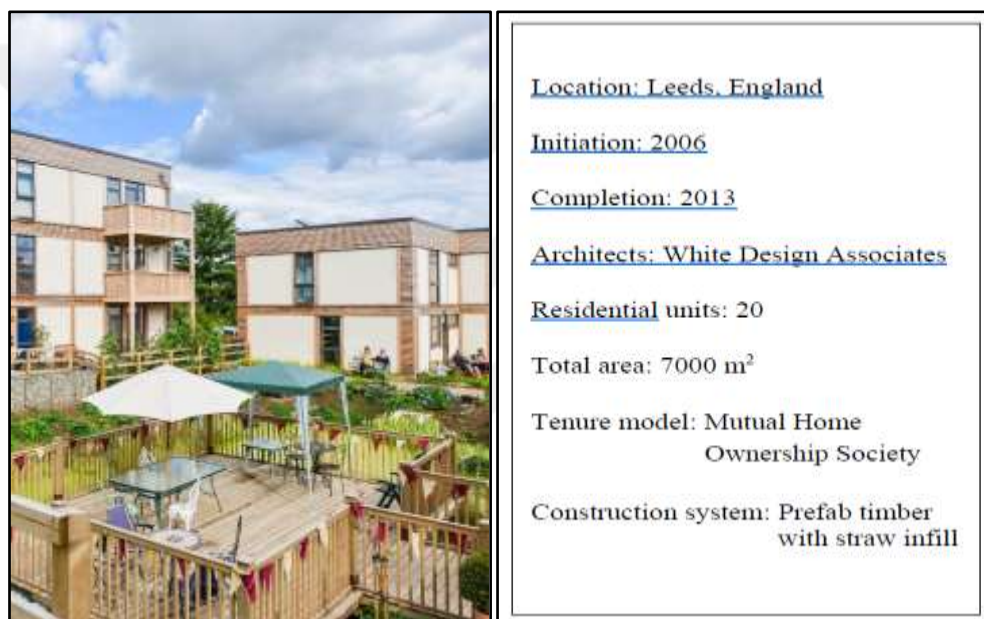


Figure 4.18: Lilac (LILAC, 2019).

4.2.1 Architectural Concept

The concept was developed in 2006 to find a better community with common ideals and a better environment for raising kids (J. Lawton, 2019). The agenda also included concepts like affordable, low impact living, preventing social isolation, and cooperative living (Hopkins, 2014). In 2009, The Lilac initiative was formally launched by a small number of people (Chatterton, 2013). According to Chatterton, the initiative faced three primary obstacles after 2011: to address the 2008 financial crisis (by being affordable), to address climate change and to rebuild social harmony following the riots in England in 2011 by responding “at a community level” (TEDx Talks, 2013). Additionally, Chatterton identifies

three primary problems with the traditional housing concept (Hopkins, 2014). Its ecological footprint is large. It does not promote social interaction and is not affordable. In contrast, it encourages “corrosive individualism” using the model of owner-occupancy (Hopkins, 2014). Therefore, Lilac seeks to offer “a direct response” to each of these problems (Chatterton, 2014).

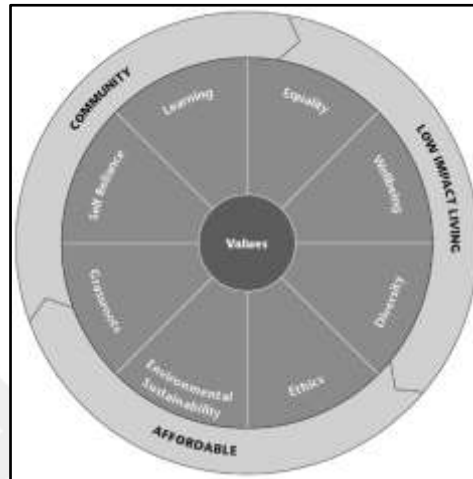


Figure 4.19: Values of Lilac (Chatterton, 2014).

4.2.2 Design

White Design Associates developed the project's design, and it is made up of 20 residential units divided across five blocks, ranging in size from one-bedroom to four-bedroom homes, centered on a common house and a pond (Chatterton, 2014; Hopkins, 2014). Lilac's residential units are smaller than the national average; however, they are adequate in common areas. Here is how Joe Atkinson describes the concept of living in a smaller residence in his case, a one-bedroom apartment with shared amenities:

Living somewhere like this where we [share] a communal house and everything else, is preferable to all of us living in enormous mansions. Since I have access to all [the] common assets, I don't need to live in a large home (E. Lawton, 2019).

A two-story common house, a playground, and an allotment garden that faces a small park are all communal areas in Lilac (Chatterton, 2014; Hopkins, 2014). Since the community encourages environmentally friendly transportation (e.g., carpooling, cycling), there are only five parking spaces in each of the two parking spaces near the site's boundaries (Hopkins, 2014; LILAC, 2021).

Correspondingly, there are bike parking spots (Chatterton, 2013). A washing room, mail room, office, workshop, multipurpose room, shared kitchen, and dining room are all part of the common house (Chatterton, 2013; LILAC, 2021). The local community can also use most of the facilities in the common house (Chatterton, 2013).



Figure 4.20: Master Plan of Lilac (LILAC, 2021).



Figure 4.21: Photos from the Common House.

(<https://www.harperperry.co.uk/news/thoughts-on-lilac-2>; LILAC, 2021)

A circular common house of about 200 m² is surrounded by 20 flats of various sizes, ranging from 58 m² to 112 m². In order to maximize solar gain, all the units will face

south and have passive ventilation. The drawing below shows an example layout of a one-bedroom studio apartment, front elevations, and an indicative site plan on a 0.7-hectare plot. A possible location in inner-west Leeds served as the model for this. The development will be able to serve as a multi-age, multi-need community because of the variety of home sizes and types. The unit sizes shown below are as follows:

Table 4.1: Housing Unit Type and Size (LILAC, 2019).

Type	Property type	No.	Area (sq. m)
A1	1 bedroom 2 person flat	6	58
A2	2-bedroom 4 person flat	6	78
B1	3 bedroom 5–6-person house	5	90
B2	4-bedroom 6–8-person house	3	112
	Total	20	1,602

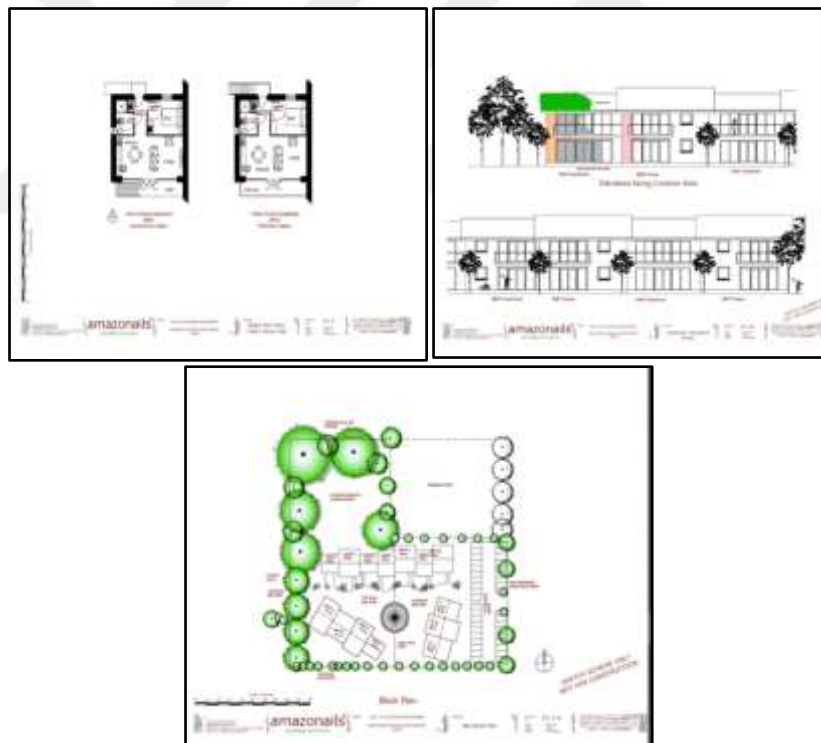


Figure 4.22: Example Layout of a One Bedroom Studio Apartment (LILAC, 2019).

4.2.3 Circulation

The layout of the housing blocks and common areas enhances movement within the community. Pathways connect each home to communal spaces without compromising privacy, encouraging daily interactions among residents. This circulation design supports the project's goal of fostering a strong community bond while remaining functional and accessible

4.2.4 Materials Used in Construction

A straw bale building can be constructed using a wide range of materials. The following table lists as many of them as feasible along with their embodied energy values (Hammond & Jones, 2008).

Table 4.2: Materials Used In the Construction (Hammond & Jones, 2008).

Material	Embodied Energy (MJ/Kg)	Embodied Carbon (Kg C/Kg)
Aggregate	0.10	0.005
Straw	0.24	0.01
Plywood	15.00	0.51
Slates	1.00	0.056
Clay	3.59	
Timber 2x glazed, argon filled, window	360	18
Lime	5.30	0.74
Wool (recycled) insulation	20.9	
Paint (2 coats)	20.4	1.06
Rubber	120	42
Sand	0.10	0.005
Rammed earth	0.45	0.023
Softwood	7.40	0.45
Steel	24.4	1.77

4.2.5 Cost-Effectiveness

The cost-effectiveness of LILAC's construction is deeply embedded in its sustainable and community-oriented approach. Despite some initial higher expenses due to sustainable building materials and energy systems, the project demonstrates considerable long-term cost savings and environmental benefits. The initial decision to use sustainable materials

like straw and timber aimed at minimizing environmental impact while supporting local supply chains. Straw and timber, chosen for their low carbon footprint and high carbon sequestration capacities, were integrated through the prefabricated ModCell system, a timber and straw bale construction method. ModCell's advantages included structural durability, insurance ease, and quicker assembly compared to traditional straw bale construction, though it was more costly than conventional methods like brick and block (Chatterton, 2013, p. 1660; Hopkins, 2014). Although ModCell was a more expensive upfront choice, standardizing the construction of each home contributed to overall cost reductions, as it enabled efficient prefabrication and faster onsite assembly (Chatterton, 2014).



4.3 CASA REAL AFFORDABLE HOUSING PROJECT IN BEIRA, MOZAMBIQUE

Affordable housing remains a critical concern in many urban areas worldwide, particularly in rapidly urbanizing regions where socio-economic inequalities exacerbate access to safe and dignified living conditions. In Beira, Mozambique, the Casa Real Affordable Housing Project exemplifies a pioneering approach to providing cost-effective and sustainable housing solutions for low-income families. This case study explores the project's architectural concept, design features, construction strategies, cost-effectiveness, and social impact, drawing parallels to the globally recognized Quinta Monroy project in Chile (The Evolving Process of Incremental Social Housing in Chile, 2014). By examining Casa Real, we can extract lessons and best practices to inform similar affordable housing initiatives in other contexts.

Project Information

Location: Beira, Mozambique

Initiation: 2017

Completion: Ongoing

Developer: Casa Real in collaboration with Reall

Residential units: 600+ units planned (phased development)

Total area: Approximately 50 hectares

Tenure model: Freehold and rent-to-buy schemes

Construction system: Locally sourced materials and prefabricated components, designed for incremental expansion

The case study focuses on the port city of Beira, located in the central region of Mozambique. With more than 550 000 residents, Beira is the biggest city in the Sofala Province and the fourth most populated city nationally. A number of climate change and coastal adaptation projects have been piloted in this city due to its vulnerability to extreme weather events. These include the Strategic Program for Climate Resilience of the Government of Mozambique, the Cities and Climate Change Project of the World Bank, and, more recently, Casa Real's climate adaptation initiatives

4.3.1 Design Features of Casa Real in Beira, Mozambique

The Casa Real project incorporates several innovative and adaptive features to tackle the challenges of affordable and resilient housing in Beira, Mozambique. Below are the key design features:

4.3.1.1 Incremental housing approach

Casa Real adopts an incremental housing model, providing homes with a basic core structure that can be expanded as the homeowner's financial capacity improves. For instance, a one-bedroom starter home is built on a foundation designed to support future expansion to two or three bedrooms (Jones & Stead, 2020).

4.3.1.2 Smaller plot sizes

To address affordability challenges, Casa Real reduced plot sizes from the standard 600 square meters to 100–150 square meters, significantly lowering costs while maintaining functional living spaces. This was achieved in partnership with the Beira Municipal Council (Nkhonjera, 2020).

4.3.1.3 Energy-efficient and climate-resilient designs

- a. Design features: Homes feature natural ventilation, passive cooling systems, and high-quality materials for durability.
- b. Resilience to Cyclones: Following Cyclone Idai, Casa Real improved its roofing designs using long screws, reinforced timber gussets, and galvanized metal straps to enhance cyclone resistance (Nkhonjera, 2020).

4.3.1.4 Affordability through diverse typologies

Casa Real offers housing solutions for middle and low-income earners, with prices per house starting from \$10,000 for starter houses to \$50,000 for bigger units. The approach uses a cross-subsidization model, in which money from expensive houses helps reduce the cost of cheaper houses (Nkhonjera, 2020).

4.3.1.5 Holistic urban development

The housing is developed as part of an integrated urban plan so that the area is well-served with social infrastructure, including transport, education, and health facilities. This reinforces the flood-resilient scope of the Beira Master Plan (Nkhonjera, 2020).

4.3.1.6 Material efficiency

Components are made from locally sourced materials and include things like galvanized roofing sheets and concrete blocks to ensure that the structure is strong, durable and affordable. Casa Real employs materials based on sustainable material sourcing strategies (Nkhonjera, 2020).

4.3.1.7 End-user financing

Low mortgages, rent-to-buy schemes and phased payment plans are flexible financing options to help low-income buyers purchase homes. This has solved the gap in Beira's housing market where property is measured at an affordable price (Nkhonjera, 2020).

4.3.2 Architectural Concept

Casa Real is rooted in the concept of architecture, devising a house that is adaptable, and the development of the house is incremental. Casa Real also uses something called “core housing” to help meet the needs of low-income families. This approach provides a fundamental and practical unit that can then be enlarged by the homeowner as they acquire more funds in the future.

House selection at Casa Real is intentionally situated to increase community interaction and connectivity. Each unit opens directly onto a shared street that encourages interaction between residents. All units are fronted by at least one street (most by two) in the project layout, enhancing connectivity with the community. The design intent of creating view corridors and connectivity between the structures for easy pedestrian movement on-site is successfully achieved with the main road positioned centrally within the grid. Not just that, this alignment also supports the need for functional aspects of the neighborhood but also serves the greater aim of building a strong and cohesive community (Nkhonjera, 2020).

The effectiveness of the design lies in the way it balances individual comfort, efficiency, and convenience while keeping basic needs like living rooms, bedrooms, and sanitary facilities at the forefront. The flexible floor plans allow residents to modify their homes to suit changing needs in the future. The project also draws from vernacular architecture, including shaded terraces and natural ventilation, to provide homes that are responsive to the cultural and climatic context of the Beira environment (Jones & Stead, 2020).

4.3.2.1 Casa real inhamizua master plan

The Casa Real Inhamizua Master Plan is broken into various parts as it is described as “a vision for an integrated housing development” to cater to low- to middle-income earners, with a goal of a sustainable, affordable development. The project, which is a first in Mozambique as it will be financed through private-sector housing schemes, aims to develop 200 affordable houses. The Master Plan is composed of 11 stages, and each one of them is critical to the overall development of the scheme (Nkhonjera, 2020).



Figure 4.23: Casa Real Inhamizua Master Plan (Nkhonjera, 2020).

“The houses are planned with attention to all factors, including finances.” The housing plan seeks to create a cohesive neighborhood through a mix of housing types at a range of prices. Houses come in different types, from homes priced at \$10,000 for beginners, which can be upgraded to worth up to \$50,000, when their owners have the money for it. Moreover, the plan is focused on affordability and integration, as he proposed to use smaller plots (100-150 m²), support densification and connection with transport systems,

social infrastructure, and shopping centers. The municipality has approved these elements to make a sustainable and affordable development (Nkhonjera, 2020).

The development emphasizes resilience through features like stronger roofing, durable building materials, and effective drainage. Casa Real ensures fundamental infrastructure, such as roads, energy, water, and sewage systems, as well as a safe and sustainable environment.

4.3.2.2 Model for incremental housing

The foundation of Casa Real's business strategy is the notion of designing, building, and selling homes for middle class clients. Thus, the incremental building method is used in the affordable housing project. Its housing type consists of several kinds of dwellings with one, two, and three bedrooms. Building gradually while making sure each increment is complete and habitable with basic facilities (including a built-up foundation for incremental expansion) is the foundation of these developments. Additionally, infrastructure can be built and gradually connected to the site and, eventually, to the house. Additionally, Casa Real's constructions are sturdy powerful to support a second floor (Nkhonjera, 2020).

4.3.2.3 Building typology

The Casa Real affordable housing project in Beira incorporates multiple housing typologies designed for low to middle-income families. These typologies prioritize affordability, incremental expansion, and adaptability, catering to diverse financial and space requirements.

Casa básica

Type 0:

- I. Sale price: \$10,000
- II. Size: 26.86 m²
- III. Features: One bedroom, kitchen, bathroom, and a built-up foundation with a slab for future expansion to a Type 2 unit.



Figure 4.24: Casa Real Housing Typology Básica Type 0 (Nkhonjera, 2020).

Type 1:

- I. Sale price: \$20,000
- II. Size: 46.70 m²
- III. Features: One bedroom, living room, kitchen, bathroom, and provision for expansion to a Type 2 unit.



Figure 4.25: Case Housing Typology Básica Type 1 (Nkhonjera, 2020).

Type 2:

- I. Sale price: \$30,000
- II. Size: 58 m²
- III. Features: Two bedrooms, living room, kitchen, bathroom, and built-in infrastructure for further adaptability.



Figure 4.26: Case Housing Typology Básica type 2(Nkhonjera, 2020).

Casa maior

Type 1+:

- I. Sale price: \$40,000
- II. Size: 56.10 m²
- III. Features: One-bedroom, large living room, kitchen, bathroom, and structural provisions for expansion to Type 3.



Figure 4.27: Case Housing Typology Maior type1+ (Nkhonjera, 2020).

Type 3+:

- I. Sale price: \$50,000
- II. Size: 82 m²
- III. Features: three bedrooms, a large living room, a kitchen, a bathroom, and all the basic structures, which can be further developed in the future to suit the needs of a larger family.



Figure 4.28: Case Housing Typology Maior type1+ (Nkhonjera, 2020).

4.3.3 Circulation

The Casa Real Inhamizua project is a good example of how circulation can be well-planned to achieve good accessibility to space and be integrated with the local community so that it can be used by the same. The roads and public spaces are designed to establish links and connections between the housing units to the facilities and the rest of the city. Convenience through well-designed roads and pathways the layout of the area was made thoughtfully, allowing the location to be easily accessible (Nkhonjera, 2020).

Each residential unit is designed with a front yard, a parking area, and a backyard. Further, the plan overlaps circulation networks; the social infrastructure and shopping are organized around public circulation. Namely, the construction of basic attributes such as block-paved roads and runoff methods, which promote public circulation, especially in a city such as Beira, which is constantly prone to flooding (Nkhonjera, 2020).

4.3.4 Materials Used in Construction

Casa Real prefers the use of high-quality building materials for the durability of the construction, sustainability, and longevity of residence.

The materials used:

- a. Concrete Blocks: These are made on-site, helping to cut down on costs and ensure that they are of decent quality.
- b. Galvanized Roofing Sheets: They are bought directly from our local factories while we are making some changes to make them stronger. Adjustments were made such as making the sheets thicker and replacing nails with long drive screws so that they were safe and cyclone-proof.

- c. Gravel: Has been transported from as far away as 150 kilometers to make sure they met the quality criteria expected for construction.
- d. Timber Gussets: Fastened with galvanized metallic straps to enhance the strength of roof construction.
- e. Insulation: Incorporated into the roofing system to limit solar gain and consequently keep internal temperatures lower.

The materials were selected to be cost-effective yet resilient, so homes would buck the trend of Cyclone Idea and other extreme weather events.

4.3.5 Cost-Effectiveness

Completion of Incremental Housing: The homes are built through incremental phases starting with a basic structure that the family can grow as their income allows. It keeps the homes affordable for buyers in the beginning but also enables them, should their needs change in the future, to expand their homes in line with the requirements of lives lived within them (Nkhonjera, 2020).

Casa Real contacted the Beira Municipality, where it successfully lobbied for a city regulation that usually imposes a minimum plot of 600 square meters to be changed.

Casa Real managed to persuade the municipality from the plot size of 100–150 square meters. This resizing drastically reduced the price tag of the land, enabling the project to be implemented in a more feasible and economically viable manner. Simultaneously, it raised housing density, enabling more units to be built in the area that was being developed (Nkhonjera, 2020).

Efficient Supply Chain: Casa Real follows an efficient supply chain process by procuring materials directly from factories and suppliers. For example, the company is sourcing galvanized roofing sheets and concrete blocks directly from local manufacturers, driving down price with the same quality. Such measures include sourcing materials within the same compound to facilitate the procurement process. Casa Real also uses solar-powered technology to be more energy efficient and cut operational costs, keeping high-quality and affordable housing (Nkhonjera, 2020).

Cross-Subsidization: Casa Real employs a cross-subsidization model by providing a variety of housing types. A significant portion of the infrastructure and management costs is subsidized through revenue generated from the more expensive units targeted at middle-income buyers. This approach, in turn, helps reduce the costs of affordable units for low-income families, making housing more accessible across different income groups (Nkhonjera, 2020).

Partnerships and Financing Models: Casa Real has strengthened its operations through partnerships with organizations such as Reall and local banks. These alliances provide innovative financing options for homebuyers, including schemes such as "pay-as-you-go" and "rent-to-own." These models make housing more accessible by accommodating the financial capacities of low- and middle-income buyers, fostering inclusivity in homeownership. These strategies ensure that Casa Real homes remain affordable while maintaining quality and resilience (Nkhonjera, 2020). These strategies ensure that Casa Real homes remain affordable while maintaining quality and resilience.

4.4 EVALUATION OF THE CASE STUDY

Based on the projects for affordable housing solutions, a mixture of characteristics integrating community-driven sites and designs as well as incremental housing models where stepwise construction can take place while ensuring a sustainable living environment are revealed to be an idea holistic approach in addressing urban housing crises across developing regions. The projects I studied, from Quinta Monroy to LILAC and Casa Real Inhamizua, reflect a variety of strategies responding to different socio-economic and cultural contexts. In this analysis the study will assess these projects and argue how their principles of design and affordable building methods may be applied towards the development of affordable housing in Mogadishu, Somali for low-income communities.

4.4.1 Contextual Framework and Relevance

One of the major issues facing Mogadishu is urbanization, which has led to people's displacement and socio-economic difficulties. The International Housing Coalition analyzed this challenge and proposed solutions that take into consideration the scarcity of materials, climate resilience, and cultural sensitivity. Mogadishu serves as a good case study for affordable housing projects, particularly in Africa, where low-cost houses and incremental construction methods are crucial due to economic and environmental conditions (UN-Habitat, 2020b).

These projects are characterized by efficient design, community participation, and adaptability to cultural and environmental factors. They also draw lessons from successful international examples, making them an important model for affordable housing solutions in developing countries.

4.4.2 Design Adaptability and Incremental Construction

The study includes strategies of design flexibility and incremental construction that have proven successful in other projects such as Quinta Monroy (Chile), LILAC (Leeds), and Casa Real Inhamizua. The powerful design approach in this curious project can provide the economy for the scarce processing in Mogadishu. Its idea is to build a simple structural framework that serves the basic needs of its inhabitants and can be developed as funds

become available. The method guarantees that affordable houses are built while allowing residents to make extensions or additions as their financial situation allows.

In addition, this form of housing is culturally relevant as it allows families to expand their housing units to fit more family members in socio-cultural contexts where extended family ties remain a core dimension (World Bank, 2018). The open nature of the architectural designs and room layouts make it easy to add rooms, while residents have the freedom to adjust their homes according to their cultures and family structures. This approach is still relevant for now, as is evident in Mogadishu (Habitat for humanity, 2016).

4.4.3 Cost-Effectiveness and Economic Feasibility

Affordability is a critical consideration in case studies, incorporating measures that reduce both the up-front and overall financial burden on residents. By applying incremental construction, the initial cost of building is lowered, making it accessible to families with stable incomes but limited savings. This approach also allows for incremental spending, which is particularly crucial in Mogadishu, where access to long-term housing finance is limited (CAHF, 2020).

In addition, the proper management of materials also helped reduce costs. For example, the use of clay, bamboo, and stabilized earth blocks minimized expenses typically incurred in transporting building materials. This approach aligns with projects implemented in many developing cities. The application of sustainable and locally sourced materials was critical in reducing both construction and maintenance costs while enhancing the energy efficiency of affordable housing, such as the low-cost prefabricated straw bale house developed by LILAC (Chatterton, 2013). Utilizing existing resources in Mogadishu, the case study demonstrates cost-effective delivery, allowing for local economic activity which further feeds back to housing and job creation.

In addition, a cost-effective participatory building model allows residents to contribute to play an active role in construction with love. Like the participatory process in Quinta Monroy, having residents directly participate in construction provides both ownership and savings on labor. It also ensures the sharing of important construction techniques within the local population and thus assists in long-term economic self-sufficiency.

4.4.4 Environmental Sustainability

Maintaining environmental sustainability remains in the project, with design decisions made that apply to Mogadishu's warm and dry climate. Through passive cooling measures like building orientation, use of natural ventilation and shading techniques to minimize expensive energy consumption against cooling. These largely passive measures reflect aspects of LILAC, where energy use was minimized through both passive design and active systems. Low utility bills were a direct result (Chatterton, 2014).

In Mogadishu, with little or no access to electricity and when available often with unreliable supply, the key is to avoid reliance on active cooling systems. Thanks to the project's passive design, homes stay comfortable year-round, even at peak heat times of the season without an expensive energy burden. Also, traditional sustainable materials such as stabilized earth blocks promote thermal insulation and indoor comfort.

The project also brings a third critical element: water management. To offset Mogadishu's lack of access to clean water, rainwater harvesting systems are integrated into these buildings for catchment and potable use. Other low-cost housing schemes have successfully deployed similar systems, including a sustainable urban drainage system (SuDS) in LILAC that reduces flood risk and allows collection of used water to use for irrigation (LILAC, 2021). However, if some or all these water conservation strategies could be applied to Mogadishu then many lives, I believe it would improve with the residents that live there, and they may stop undermining water sources.

4.4.5 Cultural and Social Relevance

One of the great hallmarks of this case study is that it has paid attention to cultural and social relevance, designing and laying out their design elements within the framework of what accommodates the needs and lifestyle of its people. Somali society often consists of families with multiple generations and the project accommodates this with extensions to the home suitable for multiple family members amongst one roof. It acknowledges regional traditions attaching great significance to family unity and assistance.

Common spaces like joint courtyards and gardens not only foster social togetherness but also complement classic Somali norms in conditions of social connation. The collective in LILAC similarly helps to build community, with communal spaces helping to promote

socialization between residents as well as meetings and recreation similar to the role of communal spaces in Quinta Monroy. In Mogadishu, where the role of social ties in resilience is a cultural reality, designing for communal interaction is not just culturally relevant but a necessity to strengthen neighborhoods as urban fabrics (Bonnet et al., 2020.).

4.5 CONCLUSION: APPLYING PROJECTS INSIGHTS TO MOGADISHU

Reviewing the cases of Quinta Monroy, LILAC and Casa Real Inhamizua are suggesting an assortment of approaches that could enhance affordable housing in Mogadishu. Providing both accessible and culturally appropriate solutions to the low-income community demand between incremental housing models and sustainable construction materials each captured deep learnings done. If these principles are applied, Mogadishu would be in a position to create affordable, resilient and sustainable housing for its most vulnerable.

The solution is used as a case study of how to provide flexible, phased housing solutions to satisfy urgent housing demands while also enabling tenants to make improvements and additions to their homes over time. Somali culture is quite similar to this; they frequently build their houses to accommodate large, extended families living under one roof. This strategy also aims at reducing the financial burden on Mogadishu's low-income families while promoting a sense of ownership and investment over an extended period. Additionally, the use of reasonably priced materials and passive cooling strategies contributes to the provision of adequate housing for the city's poorest citizens while preserving sustainability and comfort.

The evaluation makes it clear that community involvement, passive design, and local materials are essential components of affordable housing options (Sanoff, 1999). When put into practice, these ideas can offer a sustainable housing option that improves Mogadishu's appropriate living standards while also addressing social and environmental issues. According to this case study, these housing solutions are flexible and repeatable, and they may be applied to create inclusive and resilient communities as Mogadishu grows.

4.6 DISCUSSION

This research aimed to solve Mogadishu's affordable housing crisis by devising solutions taking into consideration Mogadishu's unique socio-economic, cultural, and political context. The goal of the research was to connect theoretical paradigms with actionable solutions for low-income communities by examining localized problems, as well as global best practices. This study has identified three interlinking areas critical to addressing the housing deficit in Mogadishu: (1) systemic nodes of action that can be identified within Mogadishu's economy, social fabric, governance, and other institutional frameworks; (2) successful strategies for incremental housing, community participation, and sustainable use of building materials from around the world, as gathered from projects from different countries; and (3) culturally and contextually relevant and scalable solutions that connect with Somali customs, traditions, and available resources.

The key implications of these findings will go from housing provision to a better understanding of urban resilience, equitable, and sustainable development in a post-conflict city. High land costs and informal settlements echo systemic inequities in built environment, whereas local materials, such as coral stone, which have been revived in high-end internal coastal designs, provide ways for housing to become affordable but also culturally significant. But contradictions appear even if incremental housing models from Chile's Quinta Monroy reduce costs; their potential for success in Mogadishu depends on navigating some complex clan-based land tenure systems in Somalia. Community-driven designs, like the UK's LILAC co-housing, will also need to adapt to Mogadishu's collective family structures and avoid infrastructural gaps.

From these perspectives, this Discussion section provides the tale of the findings interpreted via three lenses:

- a. Contextual Challenges: The intersection of Mogadishu's economic, social, aspiration and policy challenges with global housing inequity.
- b. Proposed Solutions: Scalable designs and policies.
- c. Stakeholder Roles: Highlighting the need for coordination across government, NGOs, and communities for implementation.

Based on these findings, the subsequent sections critically explore the implications of the recognized challenges. By positioning global lessons within Mogadishu's unique socio-economic and cultural context, this discussion provides a fertile base to mind the housing crisis. It also details the role of key stakeholders and outlines opportunities for embedding sustainable practices, policy-driven solutions, and community-based strategies into affordable housing development. In addition to interpreting the findings of this study, this discussion provides a roadmap for practical, actionable solutions. It presents the opportunity for Mogadishu to be a global exemplary of sustainable and inclusive housing solutions in a post-conflict urban environment. The following sections inspect the challenges and solutions proposed to combat the challenges identified, roles of stakeholders addressing.

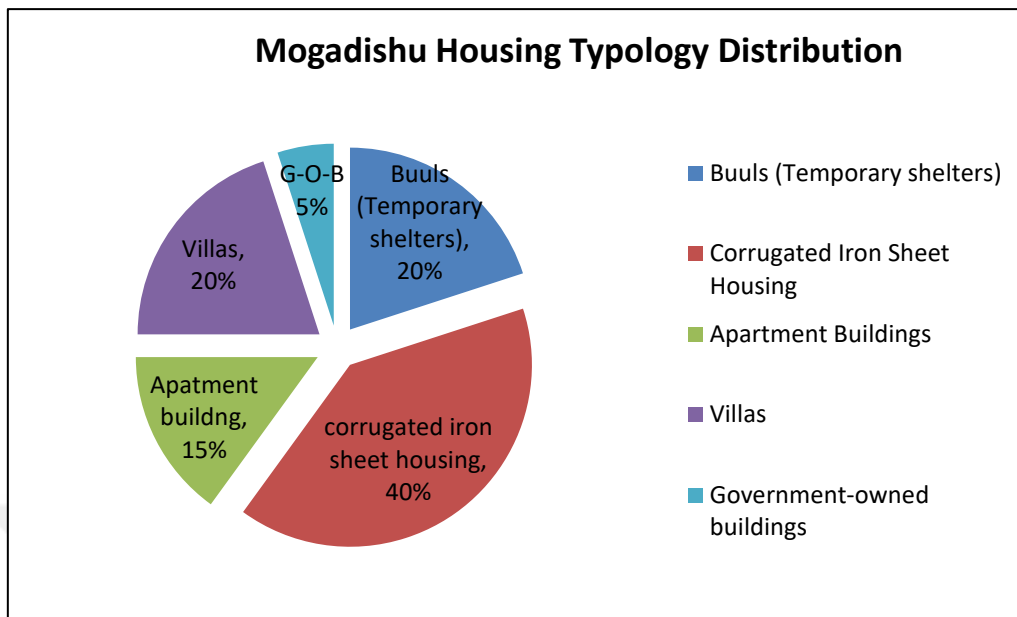
4.6.1 Discussion of Findings

In the discussion, the various challenges to affordable housing in Mogadishu are highlighted, and the necessity of strategic planning based on local application of global best practices is emphasized.

The study shows According to UN-Habitat, more than 40% of Mogadishu's population lives in informal settlements with poor hygiene, overcrowding, and almost no access to basic services. These informal settlements are evidence of the failure of the formal housing market, where high prices, limited funding sources, and the absence of affordable rental housing led to homelessness among the low-income population.

Economic constraints worsen the housing needs in Mogadishu due to high levels of poverty and unemployment rates which reduce the affordability. A large number of locals have incomes that fall below the poverty threshold and struggle to cover the costs of housing accommodations. Although diaspora remittances can provide financial support for many families, it also contributes to inflation when it comes to the housing market, thus increasing house prices and making them unaffordable to many who cannot get their hands on such money.

Chart 4.1: Mogadishu Housing Typology Distributions (by author).



In the study, “informal” housing is said to account for roughly 65% of Mogadishu’s housing stock (combined buuls (temporary shelters), corrugated iron sheet houses and government owned buildings), with formal types (apartments and villas) making up the remaining 35%.

The next section outlines the challenges in Mogadishu and proposed solutions for low income communities in Mogadishu such as incremental housing, culturally responsive design, and community-driven approaches to these challenges with the aim of supporting sustainable development for low-income communities.

4.6.1.1 Challenges in Mogadishu

This section brings together the core challenges that affect the provision of affordable housing in Mogadishu and highlight opportunities that could be acted upon considering the specific socio-political and cultural environment of the city. By critically exploring contradictions between global models and local realities, the discussion points toward pathways for aligning policy, practice, and community needs.

Mogadishu’s housing crisis is rooted in systemic economic challenges that disproportionately exclude low-income communities. Land speculation and the absence of formalized land markets have driven peri-urban plot prices up by 300% since 2015 (UN-

Habitat, 2022), pushing affordable housing out of reach for most residents. Compounding this issue, construction costs remain prohibitively high, with imported cement a material constituting 40% of building expenses subject to volatile global market prices. This reliance on imported materials creates a structural dependency that inflates project budgets and stifles local innovation.

The lack of accessible financing mechanisms further entrenches inequities. Formal banking systems fail to serve the majority, less than 5% of residents qualify for mortgages due to stringent collateral requirements, while microfinance initiatives tailored to low-income housing remain nascent or underfunded. These overlapping barriers speculative land markets, costly materials, and exclusionary financing will continue to trap over 60% of Mogadishu's residents in substandard informal settlements (UN-Habitat, 2020).

One of the study's key findings is that Mogadishu's land access and regulation faces major challenges due to weak legal frameworks, corruption, and informal land tenure systems. The lack of a clear legal structure results in disputes, with multiple legal systems customary law, Sharia law, and formal courts operating in parallel. Corruption within government agencies and courts further complicates land governance, allowing powerful individuals to manipulate the system.

Historical factors, including abandoned properties from the civil war and displaced people settling on contested lands, have fueled ongoing conflicts. The absence of a centralized land registry and the destruction of cadastral records make property validation difficult. Additionally, land speculation has driven up prices, making housing unaffordable for many residents. The informal nature of land transactions and rental agreements leads to frequent disputes and evictions.

The land market in Mogadishu is heavily influenced by speculation and a lack of regulation. Land prices have skyrocketed in recent years, driven by wealthy individuals, businesses, and international organizations willing to pay high prices. This unregulated real estate market has made land and housing unaffordable for many residents. Additionally, irregular acquisition of public land by private actors further distorts the market, limiting access for lower-income groups. The rental housing sector also operates largely informally, with little government oversight. Many rental agreements are undocumented, leading to

frequent disputes and evictions, while public notaries, who are supposed to certify land transactions, are often bypassed due to bureaucratic inefficiencies and costs.

The monopolization of the city's housing market is also being driven by a combination of clan power, organizational interests and private real estate developers, driving low-income communities out of prime housing areas. Clan-linked considerations control property ownership and access, creating spatial inequities and inhibiting economic and social integration. Soaring land prices, fueled by competition with the Somali diaspora, are forcing already vulnerable populations to the edges of the city. The weaknesses of this system reflect the underlying historical enmities and tribal dominant control which must not only be recognized with the creation of equitable and inclusive policies but also highlight the need to ground decision-making on a systemic level within a cultural context.

To address these issues, Mogadishu needs comprehensive policy reforms, stronger legal institutions, and a transparent, centralized land registry. Without these improvements, land disputes, market instability, and displacement will continue to hinder sustainable urban development.

4.6.1.2 Proposal for affordable housing solution for low-income communities in Mogadishu

The challenges which have been discussed in the discussion section show that it is crucial to find innovative and context-specific solutions to the problem of affordable housing in Mogadishu. These barriers from economic and policy barriers to cultural biases highlight the failure of current approaches and the need for new approaches that focus on equity, sustainability, and cultural sensitivity. This final section follows from identifying these challenges by proposing workable solutions for Mogadishu's specific urban context. Design-based solutions, community-based approaches, and the role of government policies are the key topics of this section, which aims to offer a systematic approach to removing barriers and creating decent, affordable housing systems for low-income communities.

Design-based solutions

The study suggests incremental housing models as a flexible and cost-effective solution to Mogadishu's housing challenges. These models enable families to construct homes in

phases, beginning with a basic core unit that can be expanded over time. This phased approach minimizes initial costs, making housing accessible to low-income communities while fostering a sense of ownership and personalization. Architects advocate for incremental housing as a sustainable alternative for resource constrained settings, emphasizing its adaptability to household needs and economic conditions.

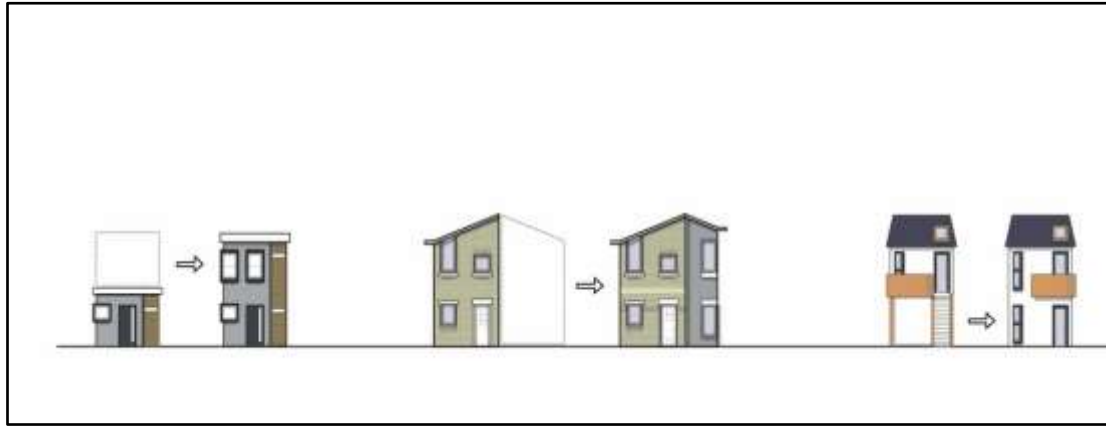


Figure 4.29: Incremental Housing Model (Module Design).

In the context of Mogadishu, this kind of incremental housing model is a pragmatic solution to the challenges of housing, and a replicable solution. This approach makes sense with the economic realities of many residents and provides families with a path to progress, allowing them to begin with an affordable core unit and grow as their financial and social conditions allow. Additionally, integrating traditional Somali architectural aesthetics into these modifiable structures helps maintain cultural relevance and acceptance. Open courtyards and other communal gathering spaces can be easily incorporated in a way that reflects local customs and promotes social cohesion.

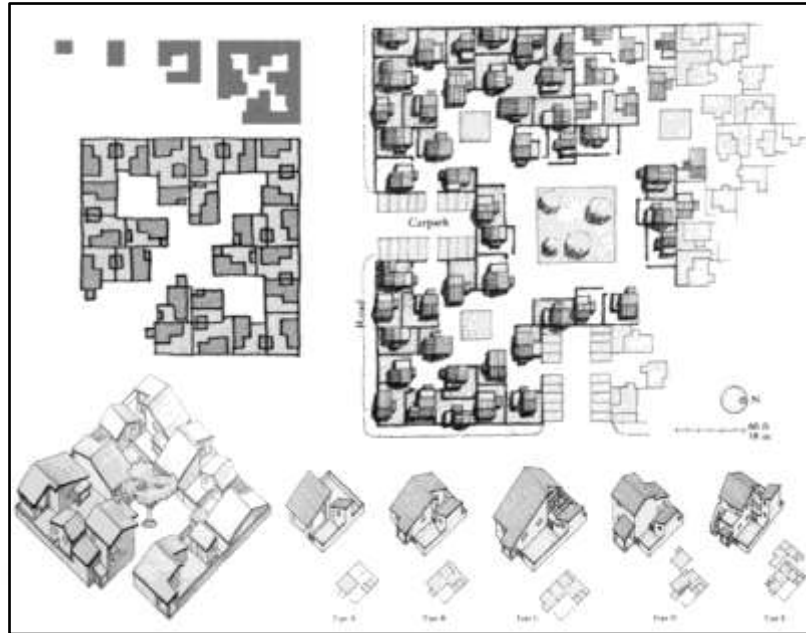


Figure 4.30: Example Design of Neighborhood Units and Building Blocks with Incremental Development Capability (Bemanian & Azizibabani, 2019).

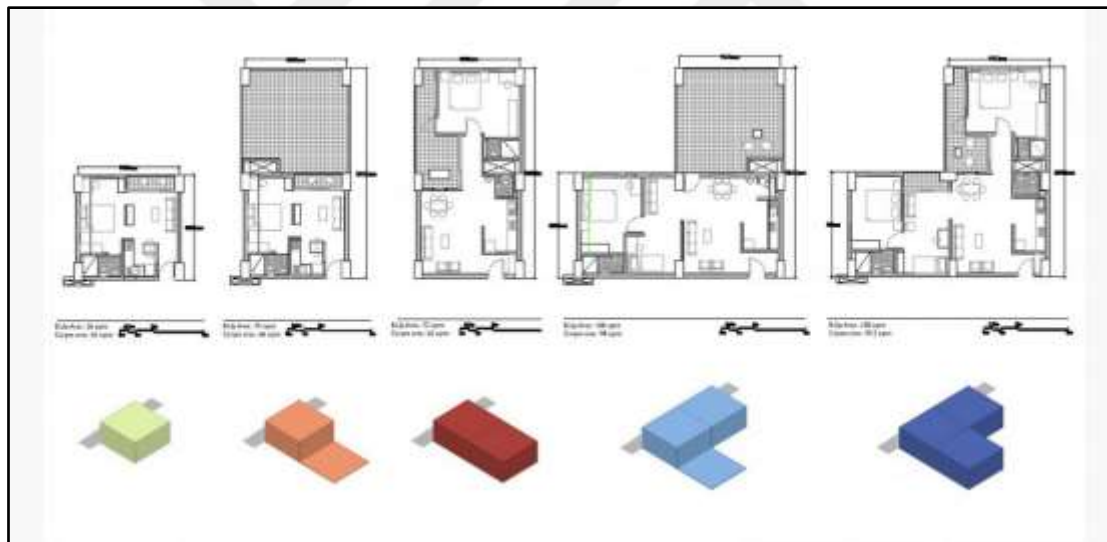


Figure 4.31: Example of Incremental Housing Units Plan (Chauhan, 2020).

In incremental housing models, the residents first purchase a basic core unit that is built with the potential to include more space in the future. The core unit is considered the primary living space and the expansion areas that are identified are the user's until they decide to develop them. As families' needs and resources grow over time, these reserved spaces can be developed to form part of the house while the occupants can adapt the house to their growing needs. This approach offers flexibility and affordability, which allows people to add expansions to their homes when they can afford to. A good example is the

Quinta Monroy project in Chile where residents started with the basic living spaces and then slowly expanded their homes to suit themselves.

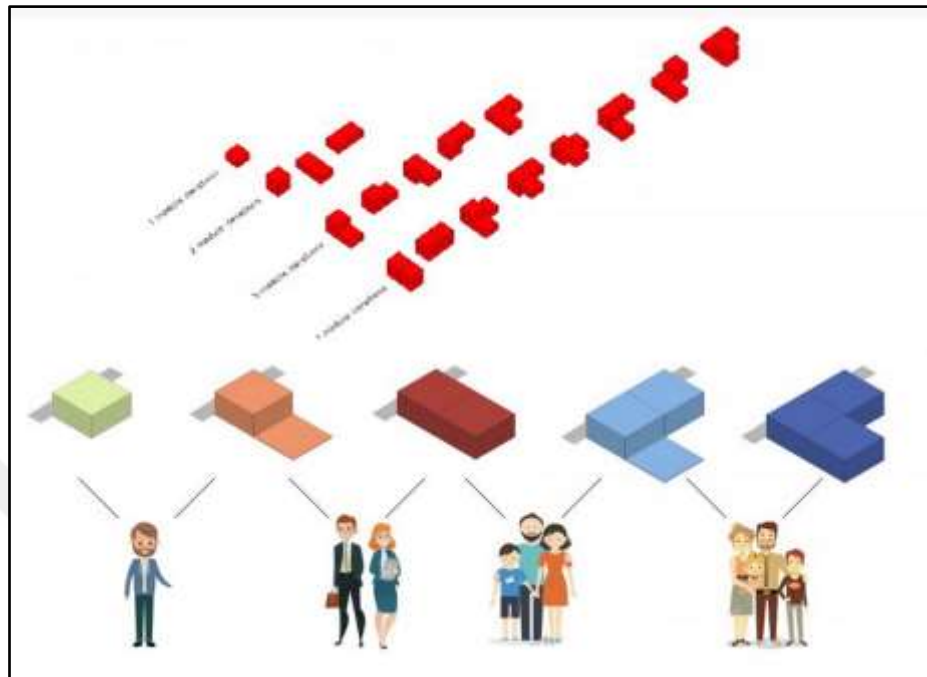


Figure 4.32: Example of Incremental Housing Unit Users (Chauhan, 2020).

As for sustainability, resource constrained settings architects support incremental housing as a sustainable option, and for its capability to be tailored to household needs and economic conditions. It is not only cost effective in the initial construction but also allows residents to contribute and make changes in their homes in a way that leads to stronger and more active communities.

The study also suggests the use of sustainable materials. Locally sourced limestone, mud bricks, and coral stone are abundant in Mogadishu and offer environmentally friendly and cost-effective alternatives to imported construction materials. These materials not only lower expenses but also maintain cultural and environmental harmony. Passive cooling techniques, such as strategic building orientation, cross-ventilation, and shaded courtyards, further enhance sustainability by reducing energy demands and improving thermal comfort, aligning with Mogadishu's climatic conditions.

Culturally aligned designs are crucial for ensuring long-term acceptance and functionality. Traditional Somali architectural features, including open courtyards, gender-segregated

spaces, and areas for communal gatherings, should be integrated into modern housing solutions. These elements reflect local customs and strengthen social cohesion, making the housing more adaptable to community needs. As architects highlight, combining traditional elements with modern sustainability practices ensure that housing designs remain relevant, functional, and culturally respectful.

Community-driven approaches

Community based approaches are important for the effectiveness and sustainability of housing solutions in Mogadishu. This is because participatory planning processes that involve community members in decision making ensure that housing projects meet the needs and preferences of residents. This collaborative approach leads to better project outcomes, and a feeling of ownership and accountability for the project and its future maintenance.

The involvement of residents does not end at the planning stage. The involvement of residents in the construction and management of their housing projects is a way of building social bonds and increasing local capacity. For instance, community led construction activities, to some extent like the Casa Real project in Mozambique, enable residents to participate in the construction of the areas in which they reside. This approach also saves costs and, in addition to that, enhances the community members' pride and responsibility.

Role of government policies

In chapter 2 the study claims that the government policies are the most significant factors that influence the supply of housing and its affordability (UN-Habitat, 2020b). In terms of housing policies, the government can sort out both national and local housing requirements in a rather professional and structured way with the help of effective housing policies. For example, the government should also reduce bureaucratic delays and expedite the project approval process as such inefficiencies are known to increase housing costs. It also means that housing policies should enable incremental building, so that low-income families can build houses incrementally as they can afford.

In terms of land policies, the study suggests that controlling urban land prices is important in managing the costs of housing. The government can follow successful global examples like Ulm, which has a policy of public land ownership to prevent speculative practices and

to have land available for affordable housing. Likewise, land-use reforms such as removing exclusionary zoning and incorporating inclusionary zoning can improve social cohesion while also boosting housing supply. For example, inclusionary zoning policies that are mandatory, like those in Los Angeles, do require developers to include a portion of their housing for low-income households.

The study suggests that improving the infrastructure is a key to enhancing housing affordability and accessibility. To unlock low-cost housing areas in the periphery, what is needed are better roads, public transport, and utilities. These systems' investments decrease travel time and costs and, therefore, connect peripheral neighborhoods to jobs and services. The role of coordination between government agencies, private investors, and international donors is essential to synchronize infrastructure with housing and urban planning goals.

5. CONCLUSION

This chapter includes a summary of the study, findings and discussions, implications for practice, and recommendations for further research.

According to the study, Mogadishu, a rapidly growing city with numerous problems, is also having trouble finding affordable housing for its low-income communities. Through ethos and logos, the care report contains some key findings that reveal some of the complexity of affordable housing including its impact on surviving populations of people vulnerable to housing and systemic barriers leading to housing. In order to address the housing situation in Mogadishu, the study presented an in-depth identification of the elements that define affordability and accessibility and the scope for change.

Housing has always been considered as one of the fundamental human needs, providing this fundamental need has been a challenge in many parts of the world. The history shows that the problem of the lack of affordable housing has become more serious over decades, particularly in urban areas due to population growth, inequality, and poor infrastructure. From the analysis of the historical evolution of affordable housing globally, it was seen that developed countries have dealt with similar challenges in the past, particularly during the post-war periods of reconstruction. These historical lessons are particularly relevant for Mogadishu, it is an area that is characterized by the accumulation of socio-economic risks and weak governance has hindered efforts to deliver adequate housing.

In addition, research found that housing affordability crises are not simply economic or structural in nature but instead are deeply ingrained in systemic inequalities that disproportionately impact low-income populations. Land prices, which are higher than the average income of the majority of the population, restrict access to financing, and poor (or lack of) urban planning strategies are major contributors to the housing inadequacy in Mogadishu. A large section of the city's population consists of slum dwellers that commonly live in squalid and overcrowded quarters and cannot benefit from proper facilities. This situation represents a serious challenge to public health, social stability, and the very sustainability of the urban environment, making a case for rapid and effective action on this front.

A key contribution of this study is its examination of Mogadishu's unique urban context. The study also provides detailed insights into the socio-economic, cultural and environmental factors that define housing demand and affordability across the city. This analysis showed that the problems facing Mogadishu are many and interconnected yet can be solved. Specifically, the post-war housing policies of the developed nations have shown how strategic planning, policy interventions and community engagement can significantly enhance the availability and quality of housing.

The results of the study provided an in-depth understanding of the intermediate structural elements and personality responsible for the city of Mogadishu housing problem, revealing some of the common reasoning of the people living in the area. The relationship between clan power, organizational interests, and private real estate developers strongly impacts the property market of the city. These actors bear responsibility for the exclusion of low-income communities from main housing locations. Land prices in some parts of Mogadishu are particularly high, where a plot can go for millions of dollars and well out of reach for most people. The prices of the houses for rent and the land became high as well due to stiff competition over the housing forced by the arrival of the Somali diaspora usually seeking safe and good accommodation. As a result, vulnerable communities have been displaced to the outskirts of the city.

The pattern of clan power remains an important factor in land ownership and access to housing in Mogadishu. Clan-linked considerations dominate decisions on access to property, market-related decisions like who is allowed to buy or sell, and also the right to occupy specific properties, rendering the system exclusive and fragmented, according to this study. Those who are not part of the ruling clan are still barred from entering certain neighborhoods that restrict their social and economic integration and turn inequality into the fabric of their eras.

This dynamic is compounded by clan-based historical hostilities and conflicts that have been translated to the social environmental landscape, actively producing spatial inequalities through residential patterns. Clans typically control large amounts of land, and decisions on how best to manage, develop, or allocate it are largely made by the clan's internal structure, with its needs taking precedence over those of the public.

Addressing this issue requires delicate and thoughtful policies that promote equality and inclusivity while respecting the cultural context of society. Such policies must aim to balance social cohesion with fair access to resources, ensuring a more equitable urban environment.

Another important finding is the lack of government policies involved in addressing the highlighted challenges as they arise. This has been compounded by the absence of effective governance structures or enforcement mechanisms that could have addressed land tenure, building codes, land registries and zoning regulations to regulate urban development and land ownership.

The limited ability of municipal governments to manage urban growth has resulted in the rapid increase of slums and overcrowded housing, leaving the poor, who are often forced into these substandard living conditions. This unequal distribution of land and lack of ownership rights contribute significantly to the housing crisis in Mogadishu.

Another important factor that has shaped Mogadishu's housing market has been private real estate developers working in an unregulated environment. These actors mainly deal in the upper segment of the market, targeting well-to-do consumers and returnees from the diaspora who expect safe and well-equipped houses.

Although those investments contribute to economic growth, including by creating new jobs, they also raise the prices of land and housing. This increase in price makes it harder for lower-income populations to find affordable housing, which worsens the housing crisis in Mogadishu. The dual burden of skyrocketing rents and high property prices is threatening the livelihoods of low-income earners, many of whom are unable to buy housing. In the central districts, rent frequently reaches over \$600 per month, a nonsensical price for vulnerable groups and those with a dubious way of life. This caused landlords to favor richer tenants with the highest rents possible, which only heightened the abuse of those who would pay for higher rents and severely weakened poorer groups' opportunities.

As the goal of this study was to find a solution for low-income communities in Mogadishu, it suggests enhanced tenant protection laws and rent control policies to strike a balance between landlords and tenants in the housing market. To future-proof the affordable

housing pipeline, the government must prioritize small- and large-scale housing developments that will close this divide. A comprehensive policy with incentives for landlords and mandates to keep a minimum percentage of units for low-income tenants could create a fairer housing market. The government must promote investment in affordable housing, with safeguards to prevent exploitation, to stabilize the housing situation and to assist vulnerable groups in the city.

NGOs have been central to providing emergency shelter and raising awareness of the rights of displaced people in Mogadishu. But their strategies are mainly focused on working to meet the immediate needs of the affected population within an existing framework and often in collaboration with government authorities, making rapid progress while reaffirming long-term considerations. This way NGOs can match their agenda with the wider urban development agenda. For example, NGOs may support the community in the execution of community led housing through local assets or knowledge-based schemes. Simultaneously, they can respond to the cultural and economic demands of the population, thus establishing solutions in terms of housing that are sustainable and suited to the context.

To tackle these challenges, the study emphasizes the importance of government policymakers, urban planners, and architects collaborating to develop targeted interventions. Policymakers should focus on creating comprehensive land and housing policies to address inequality and improve access to housing units. Some measures that need to be implemented include the regulation of land use to prevent instances of land speculation, unfair distribution, and land hoarding by influential individuals. Additionally, improving the legal framework for land registration and ownership will enhance tenure security for the poor while ensuring transparency in land transactions.

This research shows that there are examples of innovative solutions to the housing crisis in the case studies studied here. This study reviewed affordable housing projects for different countries and suggests adapting their strategies to the context of Mogadishu. These methods include modular and prefabricated construction techniques that significantly reduce the time and cost of construction. Another approach that the study suggests is an incremental design, and it has already proven successful, which enables residents to progressively increase the size of their homes depending on their income and changing

needs over time. It mirrors the actualized realities of low-income families, like the desire for common spaces, and meets their flexibility requirement, with dwellings possessing such attributes as the allowance for communal living areas. This is especially applicable to Somali culture, fostering the inclusiveness of extended families. These examples show that the way forward is to combine technological advancements with participatory design for sustainable and inclusive housing solutions.

Another key strategy in tackling the Mogadishu housing crisis is community-oriented layouts, like courtyards, playgrounds, and community gardens. These spaces are to enable engagement and address community-related intimacy. Accessing the schools, health facilities, and even the markets should be integrated into the residential layout since the social infrastructure improves the living standard, and it will help bridge the gap between the classes and the communities and lessen the pressure of traveling and also raise the living standards of residents.

Similarly, sustainability should play a role in Mogadishu's built environment, emphasizing strategies that save money and avoid harm to the environment while providing for housing needs. Reductions may also be achieved by integrating aspects like renewable energy (including solar panels) and using local materials (stones, clay) in their construction. And they will not only meet current housing needs but will be well suited for future neighborhood growth, integrating water harvesting systems and climate-resilient construction practices. They will lower utility costs for residents, stimulate the local economy through resource procurement, and mitigate climate change impacts, fostering the city's sustainable development.

Infrastructure development contributes significantly to the affordability and accessibility of housing. They present the potential for low-cost housing development areas, which must be unlocked through improved roads, public transport, and utilities in the periphery. For example, investments in road networks and public transport systems would cut travel time and costs for those who live in peripheral neighborhoods, increasing their access to jobs and essential services in the city's downtown. In this regard, coordination between government agencies, private investors, and international donors is crucial to ensure infrastructure development goes together with housing and urban planning goals.

Another finding in this study highlights the need for stronger financial mechanisms for affordable housing initiatives. Such solutions are low-interest loans, microfinance programs, and subsidies that enhance affordability. Innovative funding models can put ideas in group ownership and diffusion of responsibility, as they will be related to social justice and social participation. Besides improving affordability, this type of urbanization helps address low-income groups through a more participative and inclusive type of housing. These steps are essential to designing a more equal and resilient urban environment.

In conclusion, the study reveals that Mogadishu's affordable housing crisis is primarily driven by rapid urbanization, widening economic disparities, and a lack of effective, locally tailored planning policies. The research shows that the current housing demand far exceeds the supply of quality, low-cost dwellings, leading to the growth of informal settlements and unsustainable living conditions. Ultimately, the findings emphasize that high construction costs and land prices coupled with outdated regulatory frameworks severely impede the development of affordable housing, highlighting an urgent need for innovative and context-sensitive solutions.

Furthermore, by drawing on successful case studies such as Quinta Monroy in Chile, LILAC in the UK, and Casa Real in Mozambique, the study demonstrates that incremental construction techniques, modular designs, and community-driven approaches can significantly mitigate these challenges. The evidence suggests that flexible, scalable housing models not only reduce costs through methods like prefabrication and phased development but also enhance long-term sustainability by incorporating local materials and culturally resonant design elements. In conclusion, the integration of public private partnerships and supportive government policies emerges as a critical factor in successfully implementing these strategies.

Consequently, the study recommends a multifaceted framework to address Mogadishu's housing problems. Key suggestions include adopting incremental construction and modular design methods to lower production costs and accelerate housing delivery, as well as embedding cultural relevance in design to meet the specific needs of local communities. Additionally, reforming urban planning policies to streamline land use and funding processes, alongside fostering robust public-private collaborations, will be essential in

creating an environment that supports sustainable and equitable urban growth. These comprehensive strategies offer a promising pathway toward resolving the affordable housing crisis in Mogadishu while enhancing the overall quality of urban life.

This study shows that the affordable housing crisis in Mogadishu is a serious concern that needs to be tackled as soon as possible through the lenses of human rights, social justice, and urban sustainability. The suggested approaches provide a framework for promoting fair and inclusive housing development and make clear the necessity to engage all pertinent stakeholders' government institutions, NGOs, private property developers, and residents throughout the housing development process. With continued collaboration, co-creation, and equity, Mogadishu can step up to address its housing crisis. Not only could this approach help address local challenges, but it also positions Mogadishu as a trailblazer for other fast-growing cities struggling with comparable housing issues.

In the end, finding affordable housing must be seen not just as a technical or economic problem, but as a moral one that society needs to work towards solving it together. This study's results can be the basis for significant change in the housing sector of Mogadishu by delivering practical solutions and information that are closely related to the socio-economic and cultural context of the city. By building on what we can learn from history, and what approaches can tell us about modern technologies and participatory processes. Mogadishu has a chance to transform its urban future and elevate the well-being of its most vulnerable populations. This study calls upon all parties to make housing affordable a priority, recognizing it as the backbone of any sustainable development effort and a key to enhancing the standard of living.

The research was also recognized to have limitations even as it provided possible solutions to housing challenges in Mogadishu. Limitations may also arise from the potential lack of generalizability of the Mogadishu focused context report findings to other settings and the absence of longitudinal data on the long-term impact of proposed interventions. And the limited data available has narrowed the study.

Future research needs to fill these gaps through comparative studies and assessments of the long-term impacts of implemented housing projects. Additionally, the integration of

climate-resilient housing design with renewable energy systems would enhance the overall understanding of sustainable housing solutions, which is still limited.



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