Nakuru county housing status report

Table of Contents

August 2025

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Foreword

Housing is a fundamental pillar of social and economic development in Nakuru County. As Nakuru County continues to experience rapid urbanization and population growth, the demand for adequate, affordable, and sustainable housing solutions has become urgent. The Nakuru County government has a role in the provision of accessible, adequate, and sustainable housing. This calls for evidence-based planning and decision-making to address the growing housing demand across the country. Nakuru County embarked on a study to assess the current state of housing, identify gaps, and align our strategies with the national agenda for housing.

The Baseline Research report will inform evidence-based policies and strategies for addressing housing challenges in the county. It represents a significant step forward to addressing the housing needs of the Nakuru County and thus contributing to sustainable urban development and economic transformation in the County. This report serves as a platform to drive informed interventions for affordable housing in the County. This baseline report provides a comprehensive analysis of the current state of housing in Nakuru, offering critical insights into housing conditions, building technologies, and access to basic infrastructure and services. Further, the report aligns with the Nakuru County's development priorities outlined in the County Integrated Development Plan (CIDP) 2023-2027 and the Annual Development Plans (ADPs) 2025-2026.

As we move forward, this report serves as a guiding document for the development of the Nakuru County housing investment plan and programs. It underscores the County Government's commitment to promoting affordable housing, enhancing urban planning, and fostering sustainable development. The report provides a framework for leveraging partnerships with the national government, private sector players, and other stakeholders to deliver on our housing agenda.

By working together, we can leverage the insights provided in this baseline report to create a more sustainable, equitable, and inclusive housing for all residents of Nakuru County. Finally, this will improve the quality of life and build an inclusive, equitable and sustainable housing market in the County.

Her Excellency Hon. Susan Kihika, EGH

Governor, Nakuru County

Statement by FSD Kenya

FSD Kenya operates as a market facilitator in the financial sector, focusing on inclusive financial markets, financial health and systemic change. In 2020, FSD Kenya launched its affordable housing finance project. The project aims to address systemic barriers in both rural and urban housing, promoting a more enabling environment and supporting demand and supply side innovations.

FSD deeply believes in data driven interventions and has supported FinAccess since 2005. The 2024 FinAccess Household Survey Report is the 7th edition based on the Financial Inclusion Survey. The report provides key developments in access, usage, quality and impact dimension of financial inclusion and is publicly available.

Housing contributes significantly to GDP both through the process of investment in creating housing and the services consumed once housing is built (either as rent or imputed rent for owner occupiers). Both are hard to measure in countries like Kenya due to the vast amount of housing delivered informally. The potential for housing to contribute to post-Covid economic growth was measured in an important study by Habitat for Humanity in 2020, entitled 'Cornerstone of Recovery.' The paper estimated that housing contributed **19.4%** to Kenya's GDP in 2020 (accounting for both housing investment and consumption and adjusting for the undermeasurement of the informal sector).

In addition, housing is recognised to contribute to at least **14 Sustainable Development Goals**. FSD strongly believes well positioned housing interventions can promote micro and small enterprises, provide households with resilience to overcome climate risks, promote womens economic empowerment and integrate useful digital solutions.

FSD Kenya's involvement in this baseline survey with KIPPRA for Nakuru County affirms our position to rely on data driven policy interventions. Quality data is critical for effective policy formulation and driving collaborations between the government, private sector, and civil society. It is hoped that this baseline study will inform Nakuru County's development of an inclusive housing policy, and the learnings can be shared with other counties who as they progress on their housing journeys.

Tamara Cook

Tamara Cook

Chief Executive Officer
FSD Kenya

Acknowledgements

Executive summary

This study aimed at analysing the housing sector in Nakuru County, assessing the trends, status, demand, supply and other characteristics. As underscored in the county's first Nakuru's CIDP, rural-urban migration and poor sanitation and infrastructure services that include housing require urgent policy attention. The County seeks to improve the housing sector to facilitate the supply of affordable and quality housing to its residents. Thus, this baseline study assesses the characters of the sectors with the aim of making policy contributions towards increasing the county's affordable housing. This study employs a mixed-methods approach, combining both primary and secondary data to comprehensively assess the housing status in Nakuru County. Primary data was collected Household surveys, key informant interviews, and focus group discussions. A stratified random sampling technique was employed to select households across 23 urban centers within Nakuru County. A total of 832 households responded to the survey across the 11 sub-counties. This was guided by Akiba Mashinani Trust (AMT) satellite imagery across the urban and peri-urban regions of the County. The findings are expected to promote evidence-based formulation of County housing policy and housing investment strategy.

On review of policy and legal framework, the Nakuru housing sector operates within a framework of national and county-specific legal and policy guidelines. For instance, the Constitution 2010 of Kenya underscores the right to life, dignity, and an adequate standard of living, which encompasses the right to proper housing. The Constitution affirms property ownership, including land, and advocates for social justice by ensuring access to affordable housing for all, including people with disabilities (PWDs). Kenya's Vision 2030, a long-term development plan, is aimed at transforming the country into a middle-income nation by 2030. A critical component of this Vision is the Affordable Housing Program (AHP), which aims to construct affordable. Vision 2030's affordability goals include providing housing for low- and middle-income groups through encouraging private sector participation and creating a Housing Fund for project financing. Despite having a policy and legal framework in place, housing affordability remains a challenge in Nakuru County. Low-income households struggle with financing, and private sector engagement in affordable housing is limited due to lower profit margins particularly with high prevailing interest rates on government bonds, which set the benchmark for risk reward rates. Infrastructure deficits and high taxes on construction materials increase development costs, and land tenure disputes hinder progress. Coordination among stakeholders is often inadequate and developers and households face challenges obtaining the various approvals required for delivering housing, which adds to the cost and time of delivering affordable housing. Notably, 63.6 per cent of homeowners did not seek government approvals when building, according to the KIPPRA Survey 2024.

Analysis of the housing status and patterns in Nakuru County indicates that the average household size is 4.5 persons, slightly above the national average, with many households consisting of 3-4 members. A youthful population primarily aged 15-64 years exists, and over 81 per cent of urban households earn less than KES 20,000 monthly, highlighting a demand for affordable housing. The KIPPRA 2024 survey notes that while most households live in durable structures (mainly made of iron sheets and cement), some still reside in low-quality housing. The market is dominated by rental flats and apartments, with low homeownership due to high costs and points to a need for enhancing the supply of social rental housing. Overcrowding is an issue, with many households in one or two-room units, prompting recommendations to enhance affordable housing initiatives. Infrastructure access varies across sub-counties, with Nakuru Town East and West showing better access to clean energy and sanitation, while areas like Bahati, Rongai, and Subukia face significant deprivation. The Multidimensional Housing Deprivation Index (MHDI) is 0.38, indicating that nearly 40 per cent of households are multidimensionally deprived, particularly in Subukia,

Gilgil, and Bahati. Key improvement areas include sanitation, clean cooking energy and digital connectivity. To enhance living conditions and promote equitable development, targeted infrastructure investments and public-private partnerships are essential, particularly in underserved peri-urban and rural areas.

Analysis of housing construction costs across Nakuru County indicates cost dynamics are vital for assessing housing affordability in Nakuru County, with prices and land costs influenced by location, availability of social amenities (such as schools and hospitals), and basic infrastructure (sanitation, electricity, and water). Key factors affecting construction material costs include availability, distance from suppliers, quality, brand reputation, and regulatory expenses. A study by AFD and the State Department for Housing and Urban Development showed that the average cost to build a two-bedroom house (with wet core) is KShs. 20,000 per square metre, KShs. 20,000 including cost of land. Labour costs start at KShs. 600 per day for unskilled workers and KShs. 3,000 for skilled workers, excluding professional fees. This points to the need to revise the offtake price payable to developers under the AHP which was previously benchmarked at KShs. 50,000 per square meter, which was meant to compensate not only for the hard construction cost, but also the cost of land, professional fees, regulatory fees, infrastructure, marketing and finance.

House prices vary based on proximity to amenities, accessibility, area, finishes and additional features, with higher prices in wealthier areas. Developers typically transfer infrastructure costs to homebuyers. In the AHP, a one-bedroom house in Bondeni averages KShs. 1,550,000, while a two-bedroom unit costs KShs. 3,250,000, with prices increasing in areas like Milimani. In Nakuru County, the AHP is structured as a public-private partnership, where the government provides land, and private developers manage construction, distributing units 20 per cent to the government and 80 per cent to developers. Despite the rapid growth and development, Nakuru County faces significant constraints in the housing sector that include inadequate suitable land for housing development, high cost of infrastructure development is passed onto the prices of housing, financial constraints to build or rent, and complex regulations governing housing development. Key policy interventions include providing public land for the development of affordable housing units, embracing public-private partnerships, investing in infrastructure, increasing the coordination and ease of obtaining approvals and promoting standardized building plans and typologies, and providing tax incentives to increase affordability and offtake. Alternative Building Materials and Technologies (ABMT) have been purported to bring down the cost and time of construction however they cannot offer a panacea without other value chain enhancements A Kenya Green Building Society study showed the importance of technologies like soil stabilized blocks for rural housing from an environmental perspective, but limited savings in cost compared to stone. For high density urban housing, technologies like, compared to stone etc. Other technologies like expanded polystyrene panels (EPS), aluminium formwork poured concrete, 3D printing which are more suitable to high density housing in urban areas offer speed efficiencies but often require higher upfront investment and need economies of scale to justify their use. And speed efficiencies are only helpful if the demand for offtake is ready to purchase the units, but affordability remains a key challenge.

On assessing the housing value chain, the housing value chain in Nakuru County starts with land acquisition and progresses through construction and infrastructure development to meet housing demands. Key players include developers and contractors, both public and private sectors, and households who design, finance, and build homes, creating economic value in the process. The affordable housing program is vital for stimulating the local economy, contributing to various economic sectors. Financing and data analysis are essential for identifying challenges and solutions in the sector. Despite significant policy efforts, the housing sector faces challenges such as limited access to affordable land, high development costs, long approval processes, and a

skills gap in construction. Issues like low-quality materials result in substandard housing. Furthermore, high raw material and labour costs affect affordability, which results in developers focusing on higher-income groups, leaving lower-income populations underserved, as a smartly designed subsidy program is required to serve the latter. Logistics and fluctuating material costs also disrupt the housing value chain. The study makes key recommendations that include promoting one stop shop and standardized plans, providing tax incentives on building raw materials and developer profits, enhancing investment in infrastructure, revising Acts relating to professionals (architects and surveyors Act), providing appropriate finance for construction, and establishing a sinking fund for priority maintenance which shall be adequate in the county.

1. Introduction

1.1 Overview of Nakuru County

Nakuru County is one of 47 counties in the Republic of Kenya, situated in the Southeastern part of Rift Valley. It neighbours 7 counties with Baringo to the north, Laikipia to the Northeast, Nyandarua to the East, Kajiado to the south, Narok to the Southwest with Bomet and Kericho to the West. The location of the County is presented in Figure 1.1.

Figure 1.1: Location of Nakuru County in Kenya and Its Sub-Counties
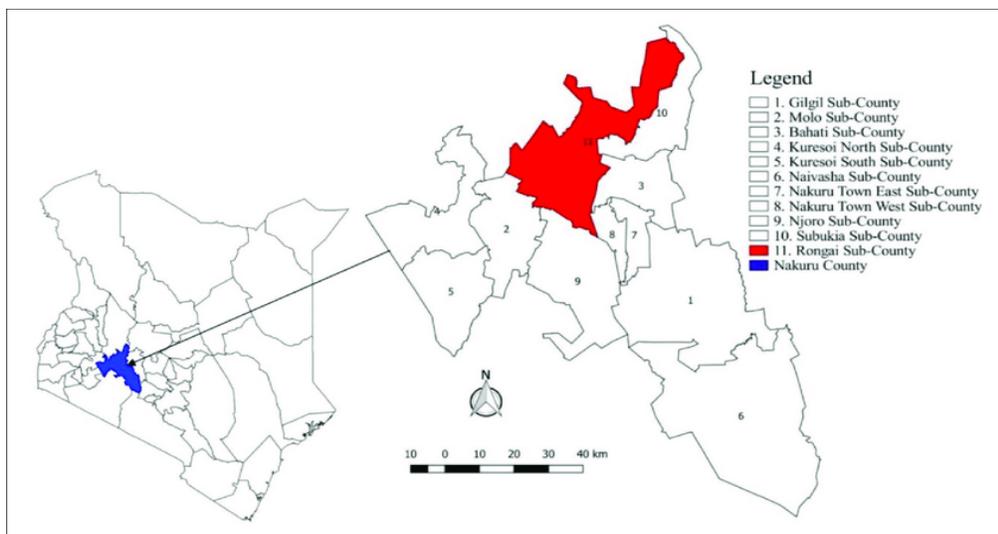
Source: Nakuru County Integrated Development Plan, 2018-2022

Nakuru City serves as the County's capital. With land area covering an area of 7,505 Km², and a conducive ecological system, there are immense economic opportunities in agriculture, tourism, trade, industry and energy generation. Some of its topographic features include the Menengai crater, Mt. Longonot crater, Hell's Gate, Mau Escarpment, Lake Nakuru, Lake Naivasha and Lake Elementaita. The bimodal rainfall pattern in the region has a high of 1800mm and a low of 500mm. According to the 2019 Kenya National Population and Housing Census, the County has a total population of 2,162,202, representing 4.5 per cent of Kenya's total population. The gender distribution is 49.8 per cent male and 51.2 percent female. The county has 616,046 households, with an average household size of 3 to 4 persons. The majority of the households (55.2%) are located in urban locations, compared to 48.4 per cent of the population in rural locations.

Administratively, Nakuru County has 11 sub counties (Rongai, Bahati, Gilgil, Kuresoi North, Kuresoi South, Molo, Naivasha, Nakuru Town East, Nakuru Town West, Njoro and Subukia)

and 54 wards (Table 1.1). Relatively higher population densities are within Nakuru Town West, Nakuru Town East, Bahati, Njoro and Molo sub counties.

Table 1.1: Nakuru County is divided into eleven sub counties

Sub-counties	Wards	Population	Number of households	Land area (sq km)	Population density (persons per sq km)
Subukia	Subukia, Waseges, Kabazi	85,164	21,819	402	212
Kuresoi south	Amalo Keringet, Kiptagich, Tinet	155,324	34,627	591	263
Molo	Mariashoni, Elburgon, Turi, Molo	156,732	41,462	483	324
Kuresoi North	Kiptoro, Nyota, Sirikwa, Kamara	175,074	40,359	618	283
Gilgil	Gilgil, Elementaita, Mbaruk/Eburu, Malewa West, Murindati	185,209	58,920	1075	172
Nakuru Town East	Biashara, Kivumbini, Flamingo, Menengai, Nakuru East	193,926	61,398	231	840
Nakuru Town West	Barut, London, Kaptembo, Kapkures, Rhoda, Shaabab	198,661	64,481	72	2,764
Rongai	Menengai West, soin, visoi, Mosop, Solai	199,906	52,348	988	202
Bahati	Dundori, Kabatini, Kiamaina, Linet/Umoja, Bahati	218,050	61,728	387	563
Njoro	Mau Narok, Mauche, Kihingo, Nessuit, Lare, Njoro	238,773	61,271	699	341
Naivasha	Biashara, Hellsgate, Lakeview, Maiella, Mai Mahiu, Olkaria, Naivasha East, Viwandani	355,383	117,633	1,958	181

Source: 2019 Kenya Population and Housing Census

1.2 Economic activities of Nakuru County

The main drivers of Nakuru County economy are electricity supply; agriculture, forestry and fishing; transport and storage; financial and insurance activities; and real estate Activities. The County is a key contributor to the national economic growth and development. Overall, the county's share of Gross County Product (GCP) between 2013 and 2022 is on average 5.5 per cent. The County's construction and real estate activities show an increasing trend in recent years indicating a growth of the housing sector. To drive growth in the economy, the county government aims to complete key

infrastructure projects including housing, improve agricultural productivity, expand vocational training programs, and continue diversifying economic sectors to create jobs for the fast-growing population. The County also has a modern transport network and wholesale/retail trade serving local and regional markets. Meanwhile, tourists are attracted to globally famed attractions including Lake Nakuru National Park, Menengai Crater, and Hyrax Hill historical site which contribute revenues.

Table 1.2: Nakuru County GCP and Contribution of Construction and Real Estate Activities to GCP

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
County Contribution to Gross Value Added	5.4	5.7	6.0	6.6	6.9	4.8	4.9	4.9	5.2	4.9
Construction contribution to GCP (KShs billions)					16.7	20.4	23.0	28.1	31.8	35.7
Real Estate Activities Contribution to GCP (KShs billions)					26.2	24.9	26.6	28.1	30.2	32.4

Source: KNBS County GCP reports (various)

1.3 Affordable housing programme and social housing

Globally, housing goes beyond the provision of physical shelter. It implies a stable, safe, and affordable living environment that meets the basic needs of individuals and families. Housing is critical for the social and economic stability of a country, hence serving as a foundation for access to essential services, employment, and social inclusion. It plays a significant role in county development with issues like rapid urbanization and population growth driving an urgent demand for more affordable and sustainable housing options. Affordable Housing Program (AHP) is a government initiative aimed at providing decent, safe, and affordable housing

to low and middle-income Kenyans. The program leverages public-private partnerships to develop housing units in various locations across the country.

Box 1.1: Building and acquiring Affordable Housing

The APH starts by a developer or government identifying a suitable land for housing development. After suitable land is identified, the developers begin to construct housing units adhering to the specific standards and specifications that the government or investors provide.

The government has the platform of Boma Yangu where Kenyans can buy housing units from. Kenyans are supposed to create an account on the Boma Yangu Portal of use the *832# USSD code. One is then required to provide personal information including the ID number and preferred housing location. The government will assess one's eligibility using various factors such as income. From the available options, one is supposed to choose a suitable house and make a downpayment of 10% then monthly mortgage payments. One can make a minimum deposit of Kes 200 to their Boma Yangu account anytime till they accumulate the amount they need to purchase a housing unit.

Social housing on the other hand is a type of housing provided by the government or a non-profit organization at below-market rates to low-income individuals and families. It aims to address housing affordability and homelessness. Social housing has been an evolving concept in Kenya, primarily aimed at addressing housing shortages for low-income households and vulnerable groups. Initially, social housing projects were primarily government-led, but over time, a mix of donor-funded and community-driven initiatives have emerged to support this sector.

The AHP and social housing are interconnected in their shared goal of providing affordable housing. While the AHP focuses on a broader range of income groups, social housing specifically targets the lowest-income segment. By incorporating elements of social housing, such as subsidized rents and targeted allocation, the AHP ensures that a significant portion of the housing units are accessible to the most vulnerable populations.

1.4 The need for affordable housing Supply in Nakuru County

Kenya has experienced a rapid population growth that increased from 8.0 million to 47.6 million people between 1969 and 2019 (Figure 1.2). The high population growth has contributed to the growth of urban population, in search of livelihood opportunities.

Tamara Cook

Figure 1.2: Kenya urbanization trend, 1969-2019
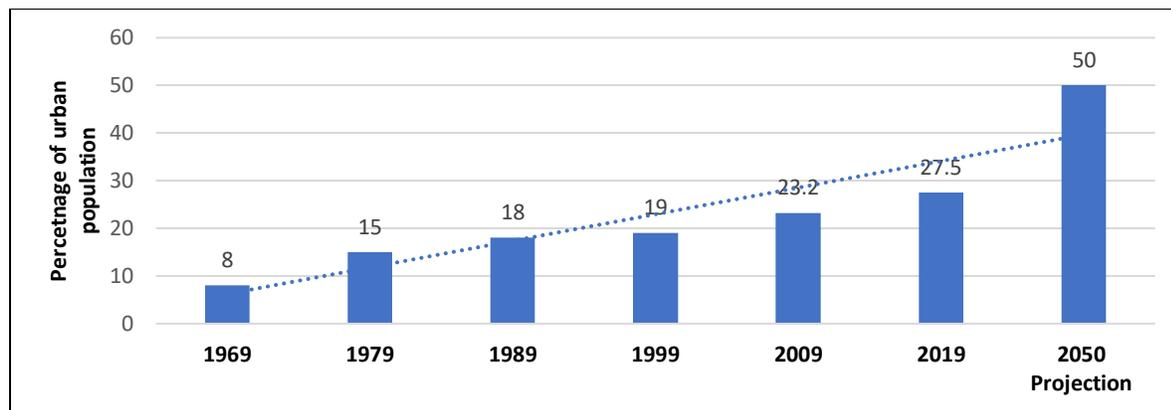
Source: Kenya National Bureau of Statistics Census reports (various)

Owing to the rapid population growth, the urbanization rate has also increased substantially (Figure 1.3). Nationally, the share of urban population increased from 23.2 per cent in 2009 to 27.5 per cent in 2019. Nakuru County's urbanization rate has been much higher than the national average; with 55.2 per cent of the households and 48.4 per cent of the population in urban locations.

Figure 1.3: Kenya Urbanisation from 2009-2019
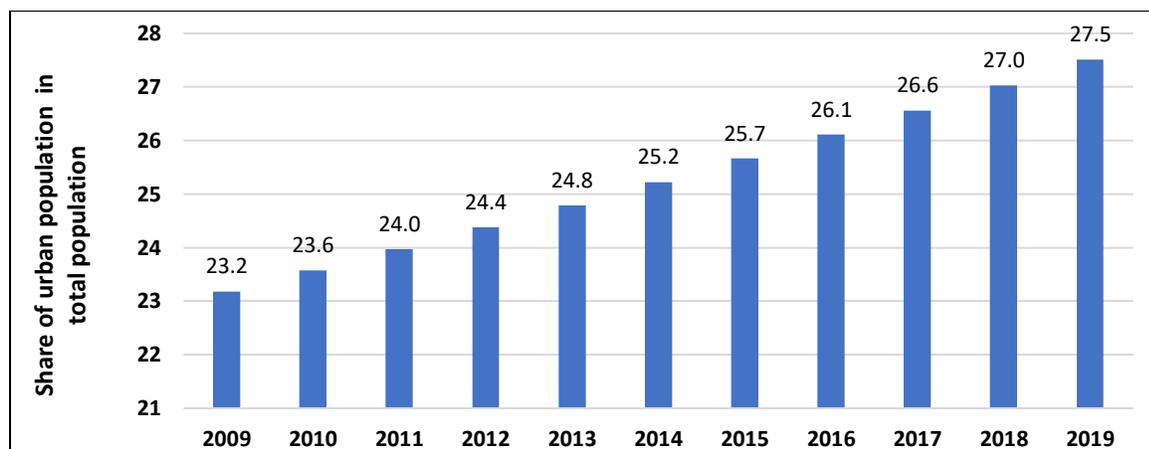
Source: Statistical abstract, 2020

Nakuru County is ranked fourth in the distribution of population of Kenya's urban residents with an estimated population of 1,047,080 (Figure 1.4). Disparities are seen across the counties in the composition of the urban population with Elgeyo Marakwet, Bomet and

West Pokot registering low urbanization. The increasing urban population growth in Kenya is attributable to rural to urban migration. Kenya's urbanization rates are expected to remain high, with at least 50.0 per cent of the population living in urban areas by 2050 and continue to pose a challenge in access to basic sanitation and infrastructure services, which will stagnate socio-economic progress and the well-being of the population.

Figure 1.4: Distribution of urban population across counties in Kenya
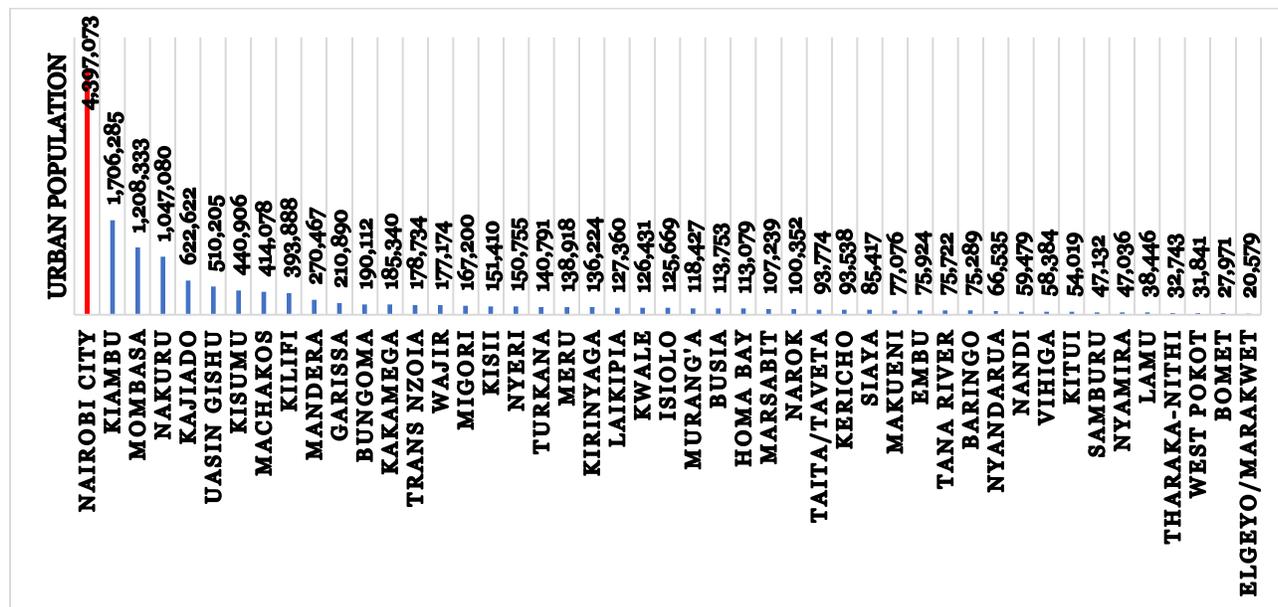
Source: Kenya Population and Housing Census (KPHC) 2019

Nakuru County's size and population continue to grow, with projections showing that the population may rise to 2.4 million by 2030 (2015 National Adolescents and Youth Survey). With these expansions and urbanisation comes associated challenges like increased competition in access to social amenities and infrastructure and growing informal settlements. The County's first County Integrated Development Plan, CIDP (2013-2017) highlighted the major social economic development challenges faced by the county that included: High level of insecurity, high poverty levels, poor infrastructure, educational needs, high rates of accidents, rural-urban migration, and inaccessibility of health services and inadequate energy supply.

Due to rapid urbanisation, the County faces challenges in the provision of housing, and it has initiated several projects to address this issue. So far, some of the key initiatives by the County Government of Nakuru include provision of social housing units – Over 5,000 units comprising single rooms, bed sitters, one bedroom and two bedrooms. Further, the County is empowering local communities to access affordable housing through Alternative Building Technologies (ABTs), with such demonstration centres established in

every sub-county. There are also initiatives to supply affordable housing through Public-Private Partnerships (PPPs). Together with the national government, there are also initiatives to improve the wider infrastructure network. The County has a total of 9,654.10 km of roads, classified into different categories. The County Government has also prioritized the development and improvement of water infrastructure throughout the county to increase accessibility. The expansion of infrastructure remains a top priority in the County, as it has implications for rural-urban migration and settlement patterns.

Despite various policy initiatives and interventions so far in the County, rapid population particularly within the urban areas has outstripped housing development and therefore access to affordable housing poses a great challenge to the County's socio-economic progress.

1.5 Objectives of the study

The County's development blueprints, including the first and the current CIDP underscore the policy attention towards addressing housing gaps including poor sanitation and inadequate infrastructure services. The County seeks to improve the housing sector by facilitating the supply of affordable and quality housing to its residents. Thus, this baseline study assesses the housing sector in Nakuru County with the aim of making policy contributions towards increasing the county's affordable housing. The findings will promote evidence-based formulation of County housing policy and housing investment strategy.

The specific objectives of the baseline study are to:

  i.   Assess the housing status and patterns in Nakuru County
  ii.   Analyse housing construction costs across Nakuru County
  iii. Assess housing value chain-based investment opportunities and constraints in Nakuru County

2 Policy and legal framework for housing

This section reviews various policies and legal initiatives towards housing agenda at the global, regional and national levels. The section further outlines the status of policy and legal initiatives including policy issues requiring attention.

2.1 Global and regional policy and legal frameworks

There are various policies and legal frameworks at the global and regional levels that guide the development of housing. For instance, the UN SDG goal number 11 on sustainable cities and communities focuses on ensuring everyone has access to adequate, safe and affordable housing and basic services. UN-Habitat cites "The right to an adequate standard of living, including food, clothing and housing" as a fundamental human right as enshrined in the International Human Rights Law. Adequate housing implies security of tenure, affordability, habitability, availability of services, accessibility, location, and cultural adequacy. The International Covenant on Economic, Social and Cultural Rights is a states' treaty that recognizes the right of everyone to an adequate standard of living including housing.

The Habitat III policy framework popularly known as the New Urban Agenda was adopted in 2016. It outlines a vision for sustainable urbanization to ensure cities globally are safe, inclusive, sustainable and resilient as a means of addressing global challenges such as poverty, climate change, and inequality. UN-Habitat advocates for compact and mixed-use housing development by addressing urban planning that integrates residential, commercial, and industrial zones to reduce sprawl and enhance walkability. It is supporting governments to improve both infrastructure and informal settlement by investing in urban transport and provision of basic services. The Global Housing Strategy of 2017 (UN-Habitat Global Housing Strategy) places housing at the centre of National and Local Urban Agendas and aims at making housing affordable for all by 2030. UN-Habitat promotes housing designs that cater to the needs of older adults, including accessible features, social spaces, and proximity to essential services. It advocates for the adoption of smart transportation, smart grids, and e-governance by leveraging advanced technologies.

The Word Bank through the Global Housing Finance and Inclusive Housing Finance Program seeks to accelerate housing development by funding member countries to offer affordable housing. This is through developing resilient housing finance markets and designing and implementing long-term funding solutions and advising on legal and regulatory frameworks and policy reforms. The World Bank policy on housing provides for avenues to offer loans and grants to facilitate development of affordable houses and improvement of slums. The Kenya Slum

Upgrading Programme (KENSUP) by UN-Habitat has developed interventions and initiatives to improve the lives and livelihoods of people living and working in slums.

Modern and livable habitats and basic quality services are also priority areas in the Africa Union's development agenda- Agenda 2063, from a regional perspective. The AU's Agenda 2063 outlines Africa's long-term development goals that emphasize the importance of housing as part of the broader socio-economic transformation. In line with this agenda, several AU member states have introduced legislation aimed at addressing housing shortages, improving living conditions, and promoting sustainable urban development. While the AU has made strides in developing strategic policy direction on housing, the actual implementation at the national levels remains uneven. The countries that have made good progress include Ethiopia, through its Integrated Housing Development Program, has delivered mass affordable housing projects, especially in Addis Ababa. Rwanda has implemented policies for sustainable urbanization and affordable housing, with Kigali serving as a model city for urban planning. South Africa has also made significant strides in low-cost housing through its Reconstruction and Development Programme (RDP), though challenges remain in equitable access across its provinces.

Despite these initiatives, there are substantial constraints in housing sectors where the UN-Habitat estimates that 40 per cent of the world population will need adequate housing by the year 2030 due to the increasingly growing population, with over 60 - 70 per cent expected to live in urban areas. This translates to a demand for 96,000 housing units, affordable and accessible, every day. UN-Habitat also estimates 100 million worldwide to being homeless and one in every four people live in deplorable housing conditions. The World Bank Global Program for Resilient Housing estimates that 3 million people migrate to cities every week subjecting more people to dilapidated living environments. Evidently, many countries face resource constraints that hinder their ability to fully align their national building codes with regional standards.

2.2 National policy, legal and regulatory frameworks

In Kenya, much emphasis has also been put on access to affordable and decent housing, by the government and other key stakeholders. Article 43(1)(b) of the Constitution of Kenya 2010 stipulates that access to adequate housing and reasonable sanitation standards is a right for all citizens. Article 69 provides that the State shall ensure sustainable management and conservation of the environment. The constitution obliges the state to legislate and create measures that will ensure that the built environment is managed, maintained and conserved in a sustainable manner. The Kenya Vision 2030 also places the urban

sector at the top of the development agenda to provide universal infrastructure for inclusive and sustainable development. The Kenyan Vision 2030 proposes the establishment of infrastructure and housing bonds to enhance access to financing to attract investors, developers and buyers, into housing development.

Policies have been put in place by both the national and county governments to promote economic prosperity and housing development in counties. The enactment of the Constitution of Kenya led to the devolved system of governance and county governments were formed by (GoK, 2010). The county governments are mandated to planning and development. Counties prepare five-year County Integrated Development Plans (CIDPs) that showcase the plans the counties have for various sectors (County Government Act, 2012), implemented through Annual Development Plans (ADP). The County Government of Nakuru, through the third CIDP, has considered implementation of infrastructural development plans on key areas like housing. The National spatial plan 2015-2025 outlines suitable sites for public and private land developments, infrastructural investments, and areas that require strategic intervention. The Constitution of Kenya 2010 identifies access to adequate housing and to reasonable standards of sanitation as an economic and social right. In its broad sense, decent housing connotes housing that is inclusive of functioning infrastructure (clean and portable water, sanitation and waste management, energy), is safe for all residents including women and vulnerable populations, is in proximity to economic opportunities as well as markets, health centres, schools, recreational facilities and transport networks. As such, housing has significant inter-linkages across sectors that makes it a critical sector in the growth and development process.

Further, provision of affordable housing as one of the previous national government's pillars of growth under the "Big Four" agenda targeted to provide 500,000 decent houses alongside basic infrastructure to address the housing deficit (Kenya Affordable Housing Development Framework, 2018). More recently, the government, through its development initiative dubbed the Bottom-Up Economic Transformation Agenda (BETA) has put in place plans to harmonize affordable housing mortgages, enable low-cost mortgages of Sh10,000 and below and increase supply of new housing units to 250,000 per annum and percentage of affordable housing supply from 2 per cent to 50 per cent. The latter will be achieved by structuring affordable long-term housing finance schemes, including a National Housing Fund and Cooperative Social Housing Schemes, that will guarantee take of houses from developers.

In line with BETA, the National Government has provided a legal framework to operationalize the supply of affordable housing. Consequently, the Affordable Housing Act, 2024 was formulated to give effect to Article 43(1)(b) of the Constitution to provide a framework for development and access to affordable housing. This legislation provides a legal framework for housing levy at 1.5 per cent of the gross salary of an employee both in public and private sectors, and with an equivalent contribution by the employer since March 19, 2024. Based on the total workforce and average earnings, it is estimated that the monthly collection from this levy could run into approximately KShs. 6 Billion. The exact projected monthly collection, however, depends on the number of contributing employees and their earnings across sectors. Proceeds from the levy will be directed to the Affordable Housing Fund, which supports housing development, infrastructure, and maintenance projects.

Access to land, high development costs, long approval processes, financial constraints, inefficient building standards and safety, low public awareness and mismatch between design of houses and the needs of majority of the population are among the affordable housing challenges in Kenya. Kenya has an annual housing demand of 250,000 units with an estimated supply of 50,000 units, culminating in a housing deficit of 2 million units, or 80 per cent deficit. The establishment of the National Housing Corporation (NHC), county housing programmes, private sector involvement in both development and financing, enforcement of standards by the National Construction Authority (NCA) (established under the National Construction Authority Act, 2011) and the National Building Inspectorate, and public awareness campaigns are some efforts to tackle the challenges and promote access to affordable and decent housing.

To address policy challenges in housing, Kenya has had multiple policies that support the affordable housing project like the National Shelter Strategy to the Year 2000; Sessional Paper No. 3 of 2004 on National Housing Policy; and Sessional Paper No.3 of 2016 on National Housing Policy. The National Land Policy, 2009 provides guidelines for land use planning and management, which are critical components of sustainable urban development. For instance, the National Housing Policy No. 3 of 2016 encourages PPPs to accelerate housing development and leverage on private sector expertise for affordable housing and investments towards infrastructure development. This is also anchored in the Public Private Partnerships Act of 2021 that provides for private sector participation in financing, construction, development, operation, or maintenance of various projects. Kenya's Affordable Housing Programme launched in 2017 under the Big Four Agenda, planned on delivering 500,000 homes in a five-year period, which entailed offering incentives and support to deliver affordable housing.

The National Housing Corporation Strategic Plan 2023-2027 indicates that the government targets to construct 250,000 housing units annually to cover the deficit estimated to have accumulated to 2 million since the inception of Vision 2030. The 5-year plan commits KShs. 250 billion, with KShs. 50 billion from government budgetary allocations and KShs. 200 billion from pension funds. National Land Policy 2023 highlights some of the key themes being land use management and the investments towards management measures such as conservation and new technologies.

Other notable policy documents that seek to promote the quality of housing in Kenya include the National Building Maintenance Policy approved in 2015. This policy seeks to establish a sinking fund for priority maintenance which shall be 5 per cent of the value of the asset. Similarly, the National Housing Policy 2004 noted that lack of proper management and maintenance reduces quality of housing stock and adversely affects the built environment including infrastructural facilities and other services. The Policy proposes formulation of National guidelines and standards on real estate management and maintenance. Further, the Sessional Paper No. 3 of 2016 on National Housing Policy ensures progressive realization of the right to accessible and adequate housing and reasonable standards of sanitation for every person as per Article 43 of the Constitution. The policy also intends to arrest the deteriorating housing conditions countrywide and bridge the shortfall in housing stock arising from demand that far surpasses supply particularly for low-income housing in urban areas.

In terms of legal framework, there are various housing frameworks put in place. For instance, the Housing Act, 2012, provides the legal framework for loans and grants of public money for the construction of dwellings; to establish a housing fund and a housing board for these purposes; and for connected purposes. The enactment of the Urban Areas and Cities (Amendment) Act, 2019 gives effect to Article 184 of the Constitution, which provides for the classification, governance, and management of urban areas and cities. It also provides for the criteria of establishing urban areas, the principle of governance and participation of residents, and for connected purposes. Specifically, the law advocates an integrated planning framework within which all county governments must operate, among other functions, incorporate planning and delivery of affordable housing and basic infrastructure. Following the amendment of the Act in 2019, the population required for an area to be classified as a city reduced from 500,000 to 250,000 residents, which has been applied in designating Nakuru town in Nakuru as a city. Enactment of the Physical Planning and Land Use Act 2019: to govern the planning and management of urban and rural areas.

The continued implementation of the affordable housing project by the government has immense potential for positive impact that goes beyond access

to houses. Among the positively impacted areas are employment and the construction sector. Following the development of the National Spatial Plan 2015-2025, and County Spatial Planning Guidelines, 2018, Nakuru County has prepared the following: Nakuru County Spatial Plan; Nakuru Integrated Strategic Urban Development Plan; Naivasha Integrated Strategic Urban Development Plan; and respective Integrated Development Plans for Nakuru City, Naivasha Municipality, Molo Municipality and Gilgil Municipality.

The Nakuru County government can leverage these policies and legal frameworks and the national government initiatives to pull resources, bring private investors on board, and establish a working housing policy for the county. Insights can be drawn from other countries. For example, Singapore is advanced in terms of housing development hence its policies can act as a benchmark to Kenya. It has successively implemented various policies to be able to provide housing for over 80 per cent of the population, with 90 per cent of these owning the dwellings they live in. It has a mortgage system managed by the Housing and Development Board (HDB) and financed by Central Provident Fund (CPF). The contribution towards the CPF is in the form of pensions which is compulsory for both employers and employees, which was 5 per cent of the monthly salary (applying to both employer and employee) around 1955, and currently at 20 per cent for employees and 13 per cent for employers. This is consistent with Kenya's housing levy which is mandatory for all employees and employers.

Table 2.1 provides a summary of local policies and laws on housing. Based on various aspects that include access to land, incentive for building and buying housing, access to basic infrastructure.

Table 2.1: Summary of local policies and laws on housing

Policy element	Description of the policy element	Status of Policy and Legal Framework	Issues
Access to basic infrastructure	Access to basic infrastructure entail availability to use infrastructure such as road, ICT, water, sanitation and energy	• Constitution 2010 – highlights the right to life, dignity and adequate standard living for oneself and family translating to right to adequate housing. It recognizes the right to own property, including land, which has implications on housing development. In addressing social justice and equality, it promotes the right to access and affordable housing for people of all ages and PWDs. • Vision 2030 – highlights the need to access affordable and adequate housing and the proper planning for urban centres. Sustainable development entails leveraging technologies to improve quality of life, urban planning, encourage innovations, and economic growth. • Sessional Paper No. 3 of 2016 on National Housing Policy highlights access to affordable housing, sustainable urban development and the promotion of social equity and inclusion in housing development. • The National Building Regulations of 2015 aim at spurring adequate supply of affordable housing. it also provides for the special requirements within and around buildings for PWDs • The Physical and Land Use Planning Act (2019) governs the planning, use, and development of land in Kenya. The Act is crucial at the beginning of the housing value chain, focusing on land use planning and zoning. It ensures that land is allocated and used in a manner that supports	• Inadequate comprehensive policy and legal framework address the housing trends. The available regulatory framework is complex and sometimes contradictory hence hindering housing development. • The overgrowing population hence failure to match housing demand. • The influx of rural-urban migration hence the increasing informal settlements and slums. • Low uptake of technology to adopt smart city concepts such as smart grids, 3D houses, smart transport • Climate change and lack of policy addressing sustainable housing development such as green buildings.

		sustainable housing development. The Act outlines the requirements for the preparation of physical development plans, which are essential for guiding the orderly growth of urban areas and housing projects. • The Land Act (2012) provides the legal framework for land management and administration in Kenya. This Act is fundamental to the housing value chain as it governs land acquisition, registration, and ownership. The Act addresses issues related to land tenure, compulsory acquisition, and settlement, which are critical for housing development. The Act facilitates the availability of land for housing projects and ensures that land transactions are transparent and secure. • The Land Registration Act (2012) provides the procedures for land registration and the management of land registries. Efficient land registration is vital to the housing value chain, as it provides legal recognition of land ownership and transactions. This Act ensures that land titles are secure, reducing disputes and facilitating the smooth transfer of property, which is essential for both developers and homebuyers • The Special Economic Zones Act of 2015 encourages economic growth through supporting various industries and businesses, which include infrastructure development such as housing. • National Land Policy (Sessional Paper No. 3 of 2009) and the Recommended National Land Policy of 2023 highlights some of the key themes being land use management and the investments towards management measures such as conservation and new technologies	

		• Nakuru County Spatial Plan 2014-2024 has a land use plan that identifies areas suitable for different land uses, including residential, commercial, and industrial to ensure compatibility with other land uses. It also focuses on infrastructure development, environmental management and urban renewal. • Physical and Land Use Planning Act 13 of 2019 governs procedures and standards for implementation of physical and land use plans in national and county governments, urban, cities, and rural levels.	
Housing Costs	Housing costs refers to costs for land, construction, approvals and maintenance	• Kenya Vision 2030 is the country's long-term development blueprint aiming to transform Kenya into a middle-income country by 2030. Vision includes the Affordable Housing Program (AHP) as one of its key pillars under the social pillar, focusing on providing affordable and decent housing. The program targets the construction of 500,000 affordable housing units by 2022, though the timeline has since been extended. Key Elements of Affordability in Vision 2030 include: The provision of affordable housing for low- and middle-income groups; Promotion of private sector involvement in affordable housing development; and Establishment of a Housing Fund to finance affordable housing projects. • The current and previous governments identified affordable housing as a key priority. For instance, the Big Four Agenda (2017-2022) identified affordable housing as one of its four pillars. The agenda aimed to build 500,000 affordable homes by 2022. While the Bottom-Up Economic Transformation Agenda (BETA) development plan for 2022-2027 identified	Despite the comprehensive policy framework, housing affordability remains a challenge for low-income households in Nakuru County. • Limited ability of low-income households to secure financing. • Limited Private Sector Engagement • While public-private partnerships are encouraged, the involvement of the private sector in affordable housing is still limited due to perceived lower profit margins compared to high-end housing projects. • Inadequate infrastructure in some areas increases the cost of housing development, as developers may need to invest in infrastructure

		Affordable Housing Project as a cornerstone of economic development. This initiative aims to address the housing deficit and promote homeownership, particularly among low-income individuals. Additionally, it is expected to generate jobs in the construction sector and boost the overall economy. Among the initiatives to achieve affordable housing include: Partnerships with private developers to increase the supply of affordable housing; Introduction of measures to reduce the cost of building materials and construction; and Establishment of a mortgage refinancing company to provide low-interest loans for homebuyers. • The Kenya Mortgage Refinance Company (KMRC) is a public-private partnership initiative established to provide long-term financing to mortgage lenders, thereby enabling them to offer affordable mortgage products. The KMRC plays a crucial role in the Affordable Housing Programme by providing affordable mortgage finance to homebuyers, particularly those in the low and middle-income segments. • Environment and Land Court Act (ELCA) No. 19 of 2011 provides for protection of land rights and settling of land disputes which have implication to housing development. • The BETA development plan aims at addressing housing deficit and promoting ownership of houses especially to low-income individuals. • Sessional Paper No. 3 of 2016 on National Housing Policy encourages public-private partnerships to accelerate housing development and leverage private sector expertise; investments towards infrastructure	themselves, thereby passing on the costs to buyers or renters.

		development; provision of subsidies for housing to low-income households; invest in programs for slums' upgrading. • The National Housing Corporation (NHC) Strategic Plan 2023-2027 promotes the adoption of new building technologies by manufacturing Expanded Polystyrene (EPS) panels. It is also mandated by Executive Order No 1 of 2023 for NHC to conduct research on construction technologies in the affordable housing scheme. • The National Construction Authority Act 2011 provides for safety standards in construction hence ensuring houses are safe and habitable to residents. • Urban Areas and Cities Act of 2019, which is an amendment of the 2011 Act, provides for classification of areas as urban areas or cities and enhancing proper planning for urban development. • The Public-Private Partnerships Act of 2021 provides a legal framework for private sector participation in the financing, construction, development, operation, or maintenance of various projects, including housing projects • The Housing Act (Cap 117) establishes the National Housing Corporation (NHC) and provides a framework for housing development in Kenya. The Act is central to the construction phase of the housing value chain. It empowers the NHC to undertake housing development projects, particularly for low and middle-income groups. It also allows for the development of housing finance schemes, which are critical for funding construction activities and making housing affordable.	

| | | The Public Procurement and Asset Disposal Act (2015) regulates the procurement of goods, services, and works by public entities. The Act is relevant to the housing value chain, particularly in the procurement of construction services and materials. It ensures that procurement processes are transparent, competitive, and fair, which is essential for maintaining quality and controlling costs in housing projects. The Public Finance Management Act (2012) provides a framework for the management of public finances in Kenya. The Act impacts on the financing aspect of the housing value chain by regulating how public funds are allocated to housing projects. It also establishes mechanisms for the creation of special funds, such as the National Housing Development Fund, which is used to finance affordable housing projects. The Rent Restriction Act (Cap 296) regulates the control and determination of rents for residential premises. While primarily focused on rental housing, this Act impacts the housing value chain by influencing the rental market, which is an essential component of the housing sector. The Act seeks to protect tenants from exploitation and ensures that rent increases are justified, thereby contributing to housing affordability. The Nakuru County Integrated Development Plan (CIDP) 2023-2027 highlights one of the key priorities as being to enhance resilient and sustainable urban areas as well as facilitate access to affordable and decent housing. The Landlord and Tenant (Shops, Hotels, and Catering Establishments) Act (Cap 301) | |

		regulates the relationship between landlords and tenants in commercial properties but has implications for residential properties as well. While primarily focused on commercial properties, the principles of rent regulation and dispute resolution mechanisms provided in this Act have influenced broader discussions on rent control and affordability in residential housing. • The Nakuru County Integrated Development Plan (CIDP) 2023-2027 is the primary document guiding development in the county, including the housing sector. CIDP prioritizes the development of affordable housing units through partnerships with the national government and private developers. The CIDP provides strategies to offer initiatives targeted at low- and middle-income households, with specific focus on reducing the cost of housing. • The Nakuru County Finance Act plays a significant role in determining the cost of housing through its taxation policies, fees, and levies.	
Investment in housing	Investment in housing entails initiatives out in place to promote the growth of housing sector	• Vision 2030 – enhancing access to finance by developers and buyers and promoting reforms that unlock the full potential of the housing sector. Attract investors through infrastructure and housing bonds. • The National Housing Corporation Strategic Plan 2023-2027 is encouraging new technologies by suggesting provision of loans for investment in new technologies. • The Affordable Housing Act 2024 provides for a housing levy upon every employee at the rate of 1.5% of the salary to implement affordable housing projects.	• Lack of comprehensive policy and legal framework on investment opportunities for housing development. • Changes in zoning and land use regulations impacting the feasibility of housing development projects. • Changes in tax laws such as property and capital gains laws thus affect the

		• The Urban Areas and Cities Act of 2019 mandates the board of an area to borrow money or make investments, conduct joint ventures through joint budgeting with other entities for urban and city development. The Act also promotes financial accountability to respective county governments. • Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) Regulations. These regulations by NEMA mandate environmental impact assessments for large-scale development projects, including housing. Feasibility studies often form part of the EIA process, assessing the project's potential environmental, social, and economic impacts.	profitability of housing investments. • Increasingly stringent regulations for building approvals and environmental regulations are adding to the cost and complexity of housing projects thus demotivating developers. • Corruption and misappropriation of public funds that would otherwise be invested in affordable housing programs. • Bureaucracy in land management processes. • Limited and unaffordable financing, due to high interest rates, which limit developers and homebuyers from developing or buying affordable houses
Housing maintenance	House maintenance refers to activities carried out to improve housing condition	• The Environmental Management and Coordination Act (1999) provides a legal framework for environmental management in Kenya. The Act is relevant to the housing value chain, particularly in ensuring that housing developments comply with environmental regulations. It requires developers to conduct Environmental Impact Assessments (EIAs) and obtain necessary approvals, which is essential for sustainable housing development. • Building code 2024 is set out to regulate design, construction and maintenance of buildings in Kenya to ensure they are safe, energy efficient,	• Huge backlog of maintenance works that are expensive and difficult to address and decayed built environment that negatively impacts on quality of life and may contribute to low productivity and social ills • Presence of overlapping and multiple legislation on maintenance that requires effective coordination mechanisms

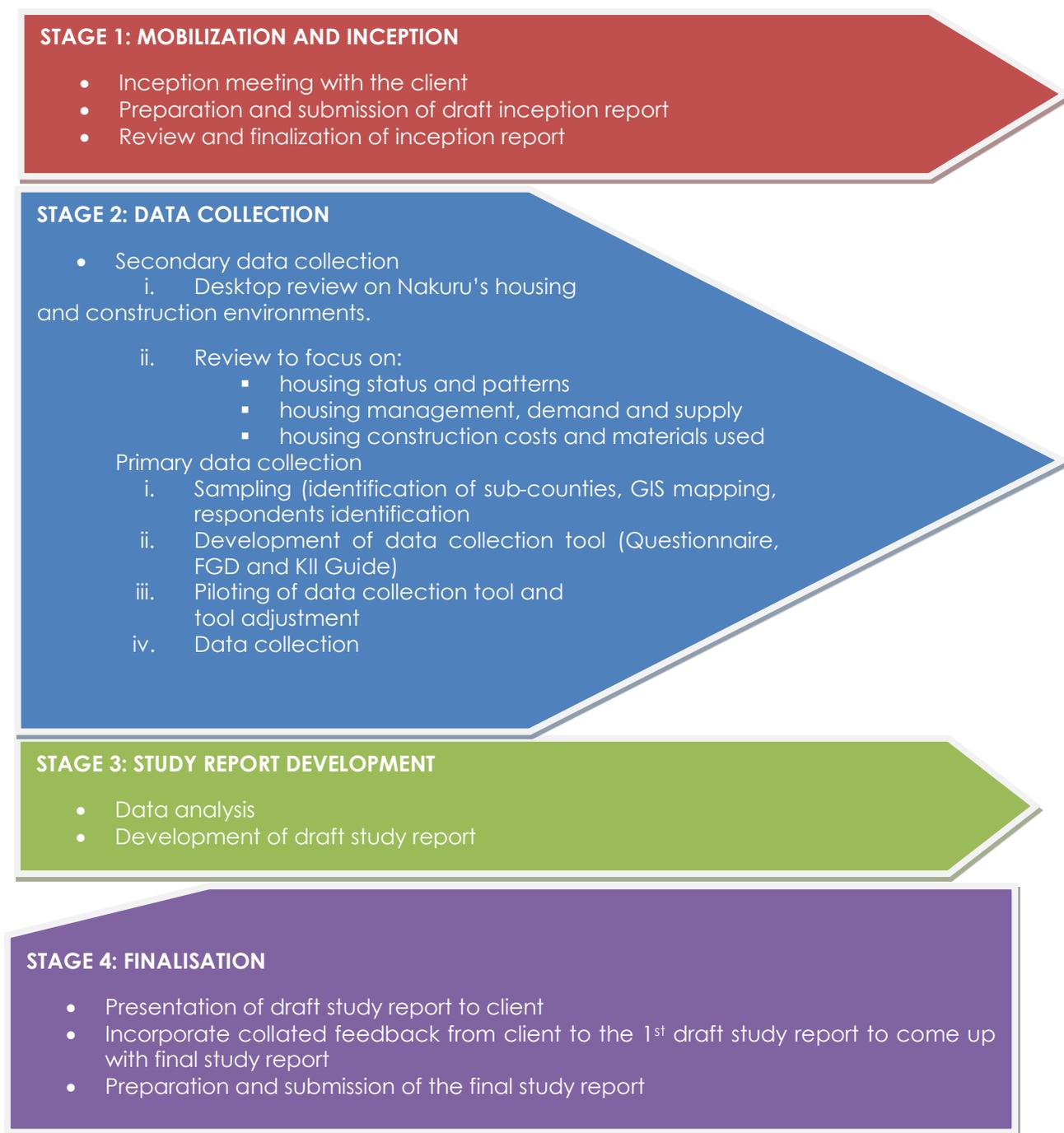|			
		environmentally sustainable, accessible, and well maintained. • Constitution of Kenya of 2010 provides that every person has a right to accessible and adequate housing, and to reasonable standards of sanitation • National Building Maintenance policy of 2015 is a roadmap to be followed in addressing effective restoration, preservation, refurbishment, setting standards, training and deployment of manpower, financing, enacting appropriate legislations, capacity building to both owners and users and establishment of instructional framework for the country's-built environment. Specifically, the policy aims to create awareness and build capacity on building maintenance, guide on efficient use of resources for maintenance and formulation of maintenance standards • National Housing Policy 2004 notes that lack of proper management and maintenance reduces quality of housing stock and adversely affects the built environment including infrastructural facilities and other services. The Policy proposes formulation of National guidelines and standards on real estate management and maintenance • The Sessional Paper No. 3 of 2016 on National Housing Policy ensures progressive realization of the right to accessible and adequate housing and reasonable standards of sanitation for every person as per Article 43 of the Constitution. The policy also intends to arrest the deteriorating housing conditions countrywide and bridge the shortfall in housing stock arising from demand that far surpasses supply particularly for low-income housing in urban areas.	• Inadequate trained maintenance personnel and tools/equipment to execute maintenance operations • Inadequate budgetary provisions for maintenance from the treasury of public building stock • There is no organized system for mobilizing building maintenance funding in Nakuru County

		• The Sessional Paper No. 3 of 2016 on National Housing Policy establishes a framework that enables the National Social Housing Development Fund to support research and slum upgrading. The policy also promotes funding of collaborative research on the development of low-cost building materials and construction technologies	

3. Study methodology

3.1   Stagewise Methodology

KIPPRA adopted a participatory approach to achieve the objectives of the study as outlined in this section. Particularly, the assignment was undertaken in four stages as depicted in Figure 3.1.

Figure 3.1: Stagewise methodology

STAGE 1: MOBILIZATION AND INCEPTION

- Inception meeting with the client
- Preparation and submission of draft inception report
- Review and finalization of inception report

STAGE 2: DATA COLLECTION

- Secondary data collection
    i.   Desktop review on Nakuru's housing and construction environments.

    ii.   Review to focus on:
        - housing status and patterns
        - housing management, demand and supply
        - housing construction costs and materials used
- Primary data collection
    i.   Sampling (identification of sub-counties, GIS mapping, respondents identification
    ii.   Development of data collection tool (Questionnaire, FGD and KII Guide)
    iii.   Piloting of data collection tool and tool adjustment
    iv.   Data collection

STAGE 3: STUDY REPORT DEVELOPMENT

- Data analysis
- Development of draft study report

STAGE 4: FINALISATION

- Presentation of draft study report to client
- Incorporate collated feedback from client to the 1st draft study report to come up with final study report
- Preparation and submission of the final study report

3.2 Study design, sampling and data collection

This study employed a mixed-methods approach, combining both primary and secondary data to comprehensively assess the housing status in Nakuru County. The Methodology was designed to gather detailed quantitative and qualitative information from various sources, ensuring a robust analysis of the current housing landscape. Primary data was collected through three main methods: Household surveys, key informant interviews, and focus group discussions. The household survey sought to gather quantitative data on the housing status, including types of housing, ownership, occupancy rates, and access to basic social amenities. A stratified random sampling technique was employed to select households across 23 urban centers within Nakuru County. The stratification was based on geographic location and population densities to ensure a representative sample. A total of 832 households responded to the survey, representing "high density areas", "medium density areas" and "low/sparse density" areas across the 11 sub-counties. This was guided by Akiba Mashinani Trust (AMT) satellite imagery across the urban and peri-urban regions of the County.

Key Informant Interviews (KIIs) were also conducted to obtain in-depth insights from stakeholders involved in the housing sector, including government officials, real estate developers, professionals, financiers and service providers for basic amenities such as water, and electricity. A purposive sampling was used to select 30 key informants who possess extensive knowledge and experience in housing policy, urban planning, and community development within Nakuru County. Semi-structured interviews were conducted, allowing for flexibility in exploring various themes related to housing policies, challenges, and opportunities.

A focus group discussion (FGDs) was conducted to facilitate a deeper understanding of the perceptions, attitudes, and experiences of key players in the housing sector, including contractors, professionals, local housing developers, and key government institutions involved in the housing development value chain. About 30 participants were selected using snowball sampling to ensure a diverse range of perspectives.

Secondary data from Nakuru County Department of Housing and Urban Development, and the Kenya National Bureau of Statistics (KNBS) were also used to supplement the primary data collected.

3.3 Data Analysis

The household survey data was analysed, focusing on key variables such as housing status and patterns, affordability, and access to services. Appendix 1 provides a summary of household characteristics interviewed in the survey.

Qualitative data from key informant interviews and focus group discussions was analysed using thematic analysis to identify patterns and insights related to stakeholder perspectives on housing issues. The study employed data triangulation to integrate findings from both primary and secondary sources, ensuring a comprehensive and reliable understanding of the housing status in Nakuru County.

3.4 Construction of Multidimensional Housing Deprivation Index

The Multidimensional Housing Deprivation Index (MHDI) was used to examine the level of housing deprivation in the County. This is based on the Alkire-Foster (AF) methodology as described by Alkire *et al*. (2015), that is designed to assess housing deprivation across several dimensions. This approach enables the identification of households that are deprived in specific indicators and evaluates the number and severity of deprivations in multiple dimensions at a set threshold. The thresholds are established using international benchmarks, such as those from the Sustainable Development Goals (SDGs), to determine the minimum acceptable levels of satisfaction. The MHDI framework is valuable for measuring the frequency and intensity of various housing deprivations, thereby serving as an important tool for informing policy decisions and interventions.

3.4.1 MHDI key steps

a) Indicator Selection

The MHDI framework fundamentally measures the various housing deprivations that a household might experience. It consisted of eight dimensions and ten indicators that reflect access to essential amenities and the quality of housing materials and conditions. These indicators included access to modern cooking fuel, electricity for lighting, clean and safe drinking water, toilet facilities, solid waste management, and housing conditions such as the materials used for floors, roofs, and exterior walls, and household crowding characteristics. Additionally, it considered access to household conveniences like the Internet.

b) Indicator Deprivation Cut-offs

Each indicator in the MHDI had a designated deprivation cut-off. A household was considered deprived in a specific indicator if its characteristics fell below this cut-off threshold. These thresholds, typically denoted as z_i such that a household i is considered deprived if its achievement level for a given indicator is less than the cut-off, $x_i < z_i$. While setting these cut-offs requires well-justified reasoning (Alkire et al., 2015), the study determined the deprivation cut-offs based on internationally

recognized standards, such as those set by the Sustainable Development Goals (SDGs), as well as the current policy priorities outlined in Kenya's Vision 2030.

c) Indicator Weights

After selecting the indicators and their respective cut-offs, the next step involves assigning weights to each indicator. Using the normative weighting strategy from Alkire and Fang (2018), the MHDI applied equal weights to each dimension, assigning each a weight of 1/7. Within each dimension, the indicators were also equally weighted. Specifically, indicators within the dimensions of cooking, lighting, water, waste management, and ICT each received a weight of 1/7. Indicators within the housing composition dimension were assigned weights of 1/21. These weights were structured so that the total weight across all dimensions and indicators summed to 1, as detailed in Table 3.1.

Table 3.1: Multidimensional housing deprivation index for Nakuru County

Dimension	Indicators	Deprivation cut-off (Households deprived if..)	Weights
Cooking (1/8)	Cooking fuel	Households use cooking fuel other than LPG, electricity, ethanol or biogas	0.125 (1/8)
Lighting (1/8)	Source of lighting	Households have no access to electricity through grid /solar/	0.125 (1/8)
Water (1/8)	Safe and improved drinking water	Households have no access to safe and improved drinking water from piped supplies with tap water in their dwelling, yard or plot; or public standposts) and non-piped supplies (such as boreholes, protected wells and springs, rainwater and packaged or delivered water) Time to the source of drinking water is 30 minutes or less.	0.125 (1/8)
Sanitation (1/8)	Improved sanitation	Households have no access to safely managed sanitation from improved nonpublic toilet facility (flush to piped sewer and septic tanks)	0.125 (1/8)
Waste management (1/8)	Solid waste disposal arrangement	Households have no access to government garbage collection services.	0.125 (1/8)
Housing composition (1/8)	Housing roofing material	Household main dwelling unit with natural/ rudimentary roof including Grass/Twigs/ Makuti/Thatch/ Bamboo/Wood/ Mud/Plastic/	0.0417 (1/24)

		Polythene/Dung / Mud/Tin cans/ Canvas/ Tents/ Nylon/ Cartons/ Cardboard and Shingles	
	Type of housing wall material	Households main dwelling unit with natural/ rudimentary wall material including cane/ palm/ trunks grass/ reeds mud/ cow dung stone with mud covered adobe uncovered adobe plywood/ cardboard off cuts/ reused wood/ wood planks, iron sheets, canvas/ tents nylon/ cartons/ timber	0.0417 (1/24)
	Housing floor material	Household main dwelling unit floor material is earth/ sand, dung, wood planks, and palm/bamboo	0.0417 (1/24)
Overcrowding (1/8)	Household Crowding	Crowding occurs if there is more than one person per room; severe crowding occurs if there are more than 1.5 persons per room (excluding bathrooms, balconies, porches, foyers, hallways and half-rooms) (American Crowding Index)	1/8
Information Communication Technology (1/8)	Access to Internet	Households with no access to Internet in their home	0.125 (1/8)

Source: Adopted from the Kenya Vision 2030 and UN, SDG global indicators

d) Scoring for MHDI

Each household is assigned a deprivation score based on the number of deprivations they experience across the indicators. The deprivation score is calculated by taking a weighted sum of the deprivations for each household. The resulting score ranges from 0 to 1, where a higher score reflects a greater number of deprivations. The score reaches its maximum value of 1 if the household is deprived in all ten indicators, and a household with no deprivations receives a score of 0. Formally, the deprivation score

MHDI_i for household i can be expressed as:

$$\text{MHDI}_i = I_1 w_1 + I_2 w_2 + \cdots + I_9 w_9$$

Where:

MHDI_i is the overall deprivation score for a household, I is the indicator variable, and w_i is the weight attached to indicator i.

4. An analysis of housing status and patterns in Nakuru County

This section analyses the household and housing characteristics of the sampled population to give the status and patterns of housing across the Nakuru County. The section focuses on the household characteristics, housing status, disparities and levels of deprivation in access to basic infrastructure across the county.

4.1   Status of housing

Housing type, especially in urban areas, is critical in unveiling housing dynamics in urban areas, mainly associated with household socio-economic status. The results reveal that a majority of residents in Nakuru County live in flats/apartments (30%), and compound houses sharing facilities (27.4%). The proportion of households living in compound houses not sharing facilities were 19.5 per cent while those living in bungalows and maisonettes were 8.1 per cent and 1.7 per cent respectively. Notably, about 6.4 per cent of the population live in shanties (Figure 4.1 c). Shanties are found in slums and informal settlements and a key indicator of the housing problem and lack of proper planning in the housing sector.

Tenure refers to the proprietary status under which households occupy a dwelling. According to figure 4.1a, a majority of households in Nakuru County Urban centres live in rented/provided houses (75 per cent). About 23 per cent of households live in owned houses while 1.2 percent are squatters. The owner-occupied houses are mainly acquired through construction (43%), followed by purchase (37%) and inheritance (18%) (Figure 4.1b). Nakuru County's housing market is primarily made up of tenants, which means affordable housing initiatives should focus on both homeownership and affordable rental options for those who prefer to rent.

Figure 4.1: Tenure Status of the Main Dwelling

a) Tenure status dwellings
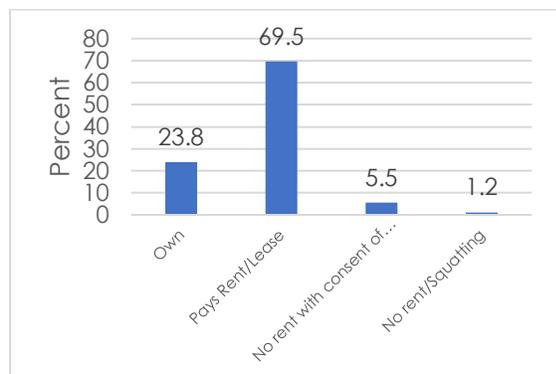
b) Main mode of acquiring owner occupier dwellings
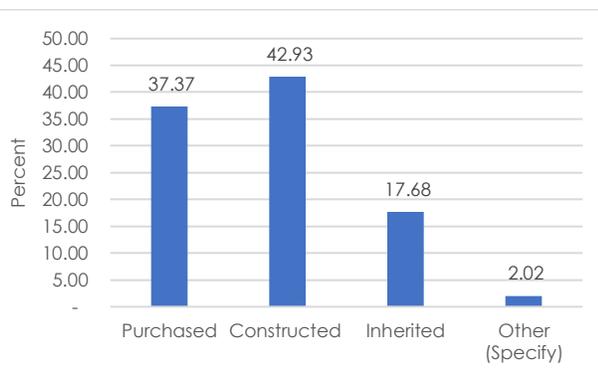
KIPPRA Survey 2024

A comparative analysis on tenure status was drawn from various studies as shown in Table 4.1. The three surveys conquer in that majority of the households in urban areas are renting the main dwelling unit they live in.

Table 4.1 Types of dwelling ownership

		2019 (KPHC)	2022 (KDHS)	KIPPRA Survey, 2024
Urban	Owns	22.8	21.6	23.3
	Pays Rent/Lease	77.2	73.4	70.1
	No rent with consent of owner		3.3	5.4
	No rent, squatting	0.0	1.7	1.2
Rural	Owns	74.1	76.9	-
	Pays Rent/Lease	25.9	17.4	-
	No rent with consent of owner		5.3	-
	No rent, squatting	0.0	0.4	-

Data source: Authors' calculations based on the 2019 Kenya Population and Housing Census (KPHC), Kenya Demographic and Health Survey 2022 (KDHS 2022) and the KIPPRA Survey (2024)

With most households residing in flats, about 96 per cent rent the housing units compared to 4 per cent who own the housing units in the flats. The same scenario applies to Swahili compound houses sharing facilities (89 per cent) and shanty (66%), while 8 per cent are squatters) with majority of households renting the units. Compared to the other dwelling units, bungalow (69%) and maisonettes (71%), and compound houses not sharing facilities (54%) had a significant proportion of the households owning the dwelling units. The results indicate that the majority of households in Nakuru County rent their dwelling units. Therefore, homeownership is far from the reach of a significant proportion of households (Figure 4.2).

Figure 4.2: Percentage distribution of households by type of housing and tenure status
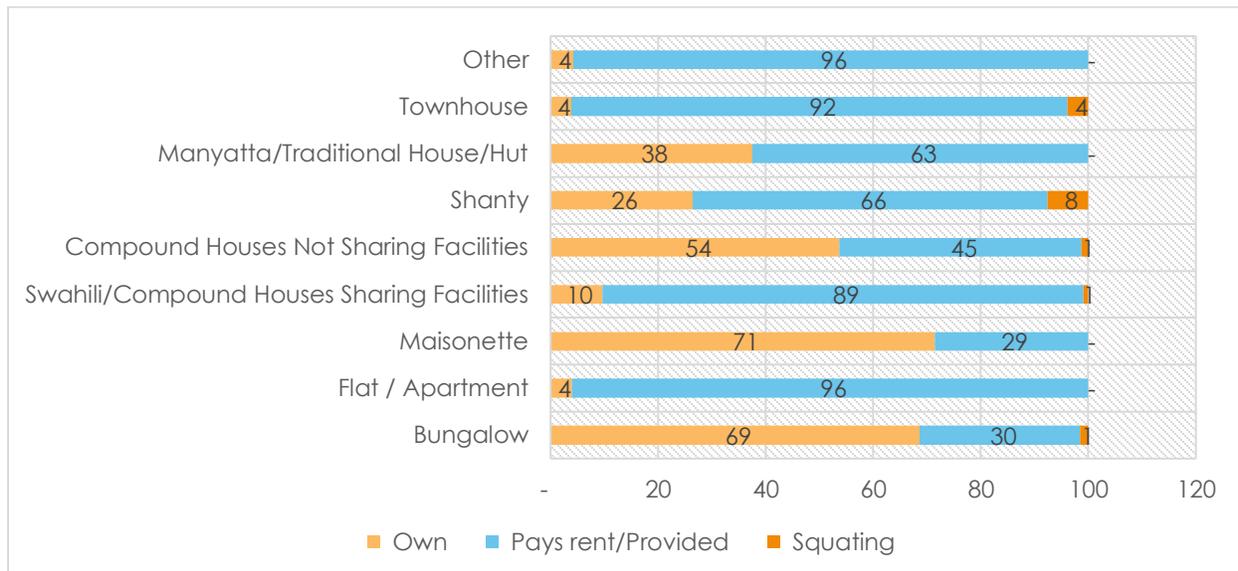
Source: KIPPRA Survey 2024

c) Housing Preferences Across Nakuru County Urban Centres
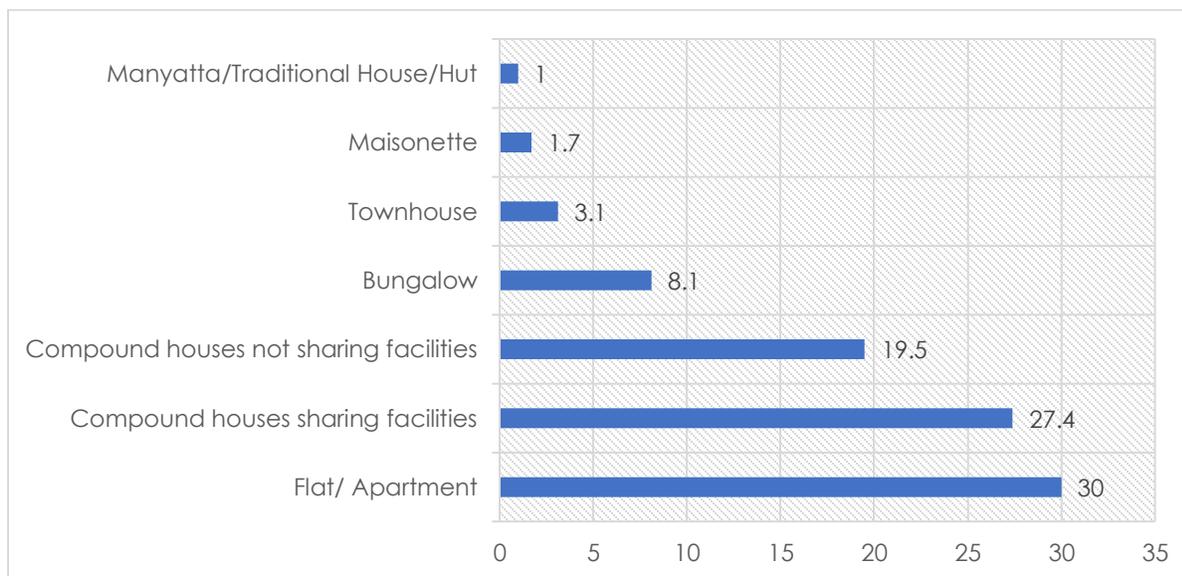
d) Main mode of acquisition for owner occupier purchased and constructed houses
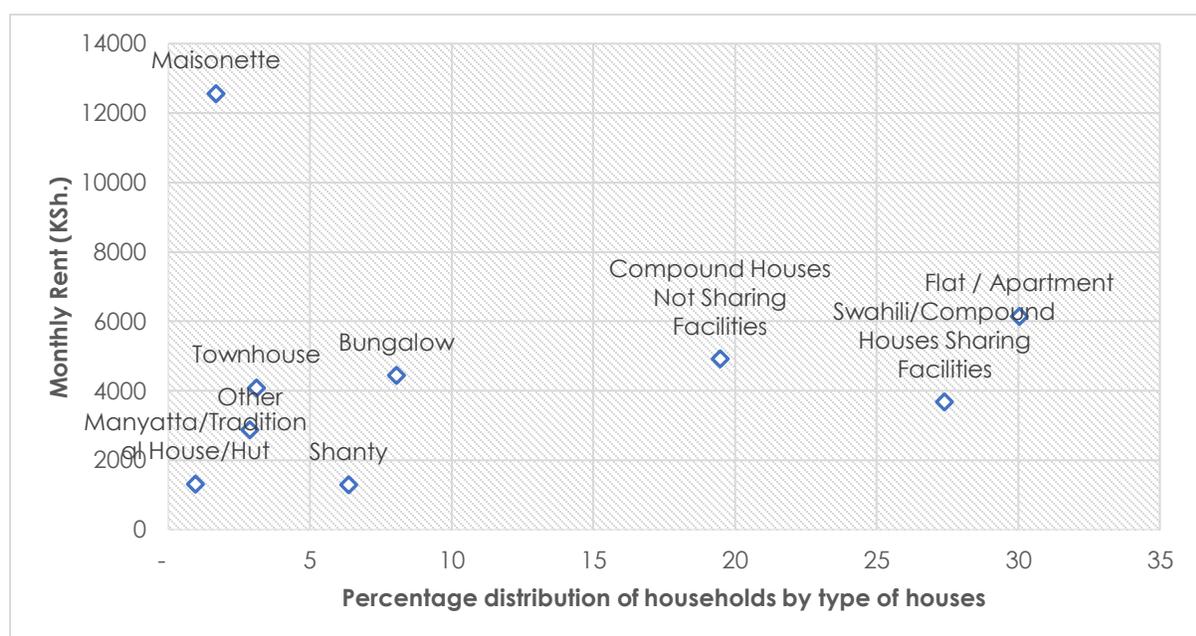
KIPPRA Survey 2024

It is important to note that the rental markets housing delivery systems are largely characterized by poorly serviced infrastructure networks and public services, highlighting the informal nature of the housing construction landscape. In Nakuru County, most households purchase housing units in cash (68.9%) and construct in cash (72.9%) compared to purchase and construction through loans (Figure 4.1d). This suggests that most households prefer to finance their homes through construction or purchasing with cash. Building a house is seen as more affordable than buying pre-built units, and high interest rates make construction loans costly. Many households opt to construct their own homes, as this approach allows for more flexibility in terms of time, design, and size, in addition to being a more cost-effective option compared to buying. The lower proportion of homeowners using loans could indicate barriers to accessing credit, such as stringent loan requirements, high-interest rates, or a lack of trust in financial institutions. This might suggest that many residents either do not qualify for loans or prefer not to engage with the formal financial system for home financing.

The financing model chosen for housing construction in Nakuru County affects the ultimate cost of the home. Using cash over an extended period often increases the overall expense due to inflation, material cost fluctuations, and delayed project timelines. In contrast, loan financing, despite associated interest, can enable quicker project completion, helping to lock in lower material costs and providing earlier occupancy or rental income. Thus, while cash financing may appear cheaper upfront, the potential for price increases over time often makes loan financing more cost-effective in the long term.

With most households renting, the rental market is dominated (71.9%) by rent of KShs. 5,000 and below. Low rental costs are closely associated with housing structures of poor-quality housing and are over-crowded and commonly found in the informal settlement areas. About 20 per cent of the households pay rent

ranging from KShs. 5,000 to KShs. 10,000; while 7.8 per cent pay rent above KShs. 10,000. Apartments recorded the highest home ownership rates (30%) with an average rent of slightly above KShs. 6,000. This is followed by Swahili compound houses with shared facilities (27%) with an average rent of about KShs. 3,688. Maisonettes are the least prevalent (2%) but attract the highest average rent of KShs. 12,575 (Figure 4.3) The findings indicate that most households in Nakuru County live in low-cost rental housing, often characterized by poor quality and overcrowding. Middle-income renters also face rising housing costs, highlighting the need for affordable housing solutions that cater to both low- and middle-income groups. Additionally, promoting apartment-style homeownership could be an effective strategy, as these units have higher ownership rates and offer a viable option for expanding affordable housing.

**Figure 4.3: Type of housing -Average Monthly Rent**

Source: KIPPRA Survey 2024

Analysis of habitable rooms by the tenure status indicates that most people live in one roomed house (figure 4.4), implying that a rented housing unit with a higher number of habitable rooms is likely to be costlier. Further, results indicate that, on average, owner-occupier households have a comparatively higher number of habitable rooms at 3.5 than rented dwelling units at 1.9 and 2.1 for households that either pay or do not pay rent. The average household size living in a single room stood at 3.3 persons, while those living in a two-roomed dwelling was 3.9 persons. From the preceding, the high proportion of households living in single rooms indicates aspects of overcrowding. Focusing on increasing the supply of affordable multi-room housing units is key to alleviating overcrowding in the rental

market. Implementing space standards and supporting the construction of larger units is crucial to addressing the high household sizes in single-room dwellings. Additionally, promoting housing development through incentives for building more and larger housing units can improve living conditions and reduce rental market pressures.

Figure 4.4: Percentage distribution of households by housing tenure and number of habitable rooms
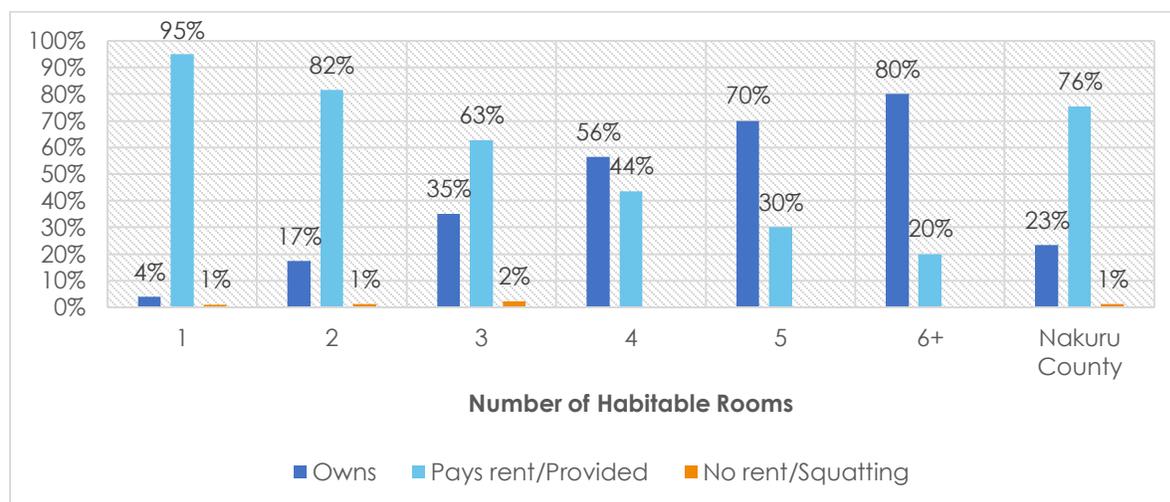
Source: KIPPRA Survey 2024

The study further examined the relationship between the rent incurred by a household and the dwelling unit type. The amount of rent paid has a direct relationship with the type of dwelling unit. The results indicate that households occupying flats cut across all the rent brackets (Figure 4.5). This is attributable to the dominancy of flats in the housing market, whose prices vary based on the unit location, size, and quality, among other factors. Bungalows and maisonettes are mainly in the higher rent brackets, while shanties and Swahili are in the lowest rent bracket of KShs. 5,000 and below.

Figure 4.5: Percentage distribution of households' type of dwelling unit and the monthly rent
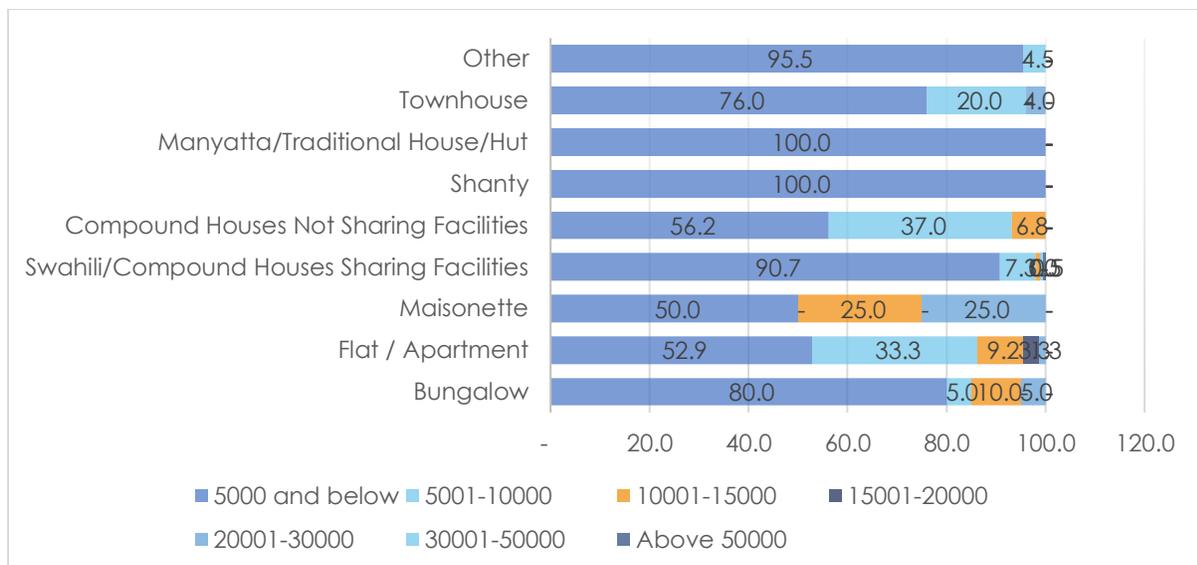
Source: KIPPRA Survey, 2024

As shown in Figure 4.6, most of the rental housing units are in Nakuru Town West (92.7%) followed by Nakuru Town East (86.9%) and Rongai (83%) among others. The proportion of households living in owned dwellings increase as one tends towards peri-urban and rural centres. Across the sub counties, Gilgil (42.9%), Molo (35.6%), Naivasha (33.5%), and Njoro (31.8%) have the highest home ownership rates as shown in Figure 4.6. The results indicate that house renting is the primary form of house tenure across urban centres in Nakuru County homeownership is far from the reach of most households.

Figure 4.6: Percentage distribution of households by tenure status
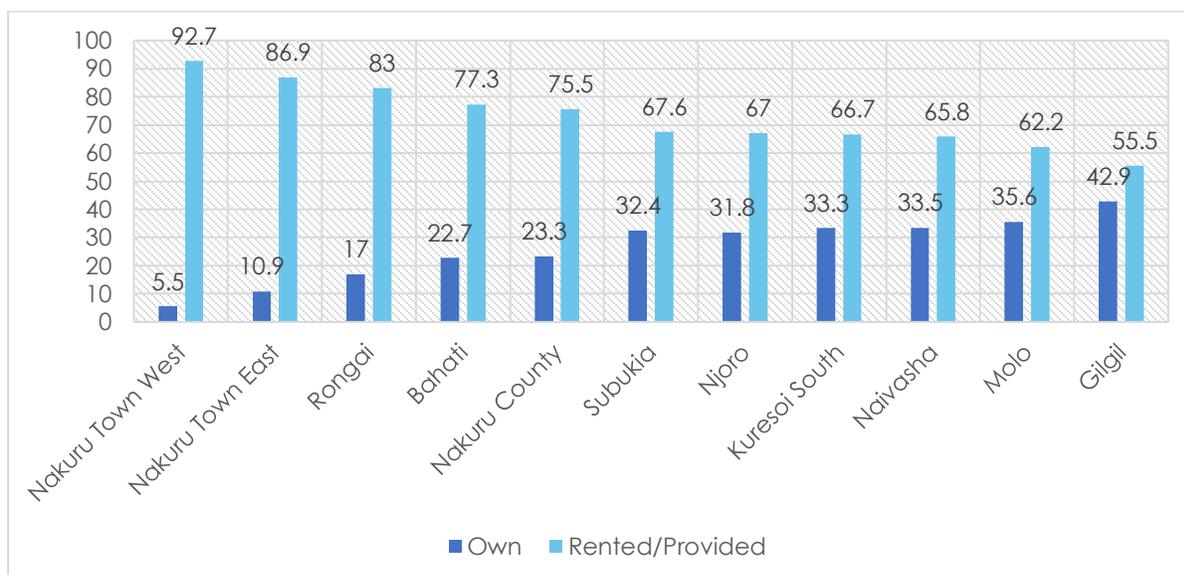
Source: KIPPRA Survey 2024

Disparities are also noted across the sub-counties for the mode of acquisition of owner-occupied dwelling units. More than half of the homeowners in Kuresoi South (66.7% cent), Subukia (58.4%), Nakuru Town West (55.5%), Njoro (53.6%), and Molo (60%) have constructed their dwelling units. Most homeowners in Rongai (62.5%), Nakuru Town East (57.1%), and Gilgil (51.9%) have acquired their homes by purchasing the housing units. However, inheritance is more prevalent in Kuresoi South (26.7%), Subukia (25%), and Nakuru Town East (22.2%) which has some of the oldest estates in Nakuru County. Building a house is generally considered more affordable than purchasing a pre-built home, but high interest rates make it costly to obtain construction loans. Additionally, many households prefer constructing their own homes due to the high costs of buying and the flexibility it offers in terms of design, size, and timing.

Figure 4.7: Distribution of homeowners by mode of acquisition
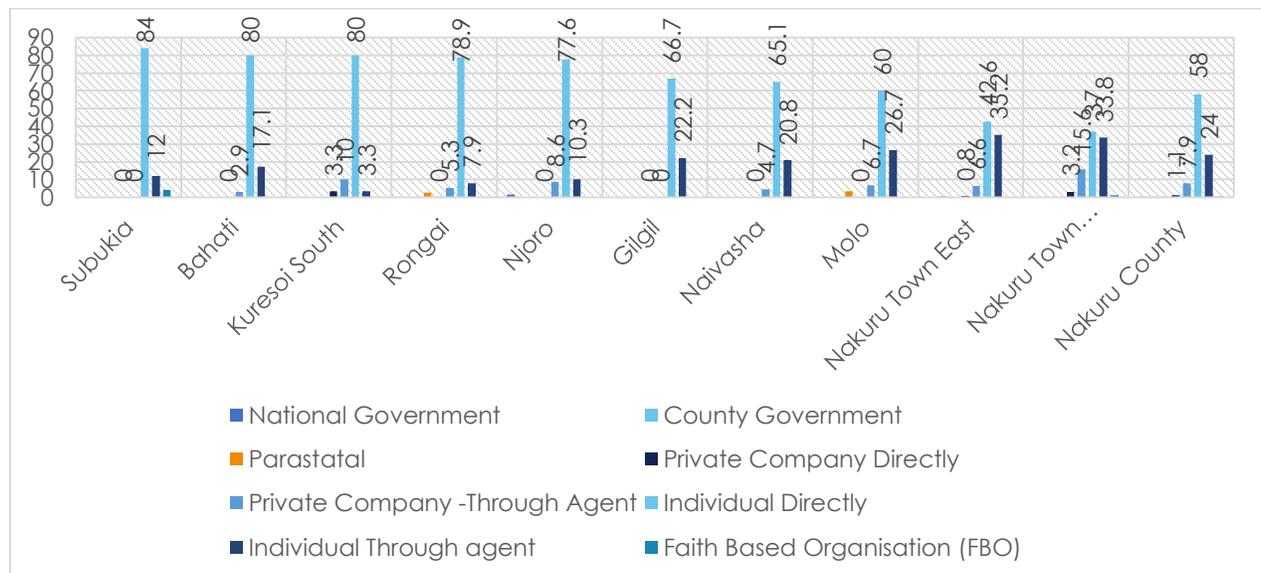

Source: KIPPRA Survey 2024

e) Private sector role in the Housing Delivery

Private individuals and companies play a key role in the delivery of housing in Nakuru, alongside the role played by the Nakuru County Government. As shown in Figure 4.8, individual developers are the most significant contributor to the housing units in each county, accounting for over 80 per cent of the housing units. This shows that the individual investors play a critical role in the provision of housing; however, there is a need to ensure that the planning and zoning regulations are adhered to. Private companies also contribute a relatively smaller but notable percentage with sub-counties such as Nakuru Town West (18.8%) and Kuresoi South (13.3%) showing a higher rate of private sector involvement.

Figure 4.8: Percentage distribution of households by provider of rental housing

Source: KIPPRA Survey 2024

## 4.2   Multidimensional housing deprivation index for Nakuru County

The Multidimensional Housing Deprivation Index (MHDI) serves as a vital framework for assessing the intricacies of housing deprivation in Nakuru County. By examining various dimensions of living conditions—cooking and lighting energy, source of drinking water, sanitation and waste management—the index illuminates the multifaceted nature of deprivation faced by households. This index not only identifies specific areas in need of improvement but also quantifies the severity and prevalence of these deprivations, ultimately guiding policymakers in making informed decisions.

a) Source of Cooking Energy

Clean cooking fuel is a key basic amenity for households and a critical component in ensuring adequate housing. Households relying on modern and clean energy sources including LPG, biogas, and electricity stood at 55.4 per cent while households deprived were reported at 44.6 per cent (Figure 4.8). Disparities show in the level of deprivation for various energy sources across the sub-counties. Generally, majority (52.6%) of households use LPG as the main cooking fuel in Nakuru County. Nakuru Town East (68.7%), Nakuru Town West (63%), and Naivasha (54%) recorded above average for Nakuru County, indicating that a significant proportion of the population use LPG. Notably, Bahati (31.8%), Njoro (38.6%), Kuresoi South (40%), Molo (40%), and Gilgil (46.8%) showed relatively lower usage of LPG and clean and modern sources of cooking energy.

The penetration of electricity, biogas and solar as clean and modern sources is low across the sub-counties, with only 1.4 per cent using electricity and 0.5 per cent relying on biogas, 0.1 per cent using solar cookers (Figure 4.8). Therefore, Nakuru County is ranked among the best performing counties in clean cooking fuel in Kenya. However, the pockets of energy poverty are evident across the sub-counties, especially in peri-urban centres. Therefore, there is need to undertake a location-specific intervention in promoting LPG by targeting the energy-deprived at a disaggregated level.

Figure 4.9: Percentage distribution of households by type of cooking fuel
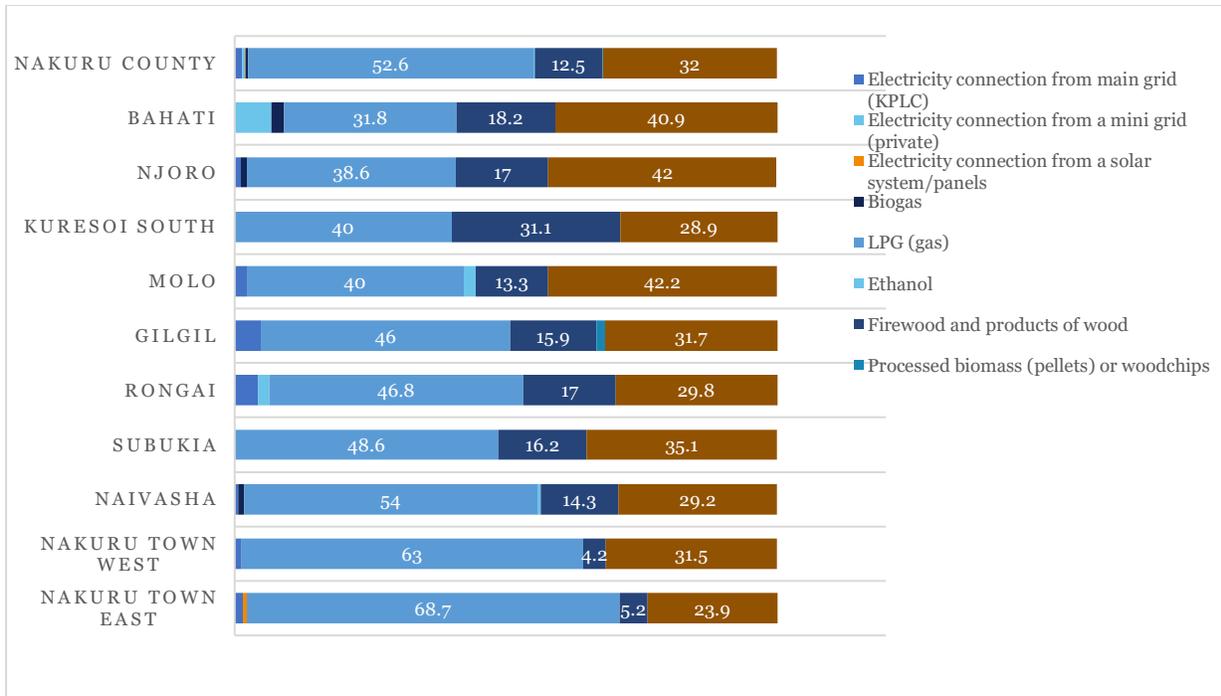
Source: KIPPRA Survey 2024

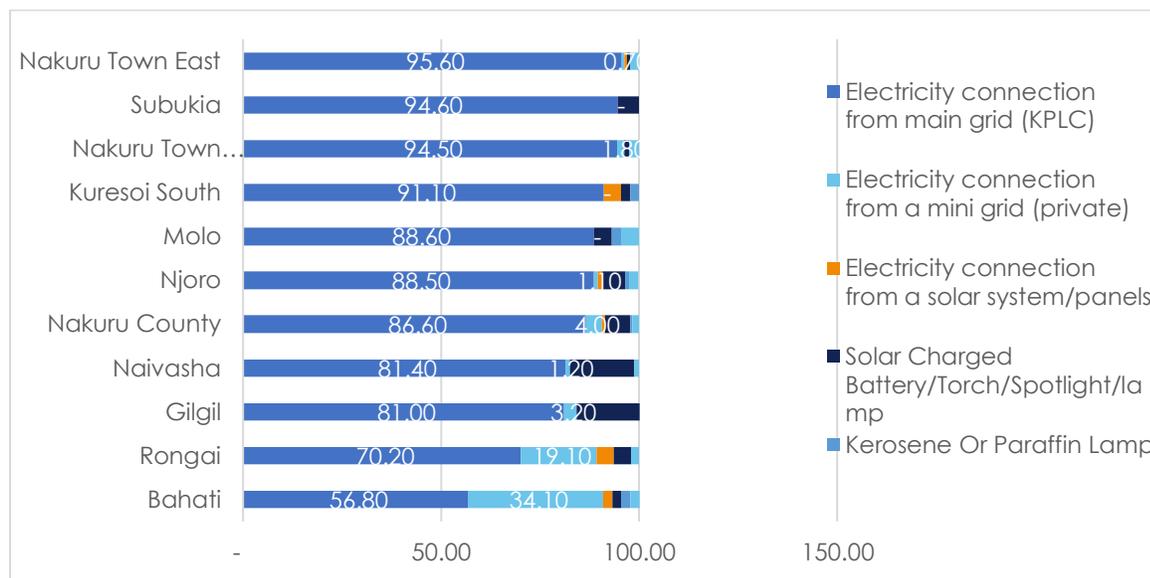Figure 4.10: Cooking fuel Deprivation levels by subcounty
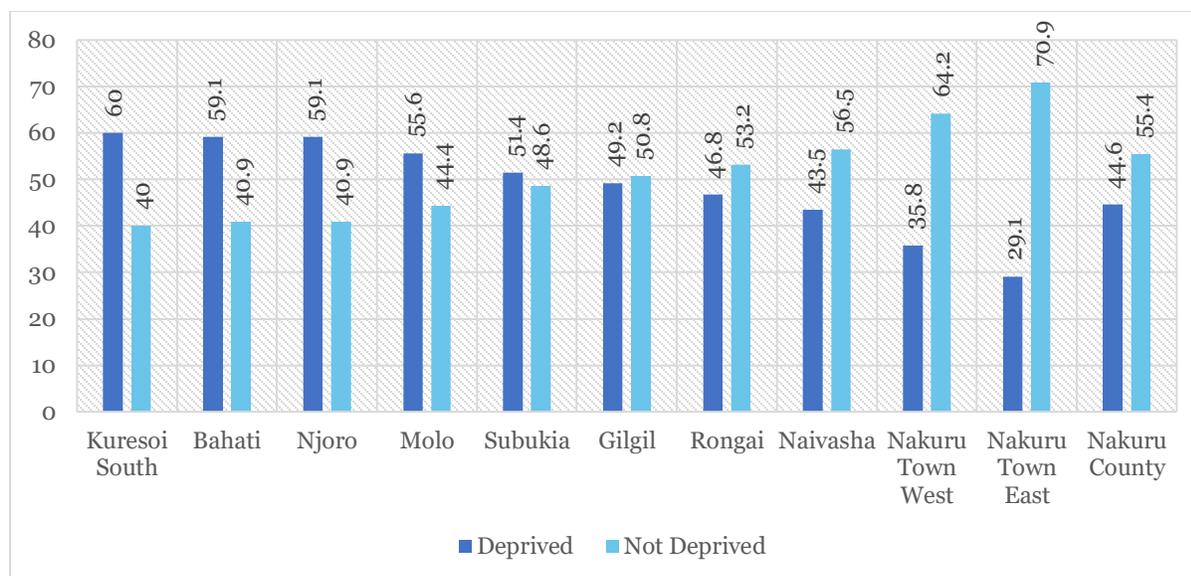
Source: KIPPRA Survey 2024

b) Source of lighting energy

Access to clean and modern energy sources for lighting is crucial for societal growth and significantly contributes to socio-economic development. Most households in the County rely on grid electricity, a clean and contemporary option for lighting. Majority of the households across the sub-counties use electricity from the grid, which is a clean and modern source for lighting. For instance, Nakuru Town East (95.6%), Subukia (94.6%), Nakuru Town West (94.5%), and Kuresoi South (91.1%) registered the highest access rates to electricity from the main grid. However, Bahati (56.8%), Rongai (70.2%), and Gilgil (81%) recorded access rates below the County Average (86.6%) as shown in figure 4.10.

Majority of the sub-counties with relatively lower access are mainly comprised of a peri-urban centres and rural centres, with informal housing that might not be suitable for electricity connection due to the low quality of the houses. However, some of the households cannot afford to pay electricity bills, hence prefer other lighting sources. Solar and biogas energy is an alternative clean energy source for lighting, which is used by a minimal proportion of households across the sub-counties. On average, majority (97.7%) of households in Nakuru County have access to clean energy sources for lighting and would be ranked among counties with highest access across counties. However, there are some households still relying on non-clean sources such as paraffin and wood. Other transitional lighting sources include battery, and solar charged torches are used in the County. In terms of deprivation to lighting, the sub counties recorded considerable low levels of deprivations as shown in figure 4.11.

Figure 4.11: Percentage distribution of households by type of lighting energy

Source: KIPPRA Survey 2024

Figure 4.12: Lighting Deprivation levels by sub county
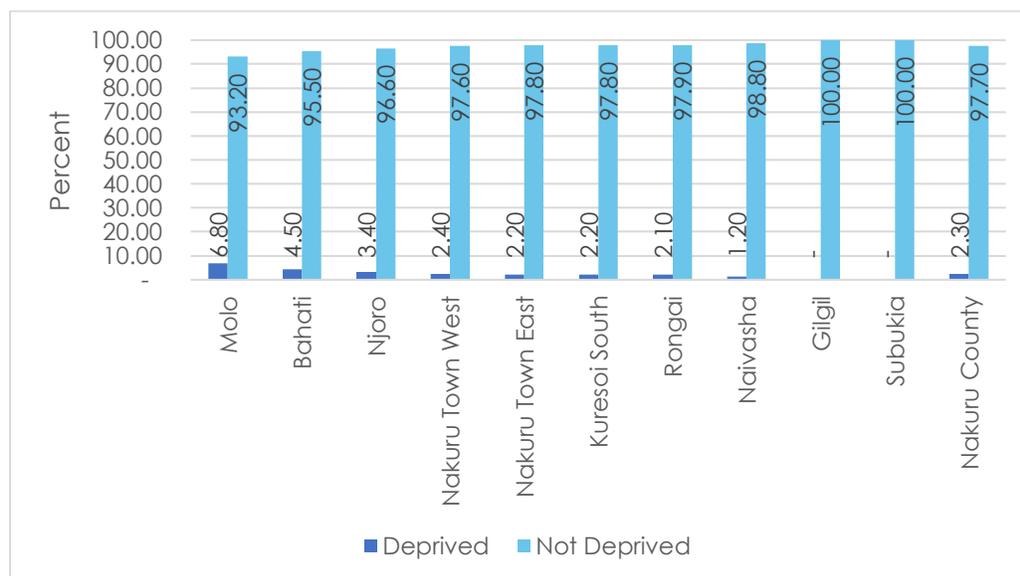
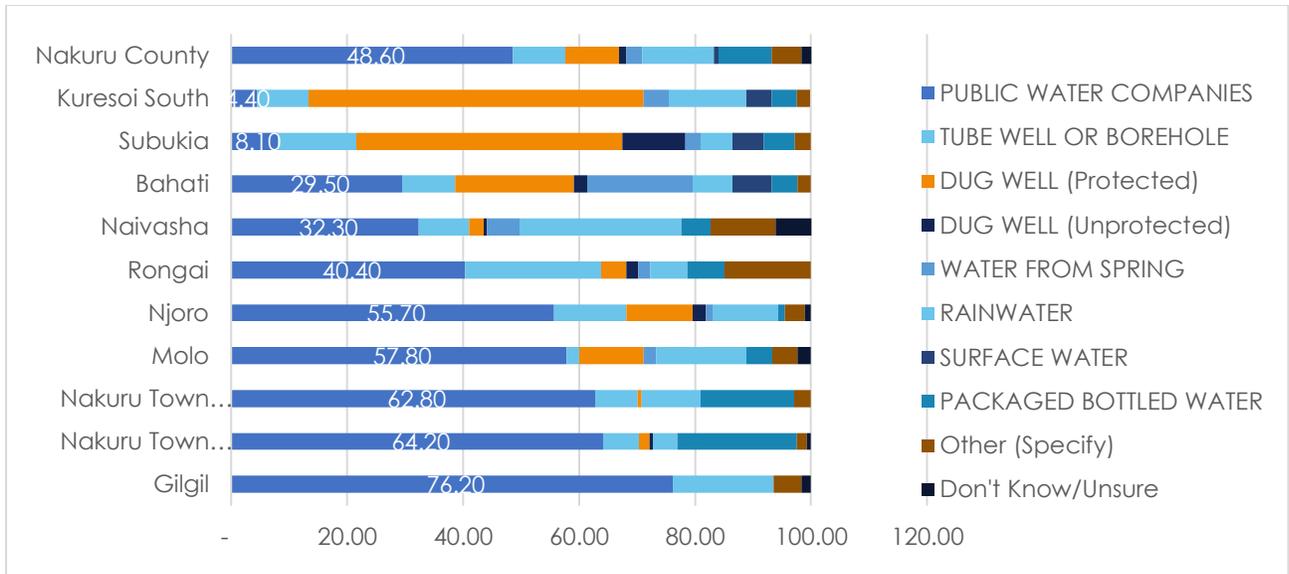Source: KIPPRA Survey 2024

c) Source of Drinking Water

Equitable access to safe and improved drinking water is one of the key targets for sustainable development goals. Improved drinking water sources includes sources that are protected from contamination by nature of their construction or through active intervention. A majority of the population (86.4%) are non-deprived, hence have access to improved water sources, including water from

piped supplies with tap water in their dwelling, yard, or plot; or public standposts) and non-piped supplies such as boreholes, protected wells and springs, rainwater, and packaged or delivered water (Figure 4.12).

The deprivation for access to water from improved water sources is highest in Bahati (29.5%), Naivasha (26.7%), Subukia (21.3%), and Rongai (21.3%), which showed deprivation. However, sub-counties hosting bigger urban areas such as Nakuru Town East (3.6%) Nakuru Town West (5.5%), and Njoro (8%) showed lower deprivation scores. Sub counties show disparities in access to various water sources. The majority (48.6%) have access to water piped into the yard/compound followed by 9.3 per cent with dug well (protected) and 9 per cent accessing water from tube wells or boreholes. The highest proportion of the population with water piped in their dwelling units are mainly from Gilgil (76.2%), Nakuru Town West (64.2%), Nakuru Town East (62.8%), Molo (57.8%), and Njoro (55.7%). Notably, the majority of the population living in areas peri-urban centres and rural centres depend on boreholes and wells; Kuresoi South (66.7%), Subukia (59.4%), and Bahati (29.6%) as shown in Figure 4.12.

The lack of and irregular supply of piped water in certain areas is due to inadequate planning of drainage and piping systems during construction and the deterioration of existing infrastructure. Additionally, many rental properties are poorly built with insufficient water and sewage piping. Limited rain harvesting practices are observed, partly because most rented homes lack facilities for this method. Implementing rooftop water harvesting could address water shortages for household needs when treated, and the housing sector should adopt green standards like water harvesting as outlined in the National Water Harvesting and Storage Regulations, 2019.

Figure 4.13: Percentage distribution of households by source of drinking water

Source: KIPPRA Survey 2024
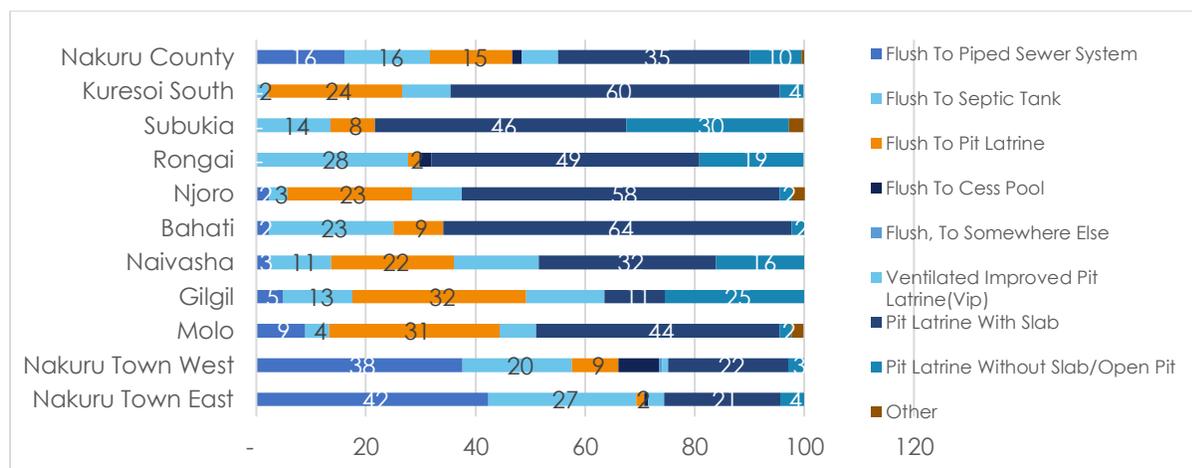
Figure 4.14: Water Deprivation levels by subcounty
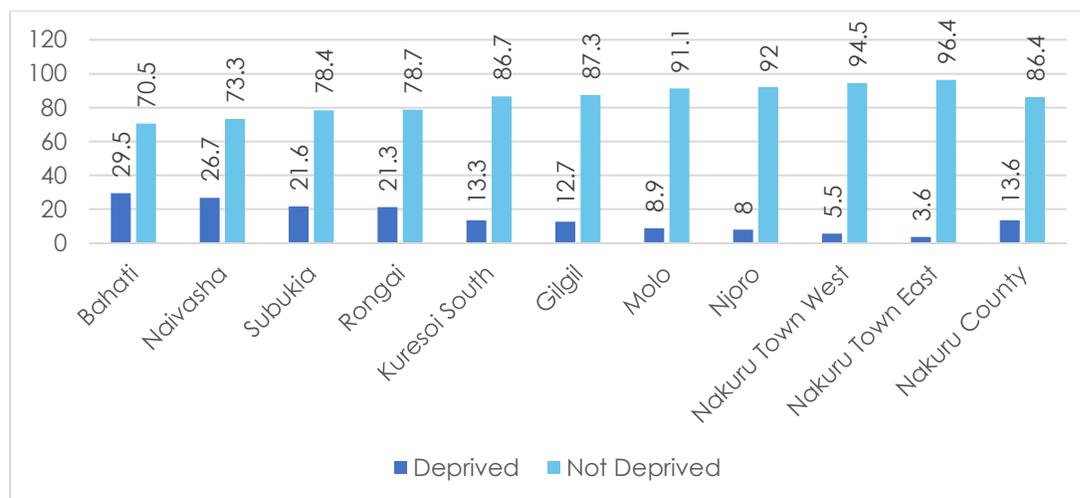
d) Improved sanitation facilities

Access to basic improved and safely managed sanitation is also critical to the health and well-being of individuals and communities. This is because sanitation facilities play a key role in ensuring hygienic separation of human excreta from human contact. Overall, 44.1 per cent of the population are non-deprived, while 55.9 per cent are deprived of safely managed sanitation, with the highest deprivation reported in Gilgil (84.1%), Subukia (64.9%), Nakuru Town East (64.2%), and Nakuru Town West (54.5%).

About 16 per cent of the households in Nakuru County are connected to the sewer system, while 16 per cent flush to septic tanks, 15 per cent flush to pit latrine, and 35 per cent use pit latrine with slab. Biodigester and bio-septic, which are modern as sustainable wastewater management, show low adoption in Nakuru County. Biodigesters can also be used to generate power for heating and lighting. Despite a significant proportion of the population having access to basic sanitation, the majority are still lagging with disparities spread out across all the sub-counties.

Figure 4.15: Percentage distribution of households by type of sanitation facilities

Source: KIPPRA Survey 2024

Figure 4.16: Sanitation Deprivation levels by subcounty
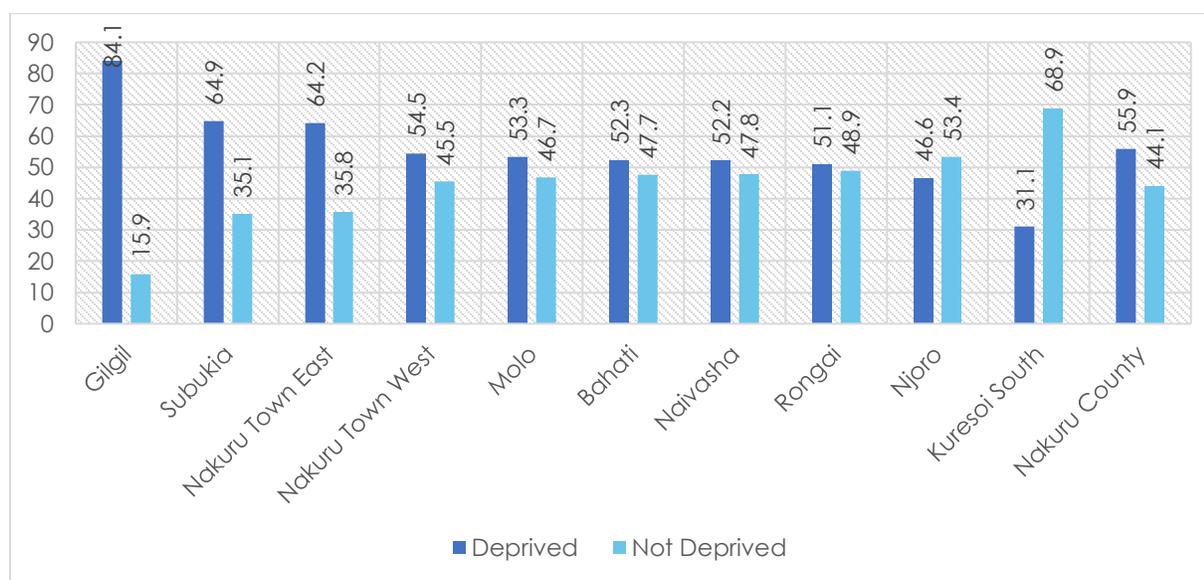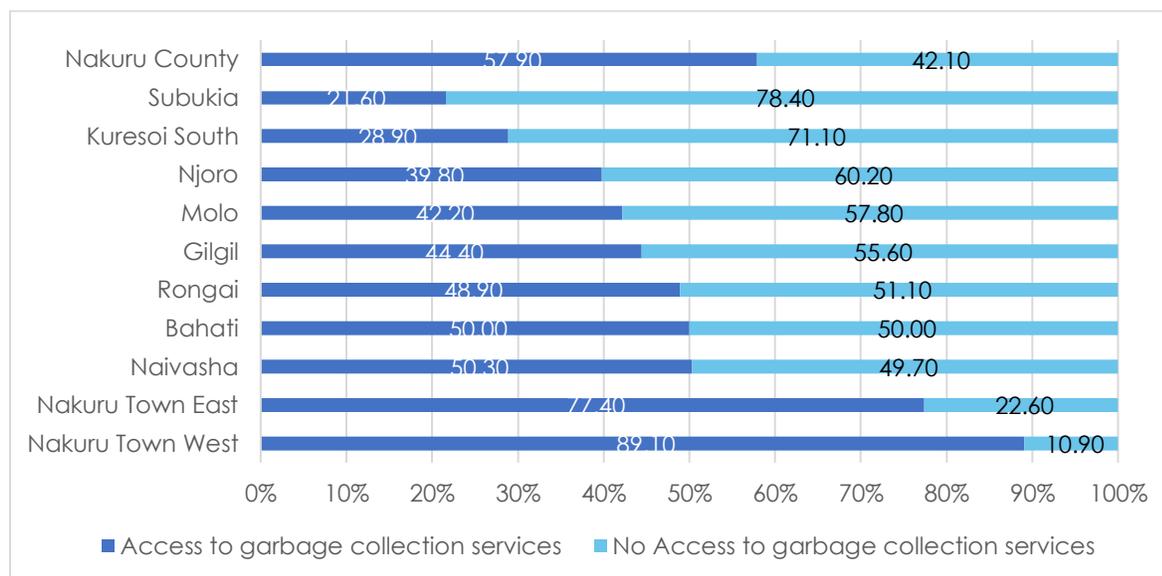

Source: KIPPRA Survey 2024

e) Access to Waste management

Sustainable access to sanitation, including controlled waste disposal facilities, is a crucial basic need for households. Waste poses a threat to public health and the environment if it is not stored, collected, and disposed of properly. In Nakuru County, 57.9 percent of households have access to government garbage collection services, while 42.1 percent are deprived. The disparities vary across the sub-counties as sub-counties such as Subukia (78.4%), Kuresoi South (71.1%), Njoro (60.2%), and Molo (57.8%) have highest deprivation rates. On the other hand, Nakuru town west (10.9%), Nakuru town east (22.6%), Naivasha (49.7%), and

Bahati (50%) have the lowest deprivation rates. The county government of Nakuru can tailor its initiatives to address disparities in waste collection services by expanding coverage to areas with high deprivation rates, such as Subukia and Kuresoi South. Investment in infrastructure and resources is needed to improve waste management services across all areas.

Strengthening sanitation standards will help protect public health and the environment from improper waste disposal. It is important to note that solid waste management involves multiple sectors and stakeholders, requiring a cohesive policy integration and multisectoral approach to be effective. The National Sustainable Waste Management Act 2021 provides for waste collection, separation, recycling, and secure disposal, including the segregation, storage, transportation, treatment, and final disposal of waste. The role of County Governments in relation to the implementation of the devolved function of waste management is well articulated, especially as it relates to the establishment of waste management infrastructure to promote source segregation, collection, re-use, and set up for material recovery.

Figure 4.17: Percentage distribution of households by access to government garbage collection services

Source: KIPPRA Survey 2024

Figure 4.18: Waste Management Deprivation levels by subcounty
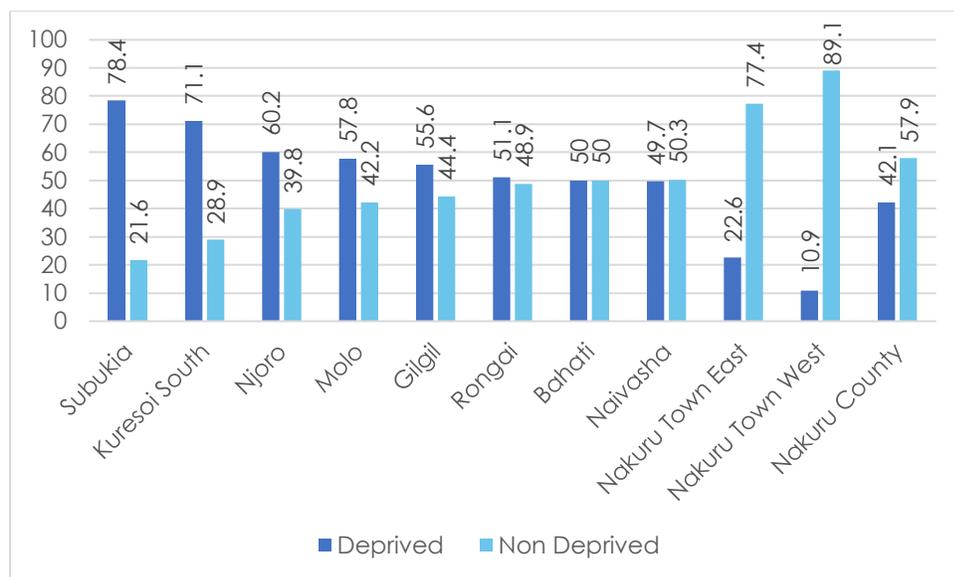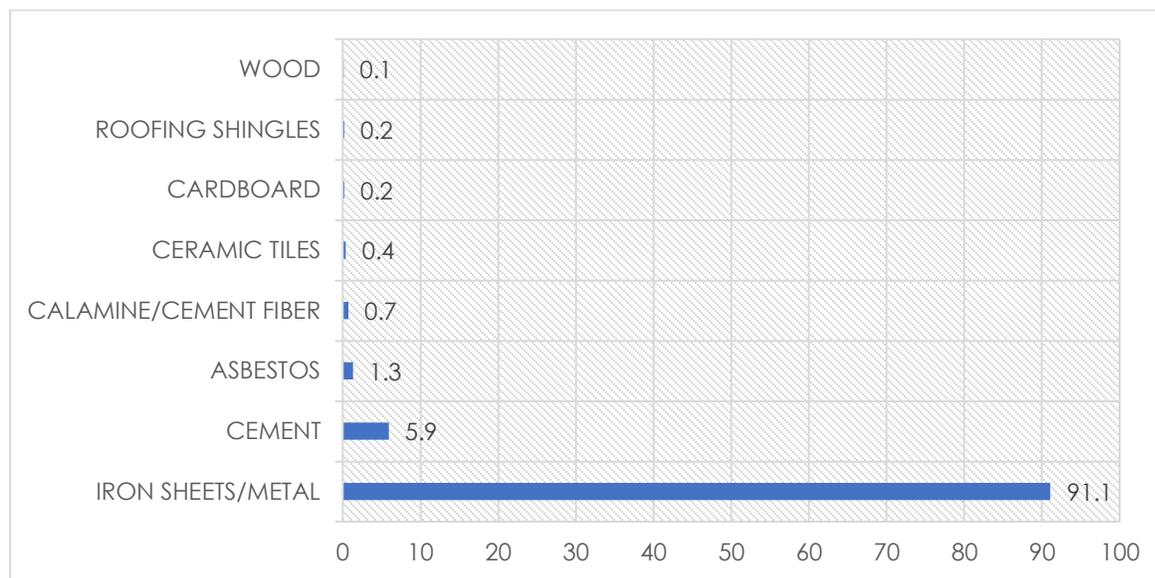

Source: KIPPRA Survey 2024

f) Housing Composition

This subsection describes the housing composition of the dwelling units found in the urban centres in Nakuru County. These include the type of roofing, wall, and floor materials. Further, the analysis demonstrates deprivation levels in various sub counties.

i) Housing roofing material

Based on the KIPPRA survey 2024, most households in Nakuru County have dwelling units with roof made of finished and durable materials (99.6%). Iron sheets make up the predominant (91.1%) roofing materials, followed by cement (5.9%) and asbestos (1.3%). However, about 0.3 per cent of households in the County live in dwellings with low quality roofs whose materials include wood and cardboards. This shows that despite the high level of urbanization in the county, the County still has households residing in low-quality dwelling units that need support through affordable housing programmes to access decent housing units.

Figure 4.19: Predominant Roof material of the main dwelling

KIPPRA Survey 2024

The majority (99.4%) of households have durable roofing material and are spread out across the sub-counties (Figure 4.19 and Figure 4.20). However, a small proportion is still relying on rudimentary roofing materials including tin cans and cartons.

Figure 4.20: Percentage distribution of households by predominant material of the roof
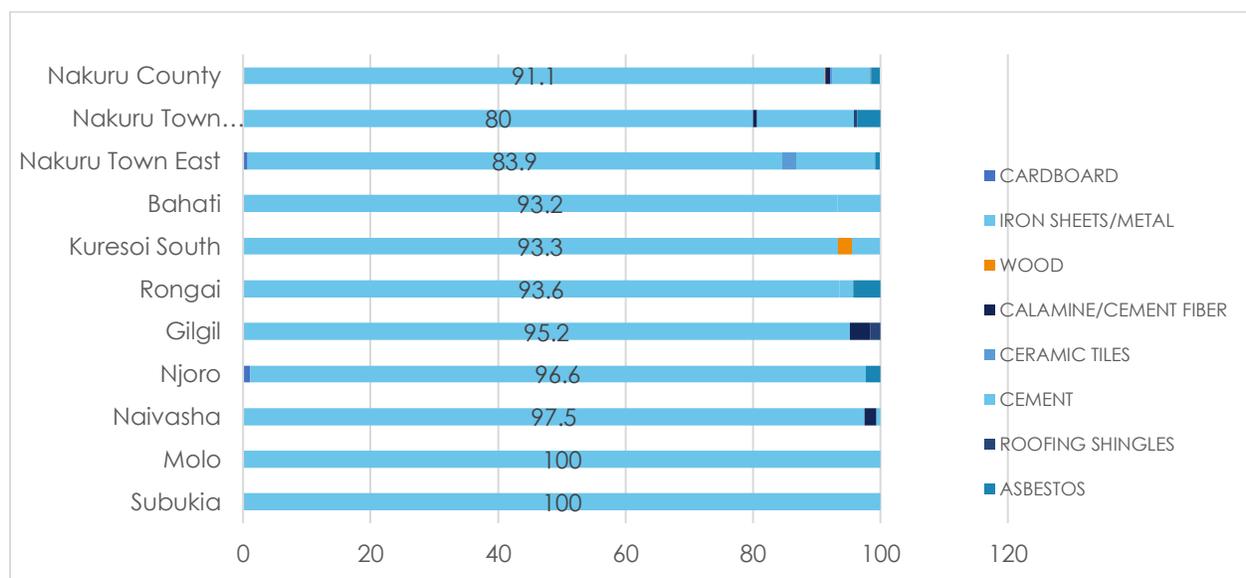
Source: KIPPRA Survey 2024

Figure 4.21: Roof Deprivation levels by subcounty
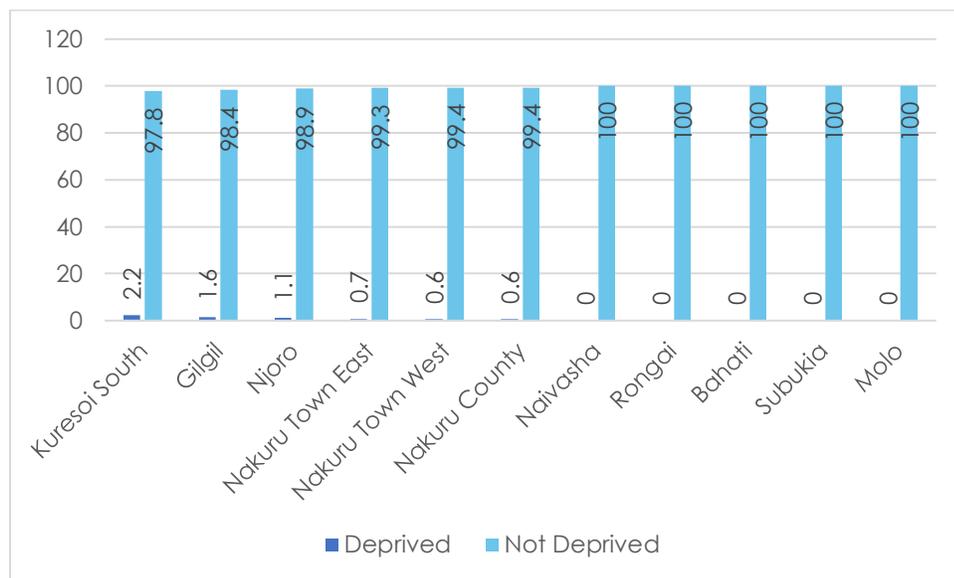
Source: KIPPRA Survey 2024

It is noted that the wall material in most of the houses indicate lower housing quality standards across the sub-counties. Majority of deprived households are in Njoro (17%), Rongai (12.8%), Subukia (10.8%), and Molo (9.1%). Naivasha (6.2%), Nakuru Town West (3%), and Nakuru Town East (1.5%) showed the lowest deprivation rates.

Figure 4.22: Percentage distribution of households by predominant material of the wall

Source: KIPPRA Survey 2024

ii) Housing wall materials

The KIPPRA survey 2024 revealed that a majority of households in Nakuru County have dwelling units with walls made of finished and durable ma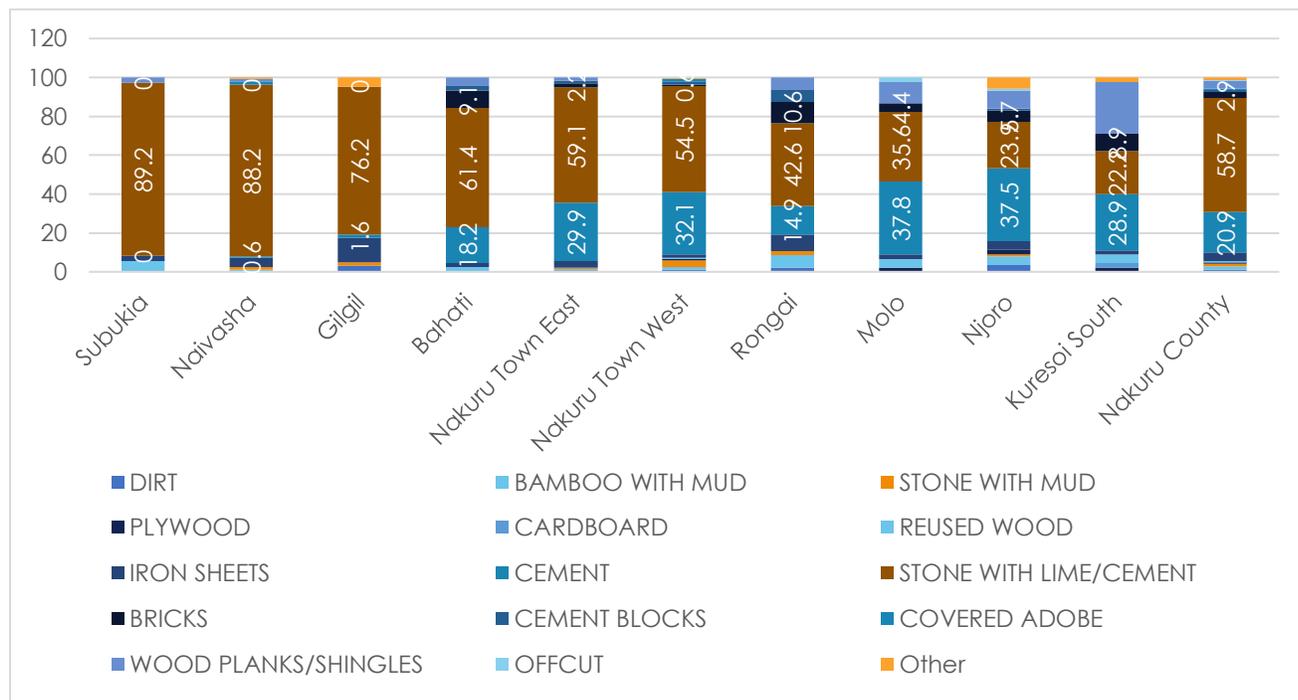terials (83.8%). The predominant wall material in use in Nakuru County is stone with lime/cement which accounts for 58.7 per cent of all the sampled houses in the county. About 20.9 per cent of the household dwelling were reported having cement, while 2.9 per cent had walls made of bricks. Notably, about 16.2 per cent of the population were wall deprived with predominant wall materials ranging from iron sheets (4.3%), wood planks/shingles (4.2%), bamboo with mud (1.6%), and offcuts (0.2%), among others. The low-quality building materials are more predominant sub counties such as Njoro (17%), Rongai (12.8%), Subukia (10.8%), and Molo (9.1%).

Figure 4.23: Predominant Wall material of the main dwelling

KIPPRA Survey 2024

Figure 4.24: Wall Deprivation levels by sub county

Source: KIPPRA Survey 2024

The study shows disparities in the distribution of house floor material across the sub-counties - Njoro (17%), Rongai (12.8%), Molo (11.1%), and Subukia (10.8%). Nakuru Town East (1.5%), and Nakuru Town West (3%) and Naivasha (6.2%). Further, the study indicates that a high proportion of dwelling unit floor material was made of cement/concrete floors and ceramic tiles.

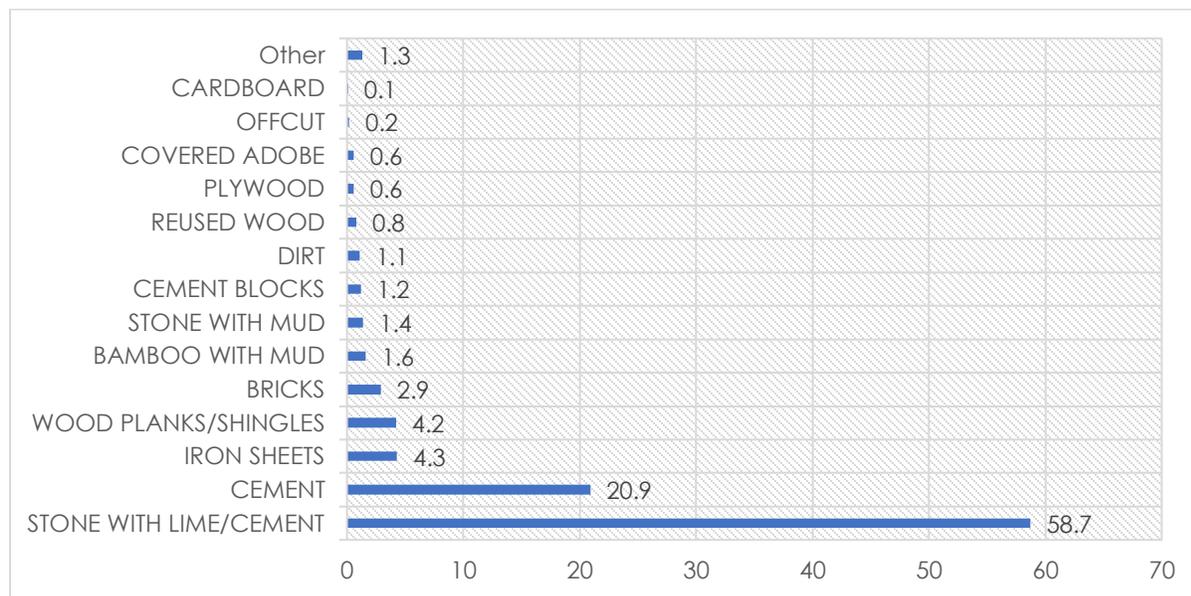Figure 4.25: Percentage distribution of households by predominant material of the floor
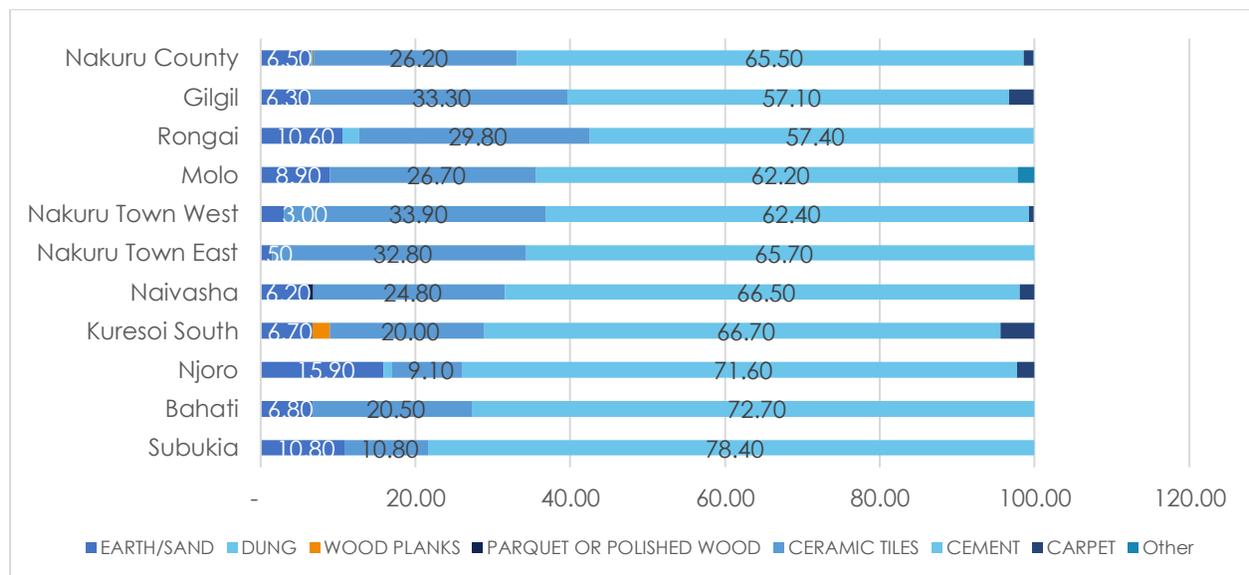
Source: KIPPRA Survey 2024
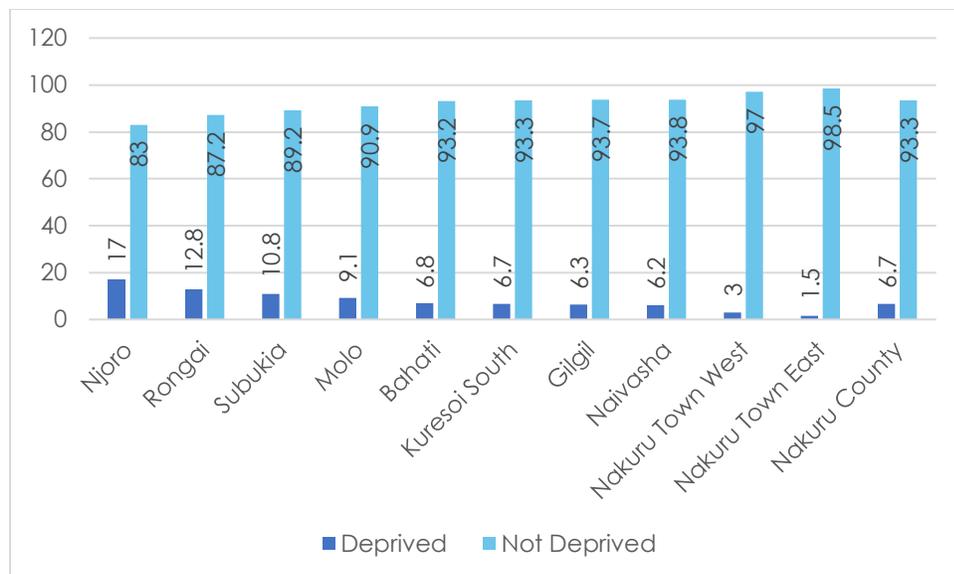
iii) Housing floor material

The KIPPRA survey 2024 revealed that a majority of households in Nakuru County have dwelling units with floors made of finished and durable materials (93%). The predominant floor material in use in Nakuru County is cement which accounts for 65.5 per cent in the county. About 26.2 per cent of the households reported having ceramic tiles, while 1.2 per cent had floors made of carpets. Notably, about 7 per cent of the population reported having floors made of unimproved materials such as earth/sand, wood planks among others. Njoro, Rongai and Molo recorded the highest depreciation levels (see figure 4.26).

Figure 4.26: Predominant Floor material of the main dwelling
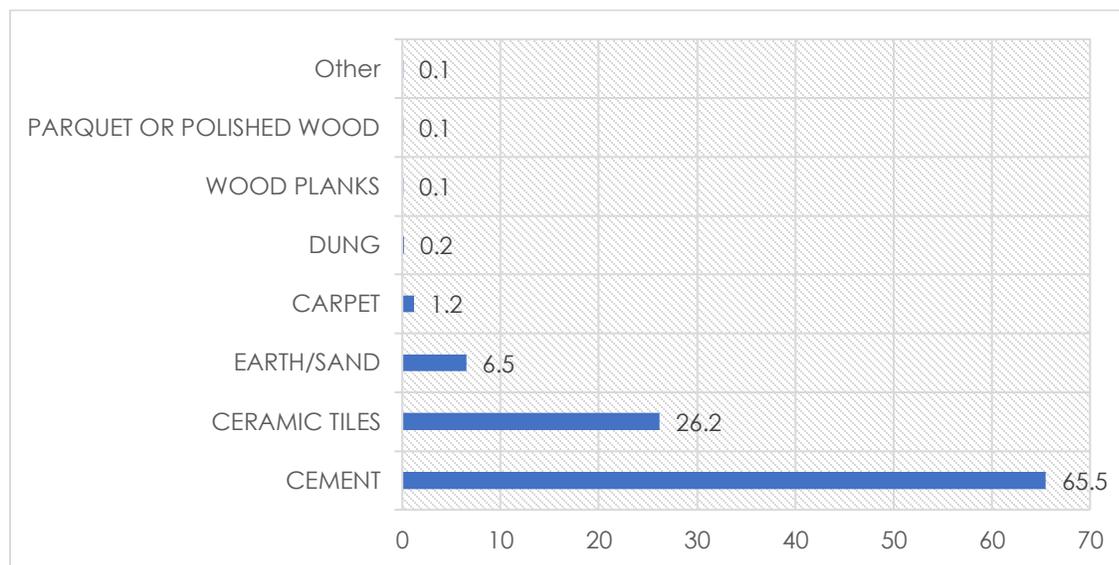
Source: KIPPRA Survey 2024

Figure 4.27: Floor Deprivation levels by subcounty
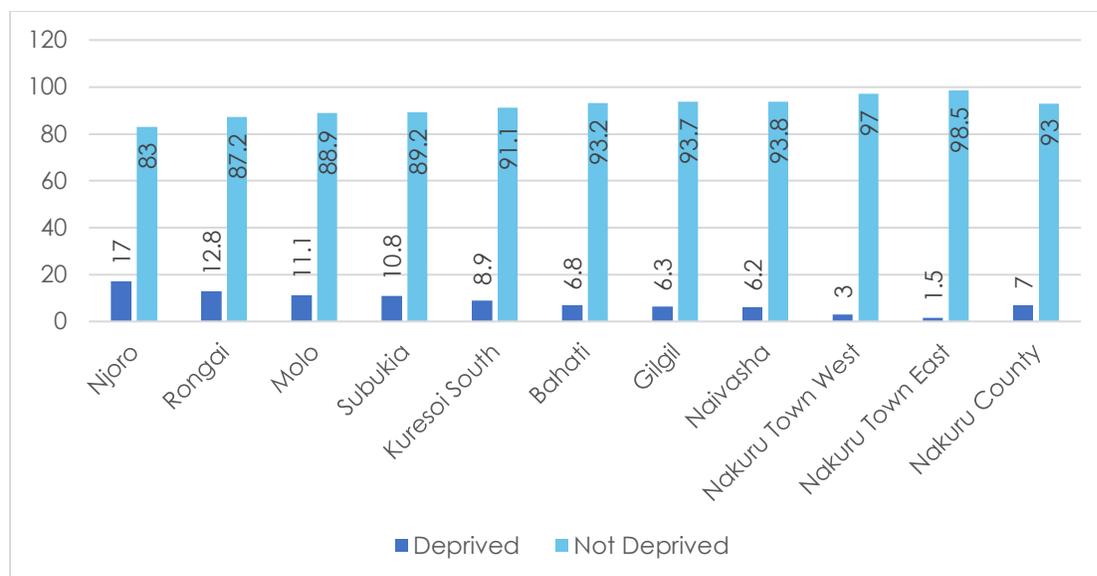
Source: KIPPRA Survey 2024

g) Housing Crowding

Household crowding is a condition where the number of occupants exceeds the capacity of the dwelling space available. It is a key indicator for housing policy as it impacts public health, social equity, and overall quality of life, with overcrowded homes linked to increased disease transmission, mental stress, and poor child development. Addressing crowding through policies that promote affordable housing, sustainable urban planning, and improved infrastructure is essential to ensure equitable access to safe living conditions. Reducing overcrowding also fosters better labour productivity, social stability, and resilience to disasters, while upholding the right to adequate housing.

Household crowding remains high in Nakuru County (70%), with sub counties such as Rongai (85 %), Gilgil (84%), and Bahati (80%) exhibiting high levels of crowding, while slightly lower levels of crowding were recorded for Molo (60%), Nakuru Town East (62%), and Subukia (62%).

Figure 4:28 Households crowding across the sub-counties
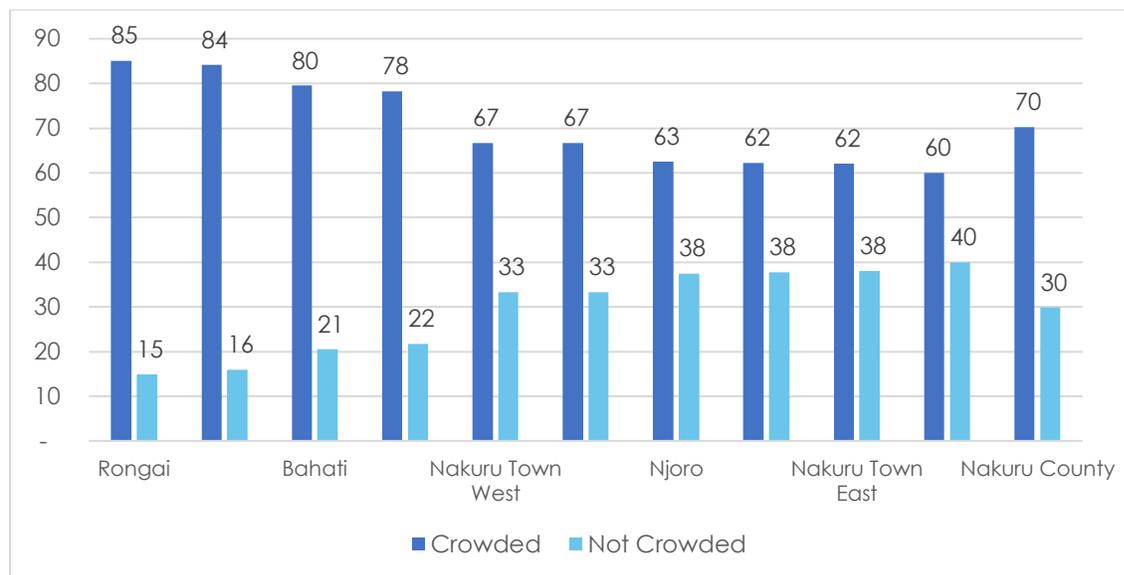
Source: KIPPRA Survey 2024

h) Access to Information Communication Technology

Access to Internet is considered a key basic amenity for the households' welfare. The county had 55.5 per cent of households connected to the Internet (Figure 4.29). More than half of the population in Kuresoi, Nakuru Town West, Gilgil, and Nakuru Town East, and Molo recorded more higher internet usage than the County average, while Subukia, Bahati, and Rongai recorded lower internet usage. This suggests that the areas would be dominated by low-income earners, or the areas are underserved and unserved by telecommunication facilitates.

Figure 4.29: Internet Access by sub county
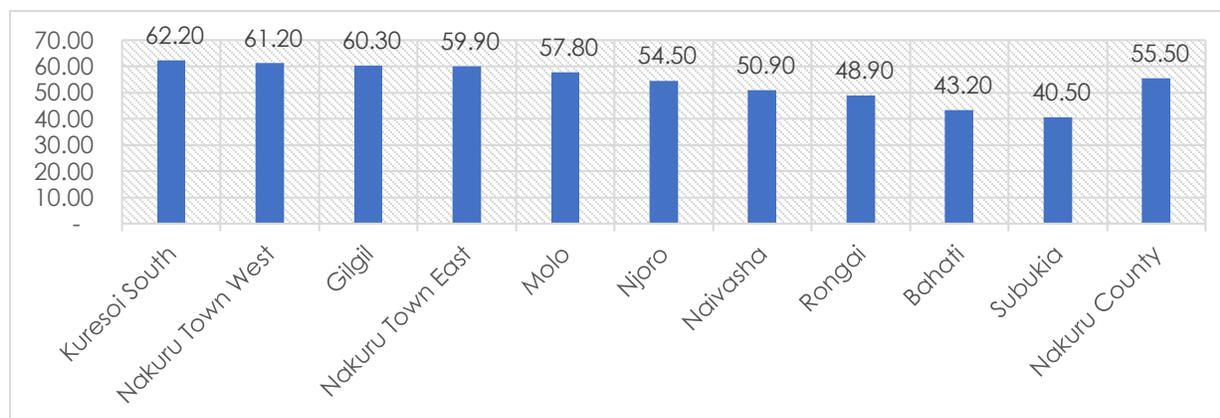
Source: KIPPRA Survey 2024

Figure 4.30: Internet Deprivation levels by sub county
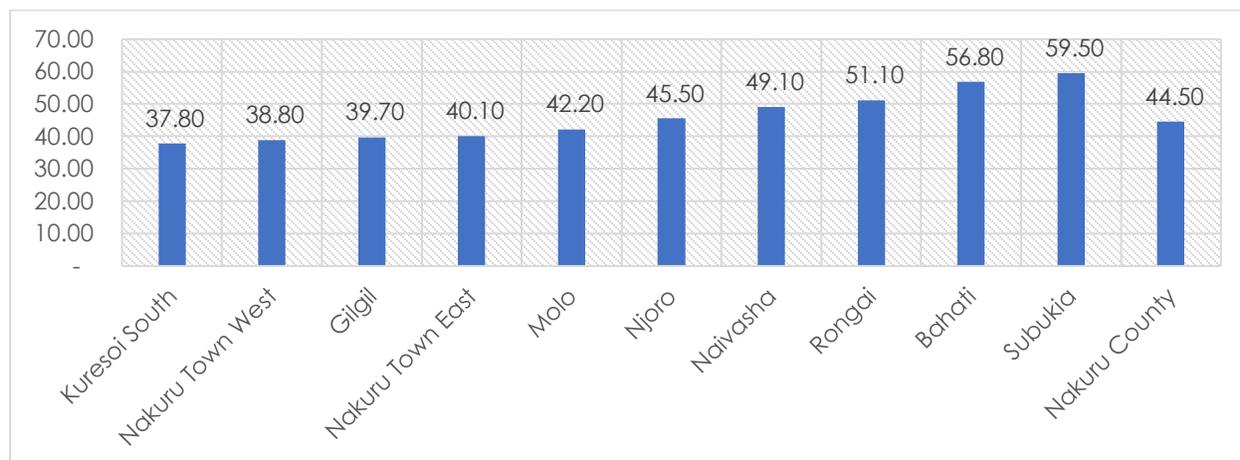
Source: KIPPRA Survey 2024

i) Overall Multidimensional Housing Deprivation Index for Nakuru County

MHDI for Nakuru County showed the intensity of housing deprivation for the ten weighted indicators, namely; cooking energy, lighting energy, improved water source, improved sanitation facilities, access to garbage collection services, improved housing conditions such as roof, wall, and floor, household crowding characteristics and access to internet (see figure 4.30). The weighted housing deprivation index for Nakuru stood at 0.38, implying that about 4 out of 10 households in Nakuru County are multidimensionally deprived of housing. The highest deprivation is recorded in Subukia (0.46), Gilgil (0.44), and Bahati (0.43) (see figure 4.31).

Figure 4.31: Multidimensional Housing Deprivation Index (MHDI) by subcounty
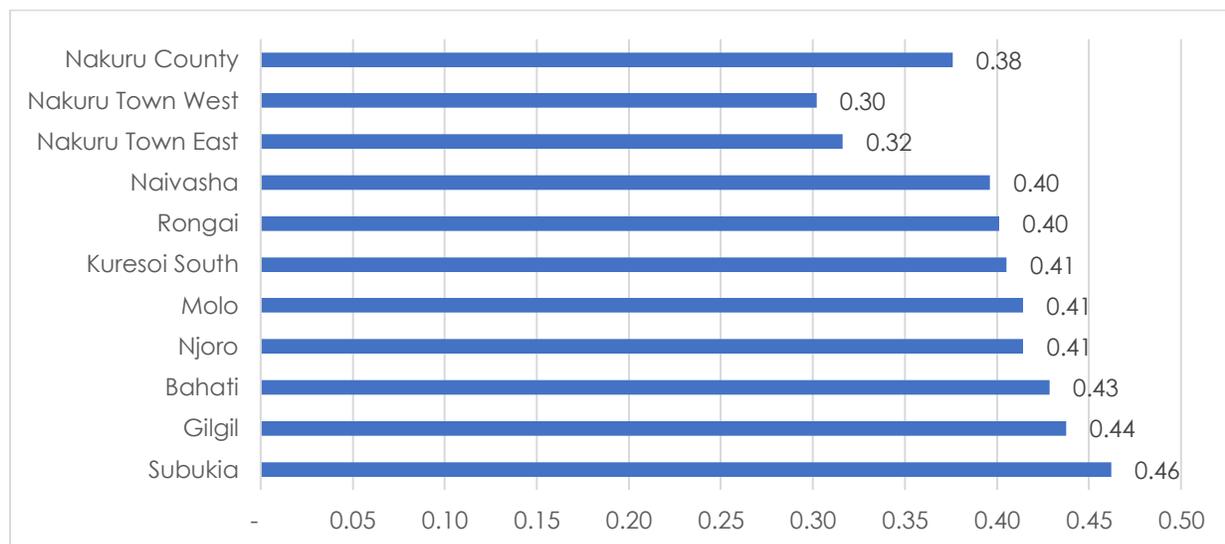
Source: KIPPRA Survey 2024

The highest deprivation was recorded for access to Internet (100%), followed by overcrowding (70%), access to improved sanitation services (55.9%), improved cooking energy (44.6%), and Garbage collection (42.1%). Roof materials (0.6%), Lighting (2.3%), Wall materials (6.7%) and Floor materials (7%) recorded the lowest deprivations.

Figure 4.32: MHDI for Nakuru County
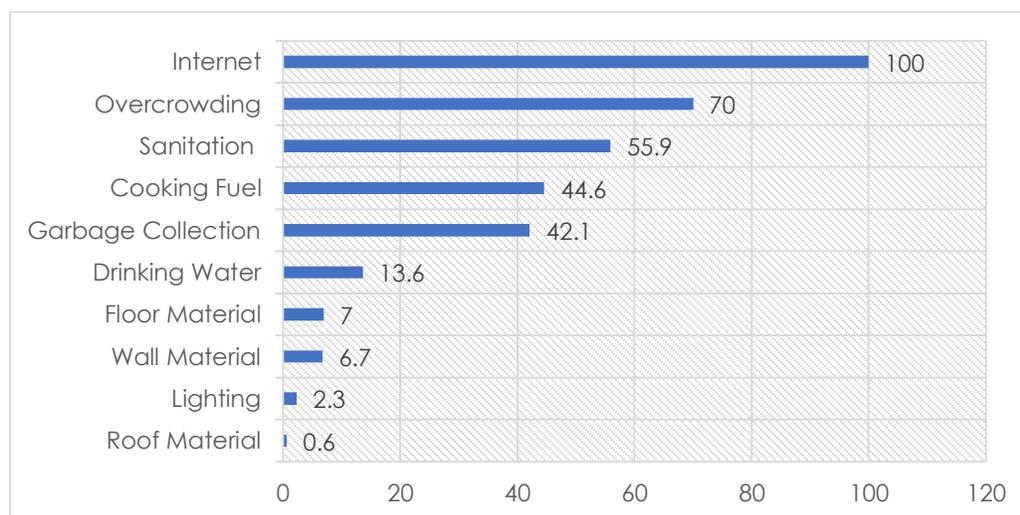
Source: KIPPRA Survey 2024

The breakdown of MHDI by indicators is critical in understanding the depth of the deprivation by providing insights on key indicators driving MHDI, hence inform

specific areas that require policy intervention. The percentage contributions reflect the weights and the censored headcounts. The highest contributor to the MHDI deprivation is access to internet (29.1%), followed by Overcrowding (20.4%) access to improved sanitation services (16.3%), use of clean cooking energy (13%), and access to garbage collection services (13%). In turn, indicators that contributed least to the MHDI include floor material (2%), lighting energy (0.6%), wall materials (2%), and roofing materials (0.1%).

Table 4.2: Contribution of indicators to Multidimensional Housing Deprivation Index

Per cent contribution of indices to overall index	
Internet	0.291
Overcrowding	0.204
Sanitation services	0.163
Cooking fuel	0.130
Garbage collection services	0.123
Water	0.040
Floor Material	0.020
Lighting	0.006
Wall material	0.020
Roofing material	0.001
Multidimensional housing deprivation index	1.000

Source: KIPPRA Survey 2024

4.3   Nakuru County Social housing

This section provides a comprehensive overview of the Nakuru county owned housing which is mainly occupied as social rental housing. This section details the current stock of County-owned houses, including their types and total numbers. It analyses their geographic distribution, revealing patterns of accessibility, and assesses their condition, categorizing them as habitable or inhabitable. Additionally, the maintenance status of these properties is evaluated to determine compliance with safety and health standards. This section therefore provides a clear baseline of Nakuru County's social housing situation, highlighting challenges to inform targeted interventions and strategic planning to improve living conditions and achieve social housing.

a) Housing Stock

The Nakuru County data reveals that the providers of rental housing vary across the sub-counties. The provision of rental housing by the County Government is mainly in Nakuru Town East sub county (90%) followed by Naivasha (8.5%); as illustrated in Figure 4.33.

Figure 4.33: Distribution of County Government Houses
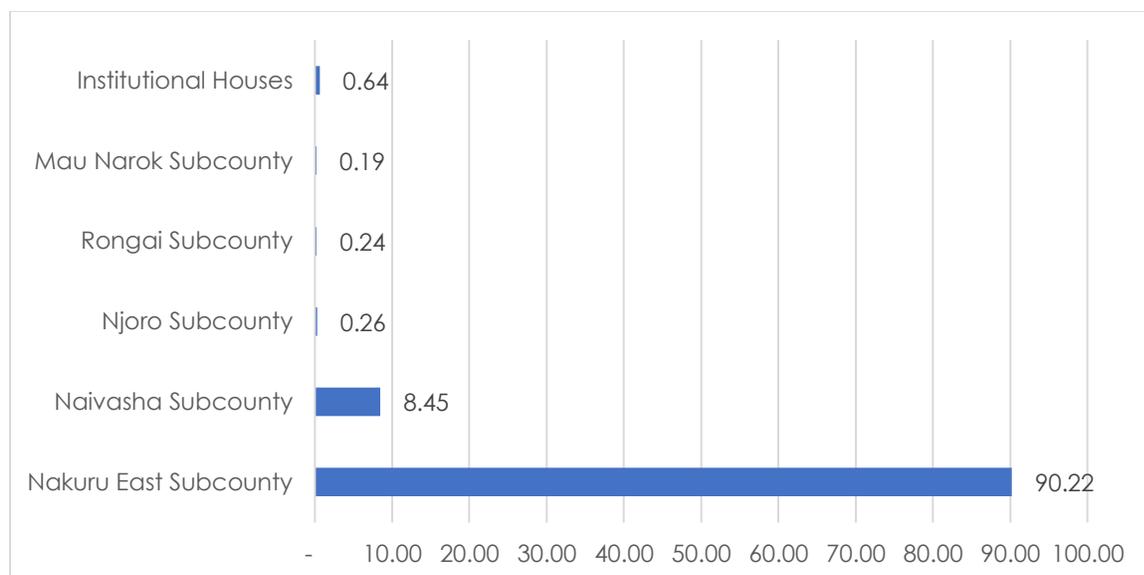
Source: Nakuru County data

However, it is noted that most of the estates owned by the government comprise of old housing stock with dilapidated basic services. This is largely attributed to the fact that the units were built in the 1950s to 1970s, and are occupied by members of the public that transfer occupancy within close family ties. The number of units under various social housing types and monthly rental payments by tenants are presented in Table 4.3. Most of the existing social housing falls under the category of single rooms and one bedroom.

Table 4.3: Number of social housing units and rental payments across various house types

House type		No. of units	Monthly rent range (KShs.)
Single room		4,140	800 – 1,500, but mostly 800
Bed sitter		215	1,500-2,000, but mostly 1500
One bedroom		587	2,000-5,000, but mostly 3500
Two bedroom		112	2,500-6,500, but mostly within the range of 4,500 to 6,500
Other	"Big house"	5	1,200-5,000
	"Small house"	40	1,000-2,000
	Shops	24	4,000-4,200
Other – not classified as above		186	1,500-3,000
Total		5309	

Source: Nakuru County data

Further, it was noted that the County has substantial land available for development, currently hosting the county social housing and totalling about 260.5 acres, as illustrated in Table 4.4. Nakuru East and Naivasha together account for 74.3 per cent of this land (See appendix 2).

Table 4.4: Distribution of Nakuru county land acreage under housing units

Urban Area	Share of county housing units (%)	Acres
Nakuru East	90.8	150.0
Naivasha	8.5	43.5
Bahati	0.0	5.0
Molo	0.0	5.0
Njoro	0.3	42.0
Gilgil	0.0	15.0
Rongai	0.2	0.0
Mau Narok	0.2	0.0
Total	100.0	260.5

Source: Nakuru County data

b) Prospects towards Regeneration Plan for Social Housing in the County

Social housing is essential to cater for the low-income segments of the population. Adoption of a regeneration plan is however crucial towards the provision of decent social housing and smart urban strategies. Several considerations warrant attention in terms of the change of public perceptions and adoption of innovative measures. Developing a masterplan that guides compact planning would enhance efficiencies and promote economic ways of provision of social amenities, including even recreational facilities within the 260.5 acres of land that

is currently hosting the social housing units across the County. This needs to be integrated with attracting investments to supplement the limited resources available from budgetary allocations. The use of Public-Private Partnerships (PPPs) could be one of the solutions, borrowing from the experiences of success stories in the County, such as the Nakuru Bondeni Affordable housing project. Modernization of the rent collection system is also vital. The existing process of depositing money into bank accounts, presenting the deposit slip to the county revenue office for issuance of county receipts and posting into the County Integrated Finance Operations Management System (CIFOMS) is cumbersome and inefficient. The engagement of professional real estate management, including within the staffing structures of the County would also be beneficial. Citizenry engagement and creating an atmosphere of trust among the key stakeholders is essential in undertaking the intended regeneration transformations as it creates the ecosystem for transformation towards provisions of decent social housing in the County.

c) Conditions and servicing of the County Social Housing

The servicing of social housing has the components of making regular maintenance for the wear and tear of the floors, walls and roofing as well as maintenance and improvements of sanitation system and other infrastructure like solid waste disposal and utilities. Most of the housing units are noted to be in deplorable condition. While conventionally it is the landlord's (county government in this case) responsibility to undertake regular servicing of the housing units, resource constraints have hindered servicing or even upgrading/facelift to happen.

There is a confluence of constraints that impede the servicing and maintenance of the social housing units in the County. Key constraints include minimal budgetary allocation for maintenance, with less than KShs. 10 million allocated annually, which is inadequate considering the large number of housing units. Further, the social housing units that were at inception designed for one person occupancy (the civil service system was designed for one person, only the worker, not his family who would be upcountry) are now noted to be occupied by average five of persons due to rural-urban migration and shortage of affordable houses. This further severely constrains the capacity of existing infrastructure such as sewer systems, solid waste disposal and other sanitation infrastructure. Funding is tied to budget cycles, often resulting in less-than-optimal allocations due to the negotiation nature of the process from competing developmental priorities and needs. Besides the low budgetary allocations, there are a number of issues surrounding operation and serving of the County's social housing units, including inefficient revenue administration and collection system, low rental revenue

collections due to the subsidized design of social housing, gaps in professionalizing management of the properties, politicization of management of the properties and accumulation of debt arrears standing at KShs. 693.3 million as of August 2024 – some dating to the period before devolution at the time of municipal council.

Moreover, some institutional houses (such as those operating under the care of schools such as Bondeni Primary Estate) (see appendix 2) have ceased to generate revenue for various reasons. Some houses have been converted to other uses over time but were originally residential units with some tenants erecting additional structures (extensions). Further, some housing units are under the management of the National Housing Corporation and quasi-government institutions like Laptrust and Lapfund due to challenges of pending debt issues such as remission of staff pensions, partly dating to the period before devolution. Additionally, the framework for managing the social housing units in the county remains unclear – considering limited budgetary allocations for maintenance. It is noted that the reforms to facelift the houses are expected to go through the public participation process, however, the current occupants are unwilling to support this effort due to the fear of being displaced. Further, the capacity of the existing infrastructure and facilities within the estates are overstretched due to constrained funding for expansion and maintenance. Notably, in some estates there is an average of 48 housing units sharing facilities such as bathrooms and toilets.

The housing density also presents challenges, particularly when homes are constructed with minimal spacing. Many neighbourhood settlement houses are built so close to each other, such that critical infrastructure, such as fire engines, struggle to access homes in emergencies. This tight spacing, while maximizing land use, creates safety risks and hampers effective service delivery. Moving forward, it's essential that the county enforces spacing regulations to improve accessibility, reduce overcrowding, and ensure safer neighbourhoods.

d) Social Housing and Rent arrears

The County's expected monthly rent collections stand at KShs. 7,223,475. The units are largely social housing units whose rent ranges from KShs. 800 to KShs. 6,500 a month for units ranging from single rooms to two-bedroom housing units. The rent collection faces constraints with accumulated arrears standing at KShs. 693,278,558 (Table 4.5) which were, however, waived by the Nakuru County government in August 2024. This is largely attributed to various reasons such as the low economic status of the residents, inefficient rent payment systems, and political reasons. The county government has made attempts to professionalize the management of its estate stock by recruiting qualified staff to manage the

properties. However, such initiatives are not popular and often face resistance from estate residents who perceive the measures as eviction/displacement attempts. Notices have also been issued to the residents to the same effect, but this has not seen much success either. The county government has previously provided waivers to provide immediate economic relief to tenants, and prevent the evictions of vulnerable occupants, with the aim of a fresh start for compliance in rent payments. The piling rent arrears reduce government revenue and increase fiscal pressures. This has resulted in the underfunding of the housing maintenance budgets resulting in the deterioration of the housing stocks quality. The consequence is increased long-term maintenance costs due to the delayed servicing and repairs and the need for more extensive renovations.

Disputes over allocations of County government housing units are common due to the high demand for affordable housing and the limited supply of such units. These disputes arise from various issues, including perceived unfairness in house allocation, corruption, legal ambiguities, and socio-political dynamics of the county.

Table 4.5: Social housing rent arrears across sub counties

Estate	Standard Rent (KShs. per annum)	Rent in Arrears KShs.
Nakuru East	6,553,300	622,469,894
Naivasha	576,075	63,067,164
Njoro	6,000	1,645,500
Rongai	--	--
Mau Narok	--	--
Institutional Houses	82,000	5,728,500
Total	7,223,475	693,278,558

Source: Authors' calculations based on County Government of Nakuru data

4.4   Conclusion and recommendations

In conclusion, this section has provided an analysis of the household characteristics, housing status, and levels of housing deprivation across urban centres in Nakuru County. The average household size is 4.5 persons, slightly higher than the national average, with most households falling into the medium-sized category (3-4 members). Housing patterns reflect a mix of small and large family units, with smaller households driving demand for compact housing. The county has a youthful population, with most residents aged between 15-64 years. Additionally, over 81 per cent of urban households earn less than Khs 20,000 per month, highlighting the need for affordable housing programs, particularly for

low-income earners. Such housing needs are more likely met by rental as a first stepping stone to rent to own or mortgage or other homeownership schemes.

The KIPPRA survey 2024 reveals that most households live in dwellings with durable roofs, walls, and floors. Iron sheets and cement are the dominant materials, though a small percentage still reside in low-quality structures. The housing market is dominated by flats and apartments, with most residents renting their homes. Homeownership is limited due to high costs of construction as well as purchasing housing. Due to these costs, there is a high prevalence of informal settlement with low rental prices. Overcrowding is common, with a significant proportion of households living in single or two-roomed units. The survey suggests that affordable housing programs should focus on improving rental conditions, expanding multi-room housing to address overcrowding and high demand, and increasing opportunities for homeownership for those households who have the means to pay for a house.

Access to basic infrastructure varies across Nakuru County, highlighting significant challenges and variations among sub counties. While areas like Nakuru Town East and Nakuru Town West show relatively high access to clean cooking energy, lighting, and improved sanitation, regions such as Bahati, Rongai, and Subukia face substantial deprivation. The uneven distribution of resources, such as clean cooking fuels, electricity, and sanitation facilities, underscores the need for targeted interventions and policy adjustments. Addressing these disparities requires a focused approach to improve infrastructure access, particularly in peri-urban and rural areas where deprivation is more pronounced.

To achieve equitable development and enhance the quality of life for all residents, it is crucial to implement comprehensive strategies that address the specific needs of each sub county. Investments in infrastructure, such as upgrading water and sanitation systems, expanding access to clean energy sources, and improving housing conditions, are essential. Additionally, fostering public-private partnerships and community engagement can play a pivotal role in addressing infrastructure gaps and promoting sustainable development across Nakuru County.

Access to financing remains a challenge for young people particularly those unable to secure loans for deposits on homes under the Affordable Housing Program (AHP). Many youths lack the necessary collateral to access credit, and without steady, substantial incomes or established credit histories, financial institutions are reluctant to provide housing loans. This challenge limits the participation of young people in affordable housing schemes and hampers their ability to build equity through home ownership. To address the financing

challenge young people, face in accessing affordable housing the county could collaborate with financial institutions to develop collateral-free loan programs tailored for young people. By offering guarantees or subsidizing interest rates, these programs could enable youth to access housing loans without traditional collateral, making it easier for them to meet deposit requirements and encouraging and supporting youth to join or establish savings and credit cooperatives could help them build credit histories and pool resources for deposits. The county could facilitate youth-specific housing cooperatives that focus on affordable housing access, including providing incentives for regular savings and investments.

Cooperatives and self-help groups in Nakuru could also play a vital role in facilitating home ownership for their members. Through pooled resources and revolving funds, especially within women's groups, members can access low-interest loans or grants for housing deposits or incremental home construction. These collective saving schemes also provide a viable financial platform for lower-income individuals who may not qualify for traditional banking loans, significantly contributing to the local housing market's accessibility.

The Multidimensional Housing Deprivation Index (MHDI) for Nakuru County reveals a substantial proportion of households facing significant deprivation across various housing dimensions. The overall MHDI of 0.38 indicates that nearly 40 per cent of households in Nakuru County are multidimensionally deprived. The highest levels of deprivation are observed in Subukia, Gilgil, and Bahati, where the MHDI scores are notably high. Access to internet services is the most significant contributor to deprivation, reflecting a critical gap in digital connectivity. Affordable housing developments should prioritize internet connectivity to support residents' access to digital resources, especially in underserved areas. Reliable internet can improve education, employment, and overall quality of life. For deprived neighbourhoods, county-driven initiatives to integrate affordable internet options would provide a substantial boost in bridging the digital divide and fostering economic opportunities. Improved sanitation services and clean cooking energy are also major contributors, highlighting areas where infrastructure development is urgently needed.

Further, it is noted that land tenure disputes and unclear ownership issues are key constraints in housing development in the county. In addition, there are instances where demolitions and resettlement have been carried out because of land ownership issues. This provides the basis why Nakuru will need a housing policy that provides mechanisms for resolving these disputes and clarifying land ownership, facilitating smoother development processes.

Improving housing quality is also a key concern in the County, particularly with social housing. Addressing this policy and legal gap will be instrumental in securing adequate resources, building good culture and implementing building management information system to enhance the county's efforts towards maintaining quality buildings. Inadequate historical data on maintenance works carried out in a building or estate leads to poor maintenance planning, feedback and budgeting. An automated system will facilitate keeping and maintaining inventory of buildings which is prerequisite to planning, budgeting and knowing the value of the stock for maintenance purposes.

By developing a housing policy framework, Nakuru County will establish set standards for construction safety, environmental sustainability, and accessibility, as well as establish maintenance funds. At the moment, the County Government is not able to respond to timely requests for maintenance made by the tenants and this may compromise their safety and living conditions. Further, the County would be able to provide clear guidelines on incorporating sustainability principles, such as green building practices and energy-efficient designs and creating environmentally friendly and resilient buildings. Modern housing should incorporate sustainable features such as rooftop solar panels, water harvesting systems, and efficient waste management. By using solar power, homes can reduce reliance on traditional energy sources and lower electricity costs. Integrating water harvesting will help to conserve local water resources, while recycling initiatives will minimize landfill waste. It's recommended that environmental impact assessments become mandatory at the planning stage of housing developments to guide these sustainable choices.

Improving social housing will benefit residents and the county's economy. By enhancing existing housing units, more residents will be incentivized to rent, thereby increasing county revenue. Although recent rent waivers have eased burdens for tenants, the approach is not financially sustainable long-term. A balanced strategy that supports tenants while generating consistent income would ensure the stability and growth of social housing programs.

5. Analysis of costs of housing in Nakuru county

5.1   Introduction

The cost dynamics are important in evaluating affordability and adequacy of housing. The cost of buying or constructing a house and that of buying land varies across the county, majorly due to the location and availability of social amenities

like schools, hospitals, and security as well as basic infrastructure including sanitation, electricity and water. The cost of building materials is also key in determining the type of house to construct. There are also costs associated with compliance with building codes, laws and regulations, and approvals sought by homeowners and/or private developers before a project commences. Other costs include repair and maintenance costs, house extensions and other infrastructural installations. Different financiers including banks, microfinances, and SACCOs provide financing for housing but households' own savings or support from family and friends is also significant.

5.2   Costs of constructing housing

The construction costs include the cost of land, approvals, material, transport, and labour. This study notes that the modernized houses across Nakuru County are predominantly made of stone and cement walls, with concrete floors and corrugated iron sheets as roof material. The cost of materials for constructing a house depends on their availability in the area, the distance from the source of materials to construction site since the cost of materials is inclusive of transportation costs, as well as quality of the material, the brand reputation of the manufacturing company, the number of suppliers in the area, inflation, and government regulations, including taxes, and duties (KIPPRA Survey, 2024).

The KIPPRA Survey 2024 shows that the average construction cost of a house is KShs. 977,260 for a bungalow house in the urban areas with an average of two rooms, where higher costs are attributed to the type of roofing (use of concrete compared to use of iron sheets) and type of finishing (moulding designs and materials) among other unforeseen expenditures during construction such as the replacement of broken items. Cumulatively, after adding the cost of land and that of hard construction, the cost per square metre of a two-bedroom house (with wet core) is approximately KShs. 20,000 (AFD & State Department for Housing and Urban Development).

a) Cost of land

The cost of land varies depending on the geographical area and topography, proximity to social amenities (e.g. schools, hospitals), availability of essential utilities (water, electricity, sewer system), infrastructure such as roads, zoning regulations (residential, commercial, and industrial), social factors such as security, and the government policies on land reforms and environmental regulations. Land cost is important as it accounts for about 30 per cent of the

overall housing development and/or purchase. The demand for land in the County has increased due to urbanization and population growth, infrastructure development, and the economic growth speculations following the change of status of Nakuru town to a city. Consequently, the demand for land has prompted an increase in land prices across the County. The average cost of 1 acre (approx. 0.404686 ha) in low-income areas, such as Kuresoi South, ranges between KShs. 1.5 to 3.0 million, whereas in middle-income areas, such as Naivasha Municipality, it ranges from KShs. 4.0 to 7.0 million. The areas zoned as either commercial and/or industrial, such as Nakuru Town East, on average, an acre is approximately KShs. 50 million. However, the real estate developers/realtors divide an acre of land into parcels in the commercial areas, starting from 40 x 80 square feet to a quarter acre selling approximately KShs. 16 million per plot (KIPPRA Survey, 2024). There is, however, inadequate suitable land for housing development, whereby the high demand for this scarce resource, especially in prime areas, has caused prices to escalate, hence stifling developers to supply housing at affordable costs. There are also legal and administrative constraints to land ownership and acquisition due to brokerage and undue processes in land search and issuance of title deeds due to bureaucracy and sometimes corruption that result in litigation. The household landownership pattern is shown in Table 5.1.

Table 5.1 Household ownership of land

	House ownership (alone or jointly)	Land ownership	Agricultural land	Non-agricultural land ownership
Men	21.3	18.1	14.3	6.1
Women	27.8	17.0	13.5	6.0

Source: KNBS 2022

The study reveals that the house ownership for women is relatively higher than that of men as women have been found to embrace partnerships, including self-help groups, in owning properties. Land ownership is relatively the same for both men and women due to the shared responsibility in a household by couples.

b) Construction approval costs

Construction approvals ensure that developers/contractors adhere to building regulations and observe safety and environmental standards. The Nakuru Housing Survey, 2024 shows that 63.6 per cent of those that own their main dwelling unit did not seek government approvals when building. This is attributed to the high costs of approvals as several government agencies are involved and the complexity and bureaucracy of the processes. However, others indicated not being aware of the required approvals while others deemed it unnecessary to

acquire them, which implies low enforcement on the part of the authorities concerned. The mandatory construction approval agencies are County Governments, National Environment Management Authority (NEMA), and National Construction Authority (NCA). Among the documents required to secure house building approval from the county government include: architectural and structural drawings, copy of land ownership, land rates clearance certificate (where applicable), land search document, and survey map. Further, an environmental impact assessment license is obtained from NEMA, and finally a National Construction Authority (NCA) project registration after presentation of practicing certificates and full compliance. The average cost for construction approvals for a one-bedroom house is approximately KShs. 70,000, which includes permits and valuation costs, and excludes the cost of hard construction (i.e. setting up the building) and land. The time taken to obtain the approval varies depending on the availability of required documents, which can be from one week to several months, but estimates the average time to 10 days when all the necessary documents are available. The lack of proper approvals and documentation of land utilization and housing development has seen several disputes arise, especially due to improper and illegal sewer connections or the lack of it, land degradation, and collapsing of buildings, thereby necessitating legal actions including demolitions.

c) Transport and Labour Costs

Transport costs in housing construction are significant as they encompass all the expenses associated with transportation of materials, finished products, and labour. An increase in the transportation costs results in an increase in the overall housing construction costs. This study reveals that labour cost is a key component in housing construction, where the minimum cost for unskilled labour is KShs. 600, and KShs. 3,000 for skilled labour per day, excluding the professional fees surcharged on consultations. The low cost of skilled labour is attributed to lack of proper certifications of acquired skills and the preference of cheap labour when developing the housing (KIPPRA Survey, 2024).

5.3   Costs of purchasing housing

The cost of buying a house depends various factors that include the proximity of a house to social amenities (schools, hospitals, etc.), accessibility (e.g. transportation), size of house (usually measured in square footage), number of bedrooms and added features such as swimming pools, architectural designs, age and condition of the house, and prevailing market conditions related to aspects like cost of materials, and labour. Further, the classification of the location

into low, middle, and high-income areas has implications on the price of a house. Additionally, the high cost of infrastructure development is passed onto the prices of housing by developers hence making the houses unaffordable. Limited access to roads, water supply, proper sanitation further renders many areas to remain inaccessible, hence disincentivizing home ownership in such areas or even for investors committing funds to develop houses in such areas (KIPPRA Survey, 2024). The type of ownership of the main dwelling is shown in Table 5.2 as derived from various reports and surveys. According to the reports, over 70 per cent of the urban dwellers are renting the houses they live in while less than 30 per cent own the houses. Conversely, in rural areas, over 70 per cent own the houses they live in while less than 30 per cent live in rented houses. The high rental ratio in urban areas, versus high ownership rate in rural areas, implies that housing affordability in the urban areas is very low. This can be attributed to the high costs of land and other challenges like approvals required in urban areas.

In the AHP, through a PPP, the average cost of buying a typical modern one-bedroom house in Bondeni area of the County is KShs. 1,550,000. The cost of buying a 2-bedroom house in the same area is KShs. 3,250,000 with a similar type going for KShs. 5,550,000 in Milimani area of the County. This implies that, as one moves closer to the city or relatively higher income areas, the prices for houses increase. The PPP agreement for the Bondeni AHP required the national government to provide land while the private developers provide design, materials and manpower, and the county government to offer documentation and approvals. The agreement between the government and the private developer was in the ratio 20:80, where the government sold 20 per cent of the units as 80 per cent went to the private developer. However, the KIPPRA Survey 2024 showed that majority of the respondents are not conversant with the policies and regulations governing AHP, as provided for in the Affordable Housing Act, 2024, and other income tax Acts, such as tax relief (79.4%) and tax deductibility on interest paid for loans (85.8%).

5.4   Costs of housing maintenance

Regular maintenance of houses is important for structural integrity, health and safety. The KIPPRA Survey (2024) showed that several homeowners did maintenance and repairs in their homes which included roof replacement, demolition and alterations of wall, extension of a house, ceiling alterations, floor finishes, and other minor repairs. The costs depend on the age, size, and condition of the house. The published budget estimates for the FY2022/2023 indicated that 26.5 per cent went to operations and maintenance of all county establishments, with only 1.03 per cent of this going into Land, Physical Planning and Housing departments. However, several units under the social housing scheme are in

deplorable state, indicating years of lack of proper repair and maintenance. This is attributed to low rent collections, with several waivers issued on rent over the years, hence very little to no allocations by the government for their repair and maintenance.

5.5   Financing options for housing in the county

Financing options provide a means to build, own or rent a house. The KIPPRA Survey 2024 showed that 69.7 per cent of respondents who own their current dwelling units used cash savings to construct them, 20.7 per cent used loan/mortgage, while the remaining 9.6 per cent used means which include inheritance and as a gift. Thus, the major options available for housing financing are cash savings and loan/mortgages. A report by the Kenya Mortgage Refinance Company (KMRC) in 2022 showed that only 11.0 per cent of the Kenyans can afford mortgage while 89.0 per cent cannot. This is attributed to the low- and irregular -income levels of most Kenyans. KMRC-backed home loans are usually priced at a single digit (9.5%), through various lenders such as banks, microfinance and SACCOs for workers. The prospective homeowners targeted by KMRC are those that want to purchase a finished house, construct a house on own land or buy land to construct a house. That is, for a KShs. 5 million property, the loanee pays KShs. 43,700 monthly at 9.5 percent interest for 25 years. A report by the Centre for Affordable Housing Finance Africa showed that the minimum monthly income to allow an individual access mortgage is KShs. 50,000.

The KIPPRA Survey 2024 revealed that 82.7 per cent of the respondents earned below KShs. 20,000 (Figure 5.1), which is much lower than the required minimum monthly pay to qualify for a mortgage. Even upon qualifying for a mortgage, the interest rates charged on mortgages are high – with interest rates averaging 14.3 per cent in 2023, up from 12.3 per cent in 2022 (KMRC, 2024)[1], hence further dissuading potential mortgagors. Further, the inadequacies of construction finance, barriers faced in obtaining approvals, and land registry bureaucracies delay the uptake of affordable housing units. The KShs. 250 billion funding stipulated in the National Housing Corporation Strategic Plan 2023-2027 is geared towards increasing the number of mortgages from 30,000 to 1 million to enable low-cost mortgages of KShs. 10,000 and below and further ensure reduced cost of construction and improved access to affordable housing finance. Further, the Affordable Housing Act, 2024, section 8, provides for the establishment of Affordable Housing Fund as well as section 10, subsection 2(b) provides for low interest loans or low monthly payment home loans for acquisition of housing units under the affordable housing schemes. The Boma Yangu initiative connects

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[1] Kenya Mortgage Refinancing Company – KMRC (2024). State of banking sector mortgage market in Kenya. Nairobi: KMRC.

individuals with the AHP where one can save 10 per cent of the total value of the preferred housing unit to qualify for house allocation. Further, the initiative allows organized groups to acquire the housing units on behalf of their members upon a similar deposit of 10 per cent of the cost of the unit.

Figure 5.1 Household income levels
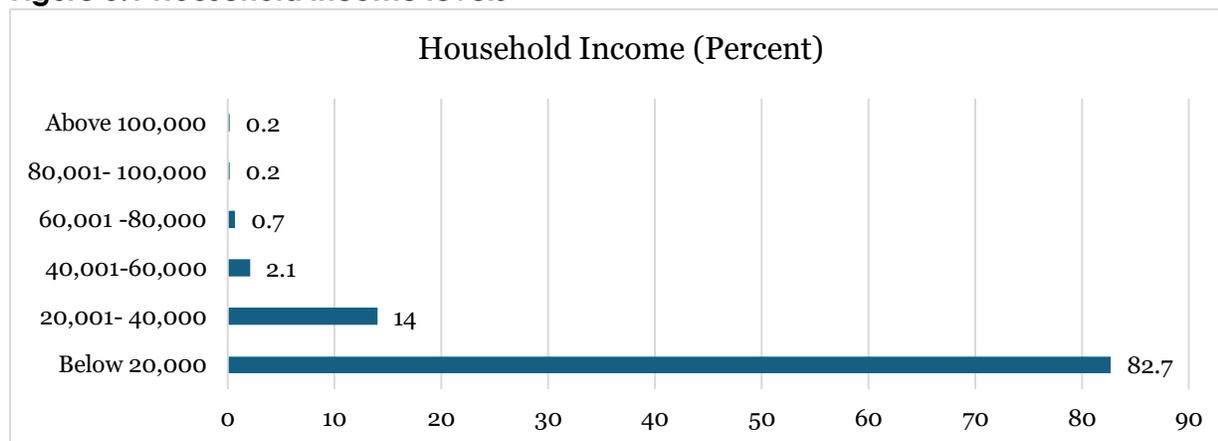
Source: KIPPRA Survey 2024

KIPPRA Survey 2024 indicates that out of over 70 per cent of the respondents who rent their dwelling, 60.4 per cent desire to build their own dwelling units while 23 per cent prefer to buy an already built house. Further, the amounts they are willing to spend on building or purchasing an adequate house vary substantially across the sub counties, with the average for the County being KShs. 2,815,262, as shown in table 5.2.

Table 5.2: Average amount willing to spend to build/purchase a dwelling

Sub county/constituency	Sample who rent or lease the dwelling (n=634)	Average amount willing to spend to build/purchase a dwelling for those renting or leasing the dwelling
Naivasha	106	2,221,038
Gilgil	36	3,250,028
Nakuru Town West	154	3,750,513
Nakuru Town East	122	3,964,230
Rongai	38	2,018,421
Bahati	35	1,637,143
Subukia	25	1,744,000
Njoro	58	1,479,310
Molo	30	2,110,000
Kuresoi South	30	1,484,333

Nakuru County	634	2,815,262

Source: KIPPA Survey 2024

KIPPRA Survey 2024 identified financial constraints as major drawback to owning or living in an adequate dwelling unit. The survey notes that a potential house owner requires a huge amount of capital to buy land and build a home and/or buy a home. Further, high interest rates are a key barrier to taking loans. Again, some loan amounts are subject to individual monthly income, which financiers or lenders use to determine individual's credit worthiness for capacity to repay a loan on time. The KIPPRA Survey 2024, showed that 82.7 per cent of the respondents in the urban areas indicated to earn below KShs. 20,000. This implies that a greater percentage of the population in Nakuru County is operating under constrained budget hence restrained from qualifying for loan adequate to buy/build a house and/or buy land. The economic fluctuations, the high inflation rate, and general economic downturns have greatly impacted demand for adequate housing thus making it a challenge for individuals to secure housing finance.

KIPPRA Survey 2024 reveals that 82.7 per cent of the households surveyed have monthly income levels from their primary job of below KShs. 20,000. Further, 14.0 per cent of the respondents reported earning between KShs. 20,000 and KShs. 40,000 from their primary job. About 3.3 per cent of the respondents indicated earning above KShs. 40,000 from their primary job. The earnings can be attributed to most of the respondents indicating different irregular jobs, where some go for days without a job in a week – the majority working less than 30 hours in the past 7 days prior to the day of the KIPPRA's survey. The study reveals that most of the population are low-income earners, implying that housing affordability is low and therefore low savings. Securing a loan requires proof of pay slips making the low-income earners have low credit worthiness. KIPPRA survey reveals that majority (53.6%) reported to be self-employed, followed by unemployed (28.8%), employed (government or private sector) at 19.6 per cent, and 'other' at 2.0 per cent. Employment within the informal sector, majorly in the form of self-employment, is prone to various constraints like income continuity and social protection, all seen to be risk factors when accessing financing for housing. Further, in a population where the largest percentage is the youth, the high level of unemployment and lack of collateral for loans implies that they cannot be able to acquire the affordable housing units and are also not in a position to buy or develop housing. This, therefore, puts constraints on the amounts one is willing to spend on the construction/purchasing of housing vis-à-vis how much one is actually able to afford to spend on the same.

5.6   Incentives available for housing development and purchase

To enhance affordability in housing, the government offers incentives to both house builders and buyers as provided by the National Housing Corporation (NHC), Income Tax Act, and the Affordable Housing Act, 2024.

5.6.1   Incentives to builders

The National Housing Corporation Strategic Plan 2023-2027 highlights some of the means to incentivize builders and buyers for affordable housing through private sector financing by offering land and bulk infrastructure. Further, the plan indicates lowering input costs for building materials and tax breaks such as zero-rating stamp duty on first time home buyers as a means towards enhancing affordability, and therefore home ownership. Several incentives are stipulated in the affordable housing scheme to developers which will include: Miscellaneous Fees and Levies Act 2016 Section 7(2A) (c) provides for reduction of Import Declaration Fee (IDF) from the standard rate of 3.5 per cent to 1.5 per cent on the custom value of goods imported under the affordable housing scheme. The Railway Development Levy (RDL) is at 1.5 per cent for affordable housing imports, unlike the other imports at 2.0 per cent. The Income Tax Act, CAP 470 also provides for a reduction to 15.0 per cent on corporation tax for a company constructing at least 100 residential units in a financial year, a VAT exemption on materials to be used exclusively for the construction of affordable houses, but upon approval by the cabinet secretary responsible for housing, yet to be operationalized. Further, the government is offering to provide land for housing development and develop infrastructure which includes road, power, water and sewer connections.

5.6.2   Incentives for buyers

The government has put in place various incentives for house buyers. For instance, the State Department of Housing and Urban Development offers stamp duty exemption at 4.0 per cent in urban areas and 2.0 per cent in rural areas for first time buyers of houses under an affordable housing scheme. Further, the Affordable Housing Act, 2024, provides for 15 per cent tax relief on contributions towards affordable housing scheme levy which is capped at KShs. 108,000 per annum (KShs. 9,000 per month). Also, there is tax deductibility on interest paid on loans used to purchase a house under the affordable housing scheme up to a maximum of KShs. 300,000. However, these incentives, according to the State Department of Housing and Urban Development, are in the process of being operationalized.

5.7 County Budget (Allocations and Expenditure) on Housing over the years

This section provides budgetary allocations and expenditures to housing related departments. The development and maintenance of houses received much smaller allocations compared to other areas like urban development.

a) Sector allocations by programme (KShs. Millions)

Nakuru County government, over the years, has invested in housing development programmes in a bid to provide adequate housing, develop urban areas and the city. Nakuru gained city status on 1st December 2021. The sectoral allocations towards, rural and urban development sector was 10 per cent of the county budget allocations of FY2022/2023. The allocations towards urban development are projected to increase following the rapid increase in rural-urban migration, with UN-Habitat projecting half the Kenyan population will be living in urban areas by 2030. The trends in budgetary allocations and actual expenditures for housing sector related are shown in Figure 5.2a and Figure 5.2b, respectively. The allocations towards Land Use, Physical Planning, Housing and Urban Development for the financial years 2022/2023 and 2023/2024 are 3.3 and 3.8 per cent of the total county allocations, respectively.

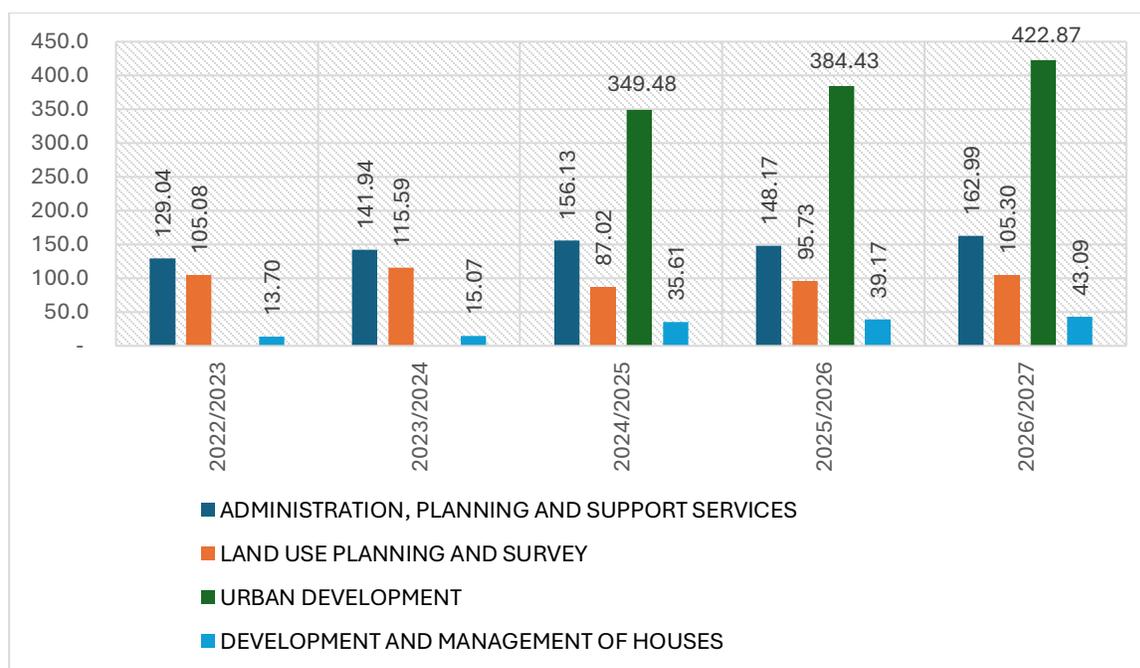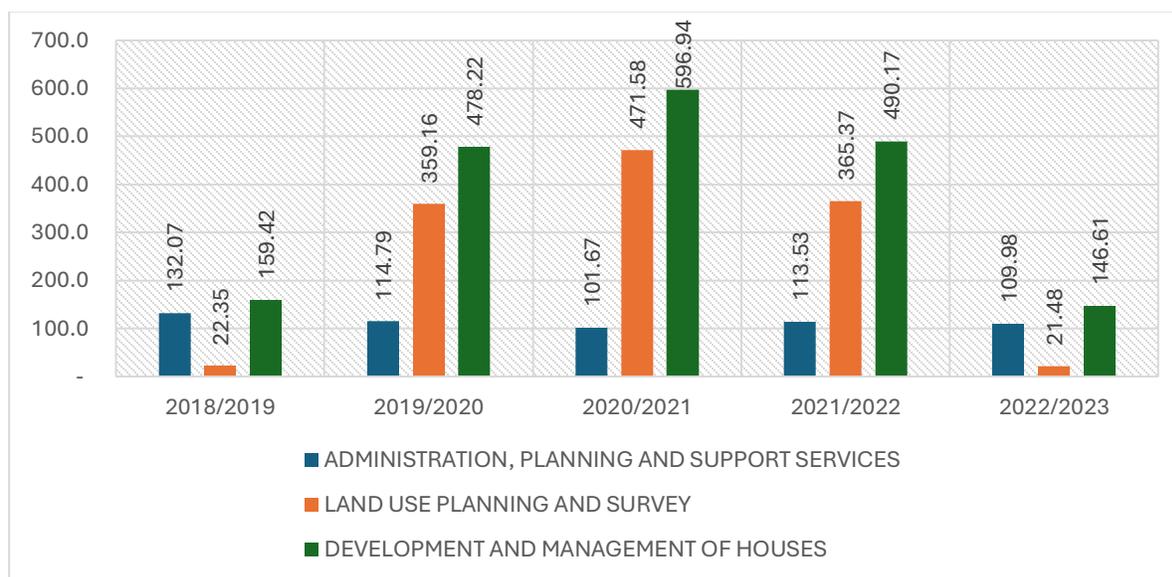**Figure 5.2a** Housing sector allocations (KShs. millions)

Figure 5.2b Housing sector actual expenditures (KShs. millions)

Source: Nakuru County Government reports (CIDPs)

A comparative analysis of the budget allocation and actual expenditures on land use planning and survey for the financial year 2022/2023 shows that very little was utilized compared to the allocation. Allocations towards land use planning and survey are essential in enhancing land registration and digitalization of land and survey records. It is also necessary in helping alleviate the growing concerns associated with land such as increased land disputes, lack of proper infrastructure planning such as sewerage and roads, land demarcations and zoning, and in carrying out feasibility studies for housing development, including affordable housing development.

The Nakuru County CIDP 2023-2027 reports key achievements in housing for 2018 and 2022 that included rehabilitation of 951 housing units, delivery of 605 affordable housing units through PPP, construction of 144 toilet blocks across county estates and 7.6km of sewer line, establishment of 5 centres for alternative building technologies, the launch of the county spatial plan 2019-2029, and issuance of approximately 240,000 title deeds in collaboration with the national government. This explains the high expenditures incurred in the development and management of houses and land use planning and survey.

5.8   Conclusion and policy recommendations

The cost of construction has gone up over the recent past due to increased prices of materials and cost of labour. The average cost of construction per square metre is KShs. 20,000 for residential houses. The prices of houses have also skyrocketed considering the high demand arising from rural urban migration. These two, construction cost and buying prices, have rendered over 70 per cent of the county's population living in urban areas to be tenants, while only less than 30 per cent own their housing.

The high cost of housing delivery, lack of construction finance, high cost of financing, and a larger population having no access to mortgage, has hampered the efforts of majority of the households in owning land and houses, or having private developers engage in affordable housing schemes. The costs and bureaucracies involved in obtaining construction approvals have rendered many opt not to seek necessary documentation during construction.

Despite the various constraints, the government's agenda of providing affordable housing through the AHP will enhance house ownership to low-income households. The provision of home loans and low interest loans, incentives to home buyers and developers under AHP would promote the ownership and development of affordable housing. The county government budget allocations towards the AHP targets development of 6,000 housing units, with other allocations going into repairs and maintenance. The County has made progress in the adoption of housing technologies (ABMTs), which provide opportunities for reducing the cost of materials and help fast track the development of affordable housing units. Other opportunities relate to leveraging PPPs, borrowing experience from the Bondeni slums housing development in partnership with private sector.

The county government of Nakuru can enhance various opportunities in the affordable housing programs through:

- Simplifying approval process and promoting standardized typologies for housing development.
- Providing public land for the development of affordable housing units: The national government, through the National Housing Corporation, has allocated over 150 acres in Nakuru East towards the AHP. Overall, the County has 260.5 acres of land that is currently under social housing units across various sub-counties (Nakuru East: 150.0 acres; Naivasha: 43.5 acres; Njoro: 42.0 acres; Gilgil: 15.0 acres; Bahati: 5.0 acres; Molo: 5.0 acres)[2]. Section 41 of

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[2] Data based on county data

the Affordable Housing Act, 2024, provides for the allocation of public land by the government towards the AHP, and where the county can allocate land after consultation with the Board, stakeholders, and community to be affected by the project.

- Invest in necessary infrastructure, particularly of water and human waste disposal, and electricity in urban areas to promote housing delivery.
- Embracing public-private partnerships: The government is seeking avenues to collaborate with the private sector in housing development projects. The use of Public-Private Partnerships (PPPs) could be one of the solutions, borrowing from the experiences of success stories in the County, such as the Nakuru Bondeni Affordable housing project. Under this PPP arrangement, the private investor (King Sapphire Developers, a subsidiary of Royal Group Industries) provided funding while the government provided a 7.5-acre piece of land formerly occupied by municipal houses to make the new units affordable. The Affordable Housing Act, 2024, section 44, provides for partnership between the Affordable Housing Board and the private sector, where the private institution undertakes the development and construction of affordable housing units or the supply of materials and goods for construction while the government provides land.
- Embrace social housing in the county. The constraints in affordability of housing development by individuals as evidenced by low income and high levels of unemployment indicate that very few people are in a position to save money enough to afford them enroll in the affordable housing programme under the Boma Yangu initiative.
- The launch of KShs. 117 billion County Integrated Development Plan 2023-2027: Among the county government of Nakuru flagship projects in the Agriculture, Rural and Urban Development subsector is the development of affordable housing targeting 6,000 units by 2027 with an estimated cost of KShs. 10 billion. The CIDP will also pave the way to key infrastructure developments including roads, water supply and sanitation, and electricity to complement the affordable housing infrastructure. The Nakuru county government projects the financing of the CIDP to come from national government's equitable share, conditional grants from GoK and development partners, county revenue collections, among others (CIDP 2023-2027).
- In enhancing affordability, the adoption of Alternative Building Materials and Technologies (ABMT): This is aimed at lowering the costs of building materials. Nakuru County government is exploring avenues to establish more centers for demonstration and training on various ABMTs and in the purchase of more interlocking machines. The Housing Technology programme targets the establishment of 4 more ABMT centers and 8 more interlocking machines at an estimated budget of KShs. 16 million and KShs. 14 million respectively as highlighted in the CIDP, 2023-2027.
- Provide mechanisms for financing housing development. This includes affordable home loans/mortgages for buying houses as provided for in the

Affordable Housing Act, 2024. The creation of awareness of such opportunities and the availability of affordable houses can be done through civic education, advertisement over mainstream and social media platforms, and workshops with various stakeholders.

- Providing affordable loans to buyers. The government to avail affordable housing scheme fund through banks, microfinance, and SACCOs where home buyers can access low-interest rate loans. The Kenya Mortgage Refinance Company (KMRC) has offered to increase is providing home-backed loans to lenders to increase availability of affordable home loans to middle and low-income earners.

# 6. Assessment of housing value chain-based investment opportunities and constraints in Nakuru County

6.1 Introduction

Understanding of housing value chains provides knowledge in planning and implementation of housing initiatives in Nakuru County. Housing value chain entails the process through which raw land is identified, planned, surveyed and registered, serviced and sold, and on which a house of whatever type is constructed, some financed with mortgage or unsecured finance, while some built incrementally. Further, the housing value chain describes the economic linkages and impacts related to the construction, ownership and rental of housing. It sets out what raw materials (stones and sand), manufactured goods and services (intermediate inputs such as cement, steel and timber, and services such as labour) are required, and where they are sourced in the economy.

6.2 Housing value chain: Key actors, roles, constraints and opportunities

The housing value chain entails delivery value chain for land acquisition, infrastructure development, house construction, sales and rentals, maintenance and planning for future social and economic infrastructure. In addition, other key components of the value chain entail finance and funding instruments.

Figure 6.1 Housing Value Chain
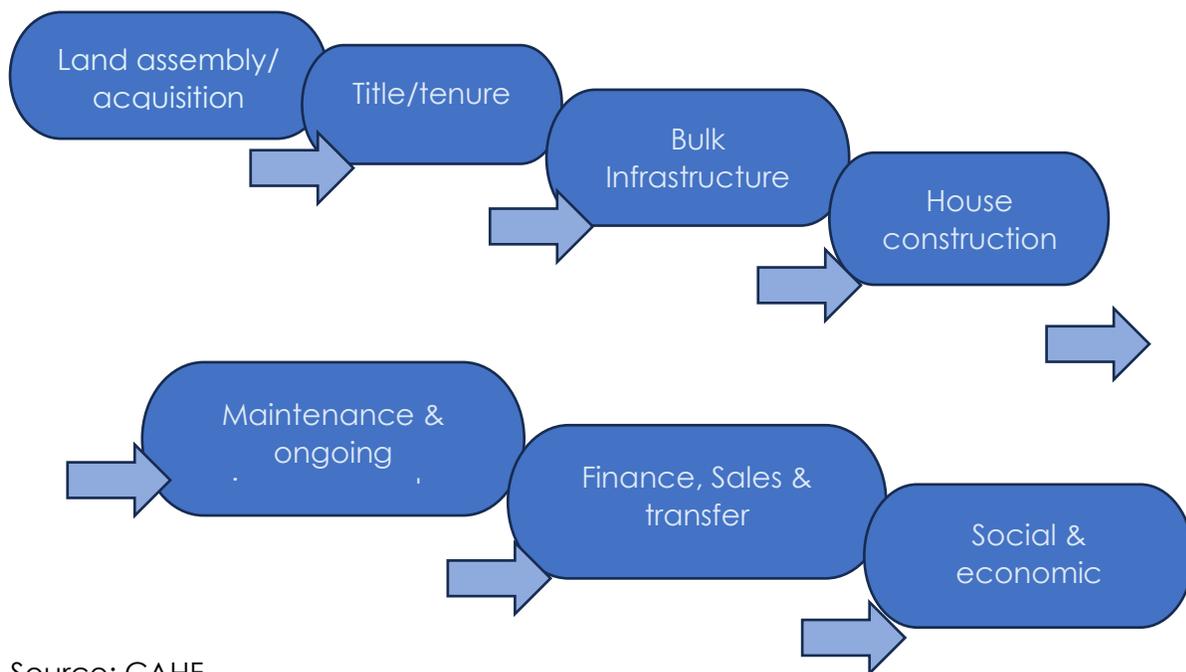
Source: CAHF

A housing value chain starts at the point where land is acquired where house construction happens within the county. Land is identified and secured, and infrastructure is installed (figure 6.1). A developer, contractor or household decides to produce a house, to meet a specific housing demand in the economy. The house is specified, designed and costed for the development. Overall, finance is budgeted and raised for land acquisition, infrastructure development, and the design and construction of housing. Then intermediate inputs such as building materials and manufactured components are ordered and brought to site. At this point, value added inputs (including management, capital, skills and labour, plant and machinery) in the construction sector are combined with these intermediate inputs to construct houses. This process results in new economic value being created in the economy through the construction sector in the county.

Based in the potential economic contribution of housing on the local economy of Nakuru country, the affordable housing programme will not only produce housing, but the housing construction and rental sub sectors are important creators and stimulators of economies, and directly stimulate local primary, secondary and tertiary economic sectors. The value chain on housing reveals that housing is an important employment creator and sustainer, if it is sustained and grown over time. Growing and maintaining a consistent level of housing construction and rental activity in Nakuru County is an economic priority beyond the need for shelter. The recent trend in the housing sector in the Nakuru county indicates an increasing trend primarily driven by active participation of private developers, rural-urban migration, and increased opportunities within the county after devolution.

There are several actors involved along the house value chain playing different roles. The key actors include- public agencies, developers, contractors, professional service providers (architects, engineers, quantity surveyors, marketing, management professionals), and offtake (individual households who are owners or tenants, investors, institutional investors, and government). Each component of the housing value chain requires finance and data collection and analysis by researchers and practitioners can help to understand the challenges faced and provide iterative solutions. The financiers are mostly from the private sector, including the major financial institutions in the county. Other private sector actors involved in housing investments in the county include developers, brokers and real estate managers who promote access to affordable and decent housing, public awareness campaigns, and contribute towards both development and financing of housing in the county, including PPP such as Bondeni housing project mainly catering for national housing scheme.

Both national and county government actors need to coordinate better and simplify processes to provide a conducive policy environment for the housing sector to thrive. The key government actors include the Nakuru county government's physical planning and housing departments, National Construction Authority (NCA), National Housing Corporation (NHC), National Environment Management Authority (NEMA) and the National Building Inspectorate. These actors provide policy and legal measures to guide and regulate the housing sector

Despite significant policy efforts made in the county, the housing sector experiences key constraints that include: constraints in access to affordable land, infrastructure, high development costs, long approval processes, financial constraints, inefficient building standards and safety, lack of public awareness and mismatch between design of houses and the needs of majority of the population are among the affordable housing challenges in the county. Further, the housing value chain across counties is vulnerable to disruptions due to logistical challenges, regulatory bottlenecks, and fluctuating material costs. In recent times, cases of building collapse have been reported largely driven by weak enforcement and poor adherence to the established building regulations. The high percentage of housing construction in the county done without necessary approvals is leading to construction of substandard buildings that require frequent maintenance. Although there is a newly approved building code with better standards, the developers and contractors in the County still rely on using poor standards, hence a barrier towards putting up quality buildings. The lack of proper certification in the construction industry for various housing construction professionals is negatively affecting the quality and efficiency of housing delivery across the county.

Other constraints include: High cost of raw materials and labour hence increasing the cost of buying and renting houses. Access to diverse financing options, including microfinance, mortgage loans, and investment from pension funds has remained to be a key challenge to provide capital and financial resources as well as developing a framework for concessional financing in the housing sector. Further, Real estate developers across counties are increasingly targeting the growing high income and middle class while leaving out the low-income and some middle-income groups. The delays and high cost of maintaining buildings contribute to reduced shelf life of buildings and degrade human health. Table 6.1 provides a summary of actors, their roles, constraints and opportunities based on the feedback from the Focus Group Discussion held in the County.

Table 6.1: Summary of actors, roles, constraints and opportunities across the value chain

Value Chain Stage	Actors involved	Activities/Roles	Constraints	Opportunities
Pre-development	Government actors (County and National governments)	• Policy formulation • Enforce implementation of regulatory measures • Grant approvals	• Too many processes, too costly and too much time • Low levels of automation • Bureaucratic approvals • Integrity issues	Promote one stop shop by leveraging on digitalization
	Investors and Contractors	Site identification, acquisition and preparation (e.g land surveyors)	• Land tenure • High cost of land • Difficulty in land transactions due to poor functioning land registries • Fake land ownership documents	Leverage on government commitment of affordable housing
	Investors and Contractors	Seek approval processes (drawings and environmental impact assessment)	• Many requirements to register that are costly	Leverage on government commitment of affordable housing
	Professionals	Provision of professional services – planning, surveying, architectural designs	• Too many technicalities – too many involved in the process, hence making it very expensive and open to poor	• Increased awareness on policy reforms on the roles of professional • Effective feasibility study for business justification • Consider experiences and qualifications • Capacity building

Value Chain Stage	Actors involved	Activities/Roles	Constraints	Opportunities
			design and feasibility. • Procurement process of such professionals is not well established – prequalificatio n • Low involvement of local professionals in AH schemes • Slow approval process • Mandatory expensive scale fees which do not account for the replication of work	• Enforcing legal framework for different professionals • Revising Acts relating to professionals (Architects and surveyors Act)
	National and County Government	Approvals and enforcement of building regulations	• Slow approval process • Integrity issues	Leverage on digitalization agenda (digital superhighway)
Development	Investors and Contractors	Construction (e.g. Building inspection, architectural design, structural, electrical and civil works, interior design, finishing)	• Delays in payments • Limited Financing to developers	• Government commitment to clear pending bills • Engage on PPP Frameworks
		Seek approval processes (drawings and environmental impact assessment)	Many requirements for licensing that you	Leverage on government commitment of affordable housing

Value Chain Stage	Actors involved	Activities/Roles	Constraints	Opportunities
			are required to pay for them all	
		Access to infrastructure and basic services (water, electric roads)	Poor access to infrastructure services	Leverage on government commitment of affordable housing
		Utilization of building innovations and technologies (eg. Renting of mixers, use of innovative tech and materials to reduce)	High cost of new technologies	• Leverage on government commitment of affordable housing • Seek financial support from financial service providers
		Supply of raw materials (e.g. Hardware, water vendors	• High cost of raw materials due to high taxes • High transport cost • Costly housing loans • KMRC has not scaled up financial support for affordable construction finance to deliver the units	Leverage on government commitment of affordable housing • Consider providing tax incentives on building raw materials
	National and County Government	Approvals and enforcement of building regulations	• Low levels of automation • Bureaucratic approvals • Integrity issues	Leverage on digitalization agenda (digital superhighway) to enhance efficiency and transparency
	Professionals	Provision of housing services	• Low involvement of local	Tap on the existing local talents Reduce mandatory scale fees as this adds onto housing cost and

Value Chain Stage	Actors involved	Activities/Roles	Constraints	Opportunities
			professionals in AH schemes • High scale fees act as a barrier for housing projects to use professionals and create incentive	reduces affordability – particularly due to heavy replication of designs etc. fees should be market driven as in other countries.
Post-development	County Government	Management of public housing stocks	• Poorly maintained public housing stock • Low rent payment rates • Fraudulent collectors of monies owed to the county	• Policy reviews on housing • Leverage on digital platform to manage public housing stock
	Professionals	Provide sales and marketing services	Fraudulent marketers for houses	Leverage on digital technologies for marketing
	Tenants and Buyers	Occupation (rental income, mortgages, property management/managers)	Low access to credit services	Financial arrangements with financial institutions to support loan prequalified borrowers at lower rates
			• Availability of affordable housing/ The supply for AHP is very low • Housing price for affordable and social housing is	Government has identified affordable housing a key priority

Value Chain Stage	Actors involved	Activities/Roles	Constraints	Opportunities
			considered high	
		Maintenance (e.g. repairs, plumbing, re-painting)	• Poorly maintained sold and rented houses • Low budget allocation on maintenance	Government has identified affordable housing a key priority
Cross cutting	Researchers	Conduct research on feasibility of housing projects and provide new building materials and technologies	• Low number of feasibility studies on housing • Lack of sharing data • Limited technical skills to develop new/improved building materials	Leverage on government commitment of affordable housing Need to share data to inform policies and planning of the housing sector
	Housing cooperatives	Provide members with loans Invest in buying land, constructing houses for sales	• Poor management of resources	Leverage on government commitment of affordable housing

6.3   Conclusion and policy recommendations

The absence of a comprehensive policy and law on housing at the county level hampers the efforts to plan, develop, and provide timely maintenance to social and affordable houses that the County has put in place as well as for future developments. Nakuru County needs a comprehensive housing policy for its housing value chain. This will not only provide job opportunities to thousands of Nakuru residents but will improve the overall quality of life for its residents. Key policy issues along the housing value chain include: limited access to affordable land, high development costs, long approval processes, and a skills gap in construction. Issues like low-quality materials result in substandard housing. Furthermore, high raw material and labour costs affect affordability, with many developers focusing on higher-income groups, leaving lower-income populations underserved. Logistics and fluctuating material costs also disrupt the housing value chain.

The study makes key recommendations that include promoting one stop shop, providing tax incentives on building raw materials, and revising Acts relating to professionals (architects and surveyors Act). Technology platforms which support more efficient approvals, standardization and collection of data can be created alongside. Provision of incentives to developers is key in increasing housing affordability in the county. Further, as the county plans to develop an effective intervention for managing public housing stock including maintenance, the following considerations should the guiding principles: Environmental sustainability; Inclusiveness to all members (women, youth, persons with disabilities, different incomes); Design maintainability; Disaster prevention; Safety, health and convenience; Return on investment; Technological advancement; Cost effectiveness and efficiency; Statutory compliance; Good governance; and Building Life Cycle Costing.

Further, the County to consider employing various maintenance strategies as outlined in the National Building Maintenance Policy that include the following:

- Develop a Risk Management Strategy to address environmental, health and safety issues
- Develop Financial Management Strategy to fund planned and preventive maintenance activities and establish a sinking fund for priority maintenance which shall be 5 per cent of the value of the asset
- Develop a Procurement Strategy to guide on the procurement of maintenance works, tools and materials in all buildings and ensure maintenance is done in a procedure that provides value, fairness and transparency to conform to the set building maintenance standards
- Develop a Health and Safety Management Strategy to meet the health, safety and environmental standards under relevant legislation such as

Occupation Health and Safety Act (OSHA), Environmental Management and Coordination Act (EMCA) and in line with Kenya constitution, 2010

- Develop a Building Life Cycle Costing Strategy to guide on the cost of putting up a new building, operating and maintenance
- Develop a Monitoring, Evaluation and Research strategy for effective monitoring and evaluation of planned activities and set standards of maintenance work
- Develop an Information Management System strategy to guide on collection, storage, retrieval, analysis and custodianship of maintenance data. A case example is the Open Access Initiative by Centre for Affordable Housing Finance in Africa (CAHF) which aims at harnessing the collective learnings and experiences produced by various stakeholders in their investments in affordable housing.

Although the National Building Maintenance Policy 2015 seeks to establish a sinking fund for priority maintenance which shall be 5 per cent of the value of the asset, the fund is likely to be inadequate to cater for the huge costs required to maintain thousands of houses in the county. There is need to review this rate at the county level to reflect on the key factors such as: Building characteristics (age, height, type of structure, materials), Tenant factors (expectations of tenants, use of the property, damages, accessibility), Quality of Maintenance performed (quality of workmanship, quality of materials and equipment, maintenance management, budget allocation), and Political factors (political agenda, government regulations).

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Appendix 1: Household Characteristics

The Kenya Population and Housing Census (KPHC), 2019, showed that the average household size in Nakuru County is approximately 4.5 persons per household. This is slightly higher than the national average of 4 persons (KNBS, 2019). Approximately 20.7 per cent of households fall into small households (1-2 members) category. These are often single-person households or small nuclear families, prevalent in urban areas. Medium-sized households (3-4members) is the most common household size in the Nakuru County, comprising about 45.1 per cent of households.

Around 34.2 per cent of households represent large households with 5 or more members. This indicates that most households across urban centres in Nakuru County are predominantly small family units, which presents a major factor in implementing the Affordable Housing units. Smaller households drive demand for compact housing units, such as apartments or smaller rental properties while larger households require bigger housing units.

Figure a.1: Household size distribution
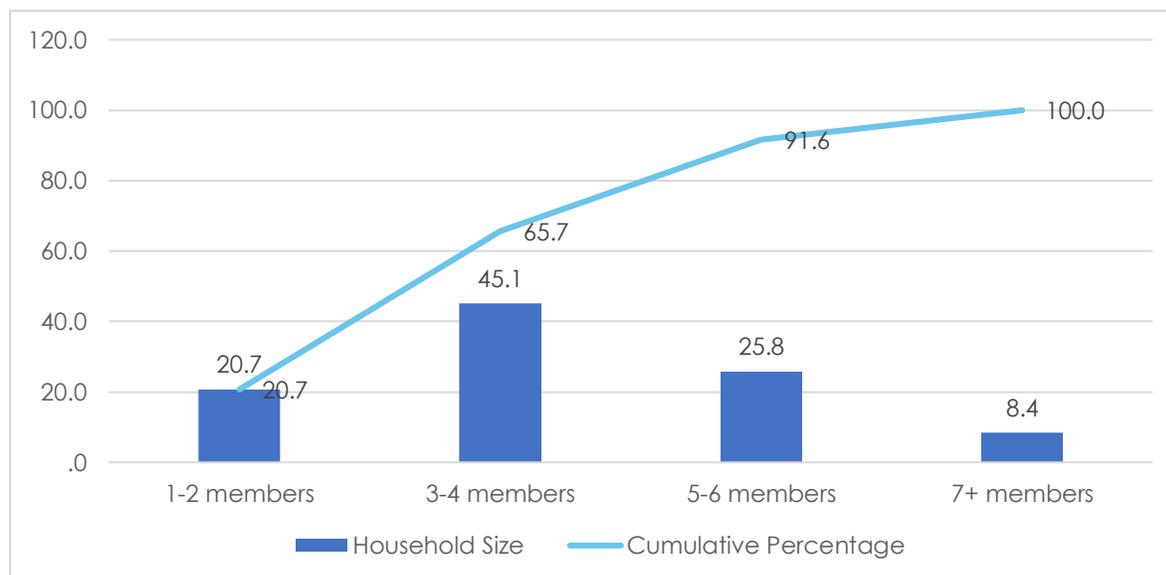
Computed from the KIPPRA Survey 2024

Understanding the distribution of household heads by gender is crucial for designing housing programs and policies. The KIPPRA survey (2024) revealed that 76.7 per cent of households are headed by males and 23.3 per cent by females. This implied that households in the County embrace a patriarchal system, although women are also key in decision-making. Therefore, both male and female-headed households are central for involvement in the affordable housing programmes.

Notably, households with a married couple stood at 62 percent while the singles stood at 24 percent (Figure a.2). This implies that housing programmes should also consider single housing units such as affordable bedsitters and studio apartments.

Figure a.2: Household by marital status
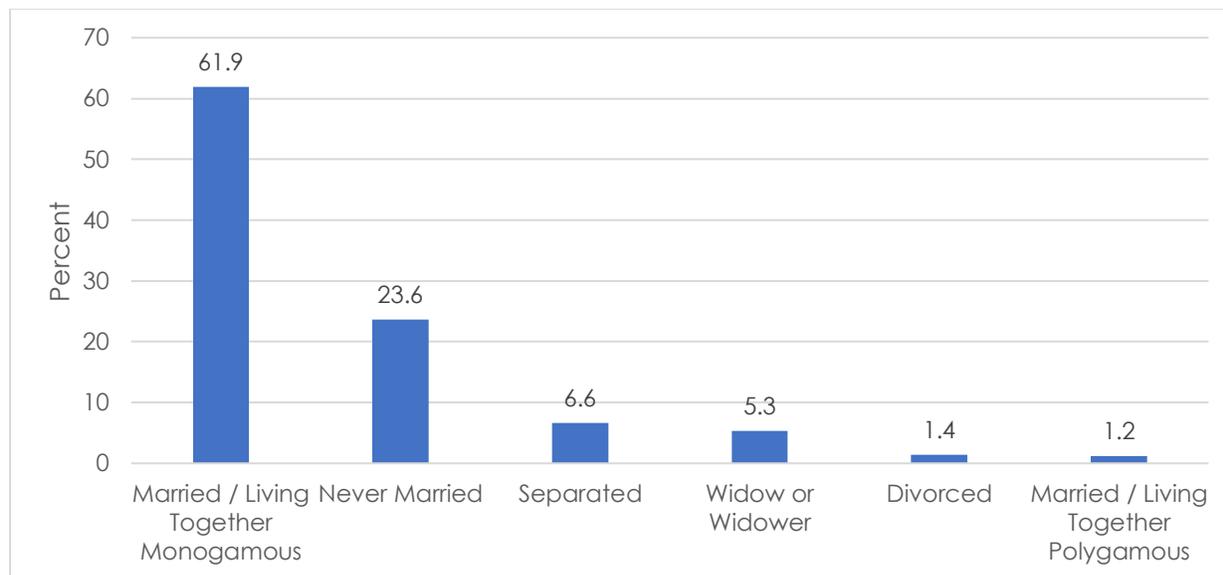
Source: KIPPRA Survey 2024

Age and dependency ratio also plays a key role in understanding the target population for affordable housing programmes. In terms of distribution by age groups, most of the Nakuru County residents are aged between 15 and 64 years (67.3 percent) while 28.8 percent is reported across age group 0-14 years and 3.9 percent are aged 65 years and above (KNBS, 2019) This reflects a low old-age dependency ratio for Nakuru County, which can be attributed to the urban-rural migration after retirement. This suggests implementation of programmes that consider youthful and working age populations' interests and preferences living in Nakuru County.

A Housing income bracket is also a critical component in targeting affordable housing beneficiaries. Total average monthly income refers to the total average earnings of all earnings of all the household members. Figure a.3 shows that a majority of the Nakuru County Urban residents (81.7 per cent) earn less than Kes 20,000 per month and will require formal social housing as defined in the National Housing Development Fund Regulations 2020.Formal housing would be inadequate for most low-income earners due to low purchasing power. The mortgage gap stands at 1.1 per cent while the low-cost housing category comprises of 15.8 percent. Therefore, the government's plan for social, low-cost and mortgage gap housing under the affordable housing project will go a long way in supporting most households in Nakuru City County

Figure a.3: Household income groups for urban Nakuru County residents
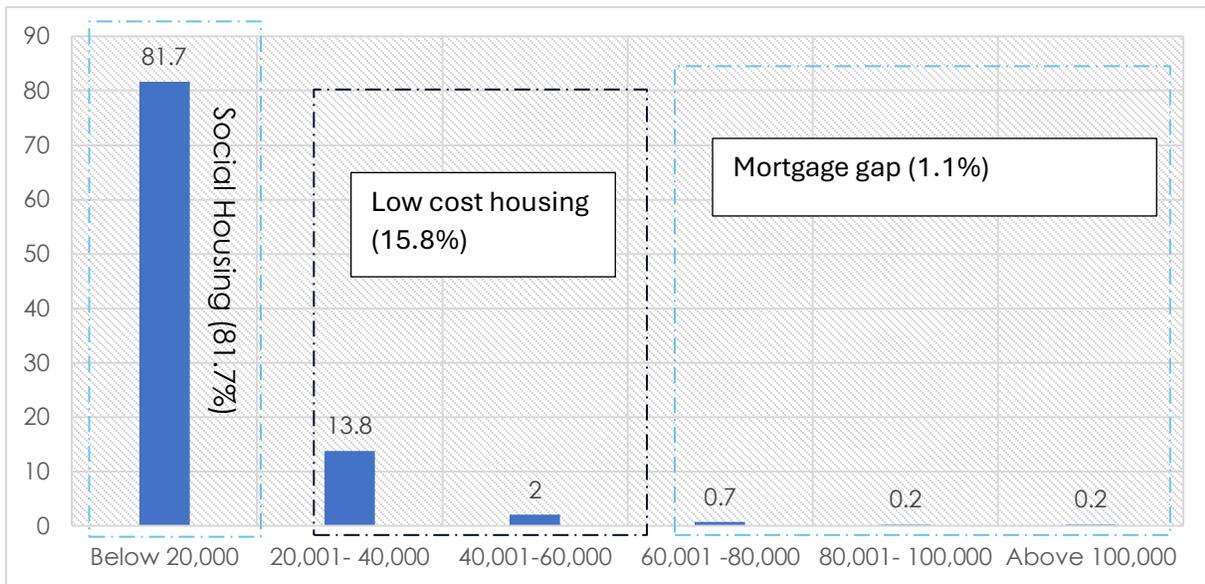
KIPPRA Survey 2024

Appendix 2: Status of Nakuru Social Housing Stock

Table b.1 gives a summary of the status of Nakuru County Social Housing Stock. It disaggregates the housing stock into the housing estates across the various sub counties, the land area occupied and the total number of units. It is noted that a huge percentage of the county's social housing units are domiciled in Nakuru Town East, followed by Naivasha and Njoro then Rongai sub counties.

Nakuru Town East leads in the share of county housing units at 4,821 units (90.8%), Naivasha at 451 units (8.5%), Njoro 24 units (0.5%) and Rongai at 13 units (0.2%). This is breakdown of table 4.3.

Table b.1: Nakuru Housing Stock inventory

Subcounty Name	Land Area (% Share of County Housing Units)	Housing Estate Names	Number of Housing Units
Nakuru Town East	150 Acres (90.8%)	Baharini	512
		Bondeni Maternity	-
		Bondeni Primary	15
		Burma Worshops	24
		Dedan Kimathi	456
		Fire Station	-
		Flamingo	1288
		Garage	23
		Jamhuri Primary	7
		Kaloleni	752
		Kivumbini	624
		Lanet Primary	-
		Lower Misonge	25
		Lumumba	192
		Mama Ngina Primary	5
		Moi Flats	59
		Mortuary	2
		Nakuru Press	84
		New Ojuka	44
		Ngala Flats	52
		Old Ojuka	-
		Paul Machanga/Abongloweya	384
		Shauri Yako	292
Njoro	42 Acres (0.5%)	Bondeni	14
		Posta House (Mau Narok)	10
Naivasha	43.5 Acres (8.5%)	Naivasha	451
Gilgil	15 Acres		-
Nakuru Town West	-		-
Rongai	-	Rongai	13

Bahati	5 Acres		-
Subukia	-		-
Molo	5 Acres		-
Kuresoi North	-		-
Kuresoi South	-		-

Appendix 3: Nakuru Housing Policy Spatial Analysis by AMT
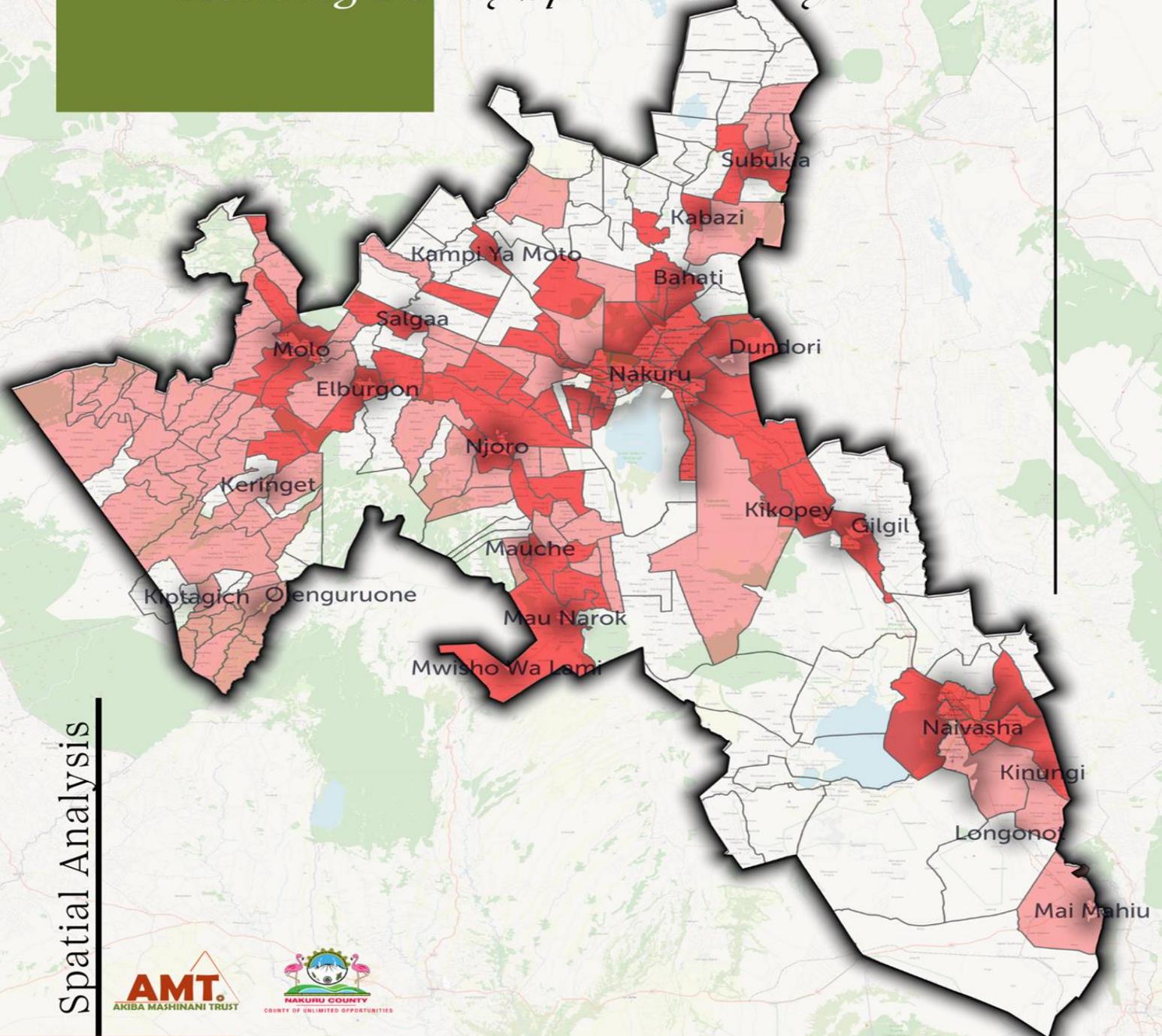
Executive Summary

This report presents an analysis of urban expansion in Nakuru County over 14 years from 2010 to 2024. The primary focus is on understanding the patterns and dynamics of urban growth across several key towns within the county to aid in understanding the housing situation for the formulation of the Nakuru County Housing Policy. By utilizing advanced satellite imagery analysis through Google Earth Engine (GEE), the study evaluates the expansion of urban areas using indices such as the Normalized Difference Built-up Index (NDBI) and the Modified Normalized Difference Water Index (MNDWI). The analysis reveals significant variations in urban growth, with pronounced expansion rates observed in 2014, 2017, 2019 and 2022. The towns analysed include Nakuru City, Naivasha, Maai Mahiu, Kinungi, Longonot, Gilgil, Kekopey, Elburgon, Molo, Njoro, Mau Narok, Mwisho wa Lani, Mauche, Subukia, Kabazi, Salgaa, Kampi ya Moto, Bahati, Dundori, Keringet, Kiptagich, Olenguruone. Based on the findings, the report recommends ongoing monitoring, improved urban planning, and the implementation of sustainable policies to manage the rapid urbanization in Nakuru County effectively.

Table of Contents

List of Maps

List of Figures

INTRODUCTION

1.Background

Nakuru County, located in Kenya's Rift Valley, has experienced rapid urbanization in recent years, transforming it into one of the most populous and economically vibrant regions in the country. The county's strategic location, coupled with its growing population and expanding infrastructure, has led to significant urban growth across various towns. This trend, while contributing to economic development, has also brought about challenges related to infrastructure, housing, and environmental sustainability. Understanding these urbanization patterns is critical for informed decision-making and future urban planning in the county.

Objectives

The objective of this study is to assess the extent and patterns of urban expansion in Nakuru County from 2010 to 2024. The analysis seeks to answer the following key questions:

1. What changes in urban area size have occurred in Nakuru County over the study period?
2. Which towns have experienced the most significant growth?
3. How do these growth patterns impact sustainable urban development and housing in the county?

Scope

This analysis covers the urban expansion of 22 key towns in Nakuru County over a 14-year period. The towns included in this study are Nakuru City, Naivasha, Maai Mahiu, Kinungi, Longonot, Gilgil, Kekopey, Elburgon, Molo, Njoro, Mau Narok, Mwisho wa Lami, Mauche, Subukia, Kabazi, Salgaa, Kampi ya Moto, Bahati, Dundori, Keringet, Kiptagich, Olenguruone:

- **Nakuru City**: The county's largest urban centre and a crucial economic hub that has seen substantial growth.
- **Naivasha Municipality**: A rapidly expanding town known for its agricultural output and tourism, contributing significantly to the county's economy.
- **Gilgil Municipality**: A strategically important town with proximity to Nairobi, experiencing steady urban growth.
- **Molo**: A town with a strong agricultural background, currently witnessing moderate urban expansion.
- **Njoro**: A town with significant educational institutions and growing residential areas.
- **Rongai**: A town supported by its agricultural hinterland, showing steady urban development.
- **Subukia**: A smaller town with emerging urban characteristics, gradually expanding.

- **Bahati**: Known for its agricultural activities, this town is also experiencing gradual urbanization.
- **Longonot**: A town with growth potential, especially in tourism, due to its proximity to Mount Longonot.
- **Mai Mahiu**: Strategically located along the Nairobi-Nakuru highway,

The analysis focuses on the period from 2010 to 2024, providing insights into both long-term trends and recent developments in urban expansion within the 22 urban settlements.

Methodology

4.1 Data Collection

This study utilized satellite imagery from the Sentinel-2 and Landsat missions, both renowned for their high resolution and reliability in Earth observation. Specifically, Sentinel-2 imagery, provided by the European Space Agency (ESA), was employed to capture data from 2015 to 2024, offering a 10-meter resolution ideal for detailed urban analysis. For the years prior to 2015, the study relied on Landsat data, encompassing Landsat 4, 5, 7, and 8, which provides a resolution of 30 meters. The study focused on the period from 2010 to 2024, capturing significant changes in urban expansion across Nakuru County. The selection of these datasets ensures comprehensive coverage and facilitates the analysis of trends over an extended timeframe, providing a robust foundation for understanding urban growth dynamics in the region. The imagery to be used was specified to be obtained between the months of April and May throughout the analysis period. This was to ensure consistency in the imagery and that the imagery obtained does not show a very varied tune period where the reflectance is different. The months of April and May were relatively when the area was green to prevent false readings.

4.2 Analytical Tools

The analysis was conducted using Google Earth Engine (GEE), a powerful cloud-based platform designed for planetary-scale environmental data analysis. GEE allows for the processing of large datasets, such as Sentinel and Landsat imagery, and offers a suite of tools for remote sensing analysis. To quantify urban expansion, the study employed two key indices:

- Normalized Difference Built-up Index (NDBI): This index highlights built-up areas by comparing the reflectance values of near-infrared (NIR) and shortwave infrared (SWIR) bands. NDBI effectively identifies urban areas, differentiating them from other land covers such as vegetation and water.
- Modified Normalized Difference Water Index (MNDWI): MNDWI is utilized to delineate water bodies, which is essential for accurate differentiation between urban and water-covered areas. This index compares the reflectance in the green and SWIR bands, effectively highlighting water features in the imagery.

4.3 Calculation of Urban Expansion

The calculation of urban expansion involved a systematic approach to classify land cover based on the NDBI and MNDWI indices. The process included the following steps:

Classification of Land Cover: The NDBI values were thresholder to identify built-up areas. This classification enabled the extraction and mapping of urban areas over the years of interest.

Area Calculation: Once the built-up areas were identified, their spatial extent was calculated using GEE's built-in area computation functions. The areas were initially computed in square meters and then converted to hectares (1 hectare = 10,000 square meters).

Compilation of Results: The results for each year were compiled to provide a comprehensive overview of urban growth throughout the study period, allowing for the identification of trends, peaks, and changes in urbanization patterns across Nakuru County.

This method ensured a consistent and accurate estimation of urban area expansion across all towns in Nakuru County from 2010 to 2024.

4.4 Calculation of Urban Density

Urban density creation began with importing the necessary functions and datasets needed to operate. Then the areas of interest in this case: Nakuru: This feature collection represents the geographical boundary of the 24 towns in Nakuru county where the policy housing research will take place. These boundaries were developed based on digitization of the areas with substantial urban development. They do not represent the actual municipal and town boundaries. Some of them cover a larger area compared to the official boundaries. L9: This refers to a collection of Landsat 9 (LC09/C02/T1_L2) satellite images. These images capture various wavelengths of light reflected from Earth's surface. roi: This feature collection represents the same area as Nakuru, used for filtering and clipping purposes later. The script also adds the Nakuru feature collection as a visual layer on the map for reference.

The code defines a date range (start (2024-01-01) and end (2024-05-23)) to filter the Landsat 9 image collection. This ensures only images captured within that period are used in the analysis. A function named CloudMask is then defined. This function takes an image as input and performs cloud masking. Cloud masking removes pixels that are obscured by clouds from the analysis since clouds can significantly alter the spectral properties of the land surface observed by the satellite sensor. The CloudMask function works by selecting specific bands from the image (QA_PIXEL) that contain quality assurance information. It then performs bitwise operations to identify pixels that are not masked by clouds, circuses, shadows, or other atmospheric disturbances. Finally, it scales the image values to a range of 0 to 1 and selects only relevant bands for further analysis (bands B1 to B7).

The filtered and cloud-masked Landsat 9 image collection is then used to create a median composite. A median composite represents the 'middle' value for each pixel across all the images in the collection. This helps to reduce the influence of outliers and

passing clouds. The composite image is then clipped to the area of interest (roi) defined earlier.

The script then defines a bandMap object that simplifies referencing specific bands within the image. It assigns shorter names (NIR, SWIR1, and SWIR2) to the near-infrared (NIR), short-wave infrared 1 (SWIR1), and short-wave infrared 2 (SWIR2) bands, respectively. Next, the script calculates two spectral indices commonly used for urban area detection: Normalized Difference Built-Up Index (NDBI): This index leverages the difference between NIR and SWIR1 bands. Built-up areas typically have lower reflectance in NIR compared to SWIR1. The NDBI layer is added to the map with a colour palette ranging from blue (low values) to white (intermediate values) to red (high values).

Normalized Burn Ratio 2 (NBR2): This index utilizes the difference between SWIR1 and SWIR2 bands. Dense vegetation generally has higher reflectance in SWIR2 than SWIR1. The NBR2 layer is also added to the map with a similar colour scheme as NDBI.

The script utilizes the thresholds on both NDBI and NBR2 layers to identify areas that are likely built-up. Pixels with NDBI values greater than or equal to -0.1 and NBR2 values less than or equal to 0.2 are classified as built-up. This thresholding technique assumes that built-up areas tend to have specific spectral characteristics reflected in these indices.

A layer named built is created representing the identified built-up areas. This layer is visualized on the map using a red colour to indicate built-up areas.

The final step involves calculating urban density. Here, the built layer is subjected to a focal mean operation. This operation considers a neighbourhood of pixels (defined as 3 pixels in this case) around each pixel and calculates the average value within that neighbourhood. This helps to smooth out the classification results and reduce the influence of isolated pixels.

The resulting urban density layer represents the relative density of built-up areas within a local area. This layer is reprojected to a 30-meter pixel resolution for consistency with the original image. The urban density layer is finally visualized on the map using a colour gradient ranging from black (lowest density) to red (highest density), with intermediate colours like purple, blue, cyan, green, and yellow representing progressively higher urban densities.

This colour scheme effectively conveys the spatial distribution of urban density within Nakuru. Areas with a higher concentration of built-up structures will appear red, indicating high-density concentration.

Based on the generated Build-up area from the operation. The areas with high building density are overlayed over a satellite image and digitized as the town boundaries. Following natural features such as rivers and infrastructure outlines like roads and railway outlines.

Figure 5:Snipet of the Data Processing interface
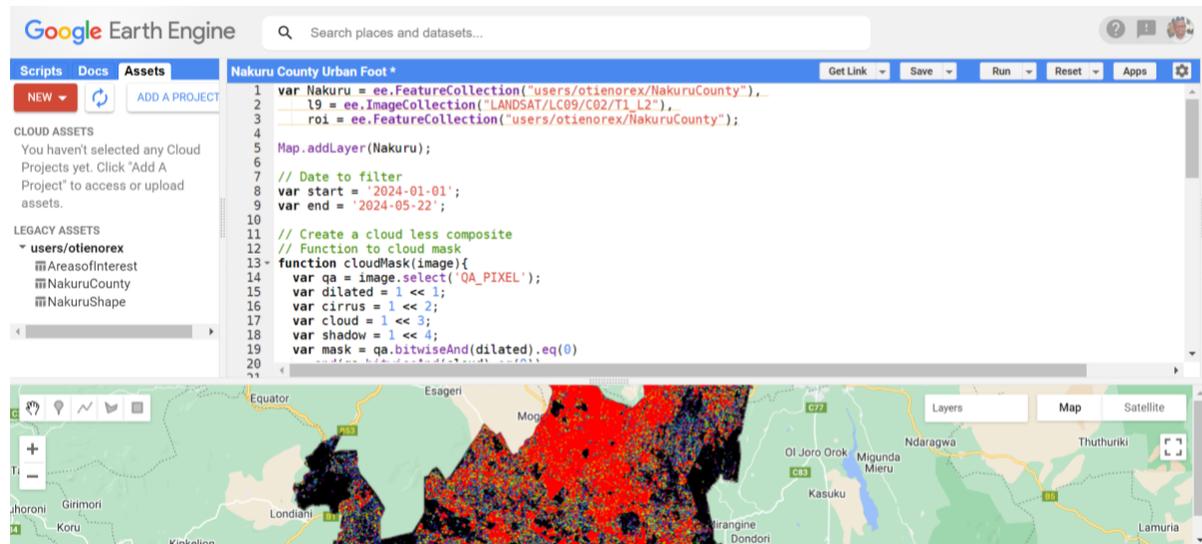
4.5 Population Density and Shapefile Attributes

For the analysis of urban density in Nakuru County, population density data was adopted from the 2019 Population and Housing Census. This data provides a critical context for understanding the relationship between urban expansion and population dynamics in the region.

The Nakuru shapefile, which contains the administrative boundaries of the sublocations in Nakuru County, was enhanced by adding three key attributes:

- **Population (2019)**: This attribute reflects the total population recorded in the area during the 2019 census. It serves as a foundational dataset for analysing demographic trends and urban growth.

- **Population Density**: This attribute was calculated by dividing the total population by the land area of each administrative unit. It provides insights into how densely populated each town is, allowing for a better understanding of urbanization patterns.

- **Number of Households**: This attribute indicates the total number of households within each administrative boundary. It is essential for assessing housing availability and urban infrastructure needs in relation to population density.

Findings

5.1 Population Density

Population density data reveals that the highest population densities are concentrated within the sublocations where urban areas are located. This spatial distribution suggests a strong correlation between urban development and population concentration.
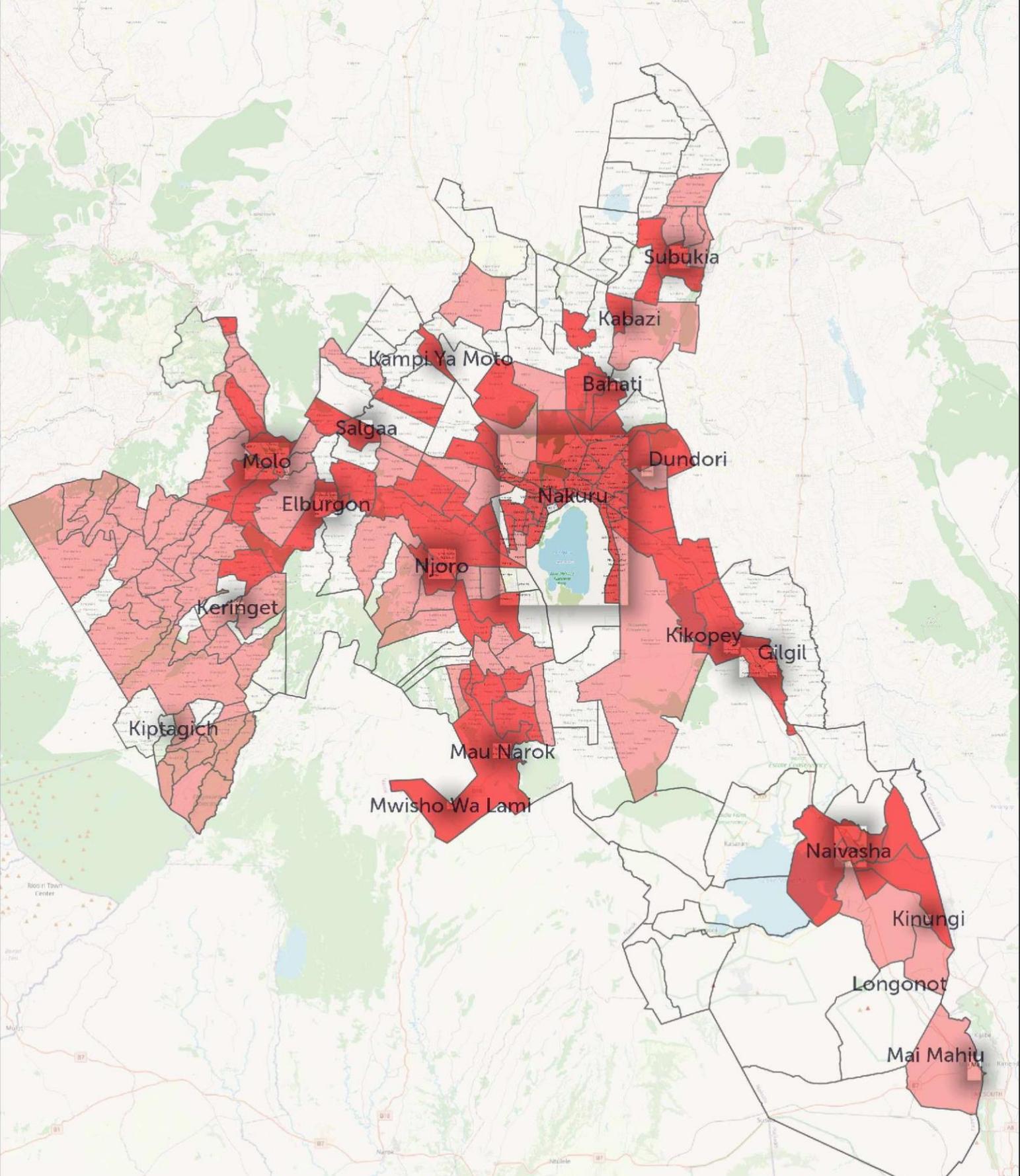
Moreover, the core centers of the urban areas exhibit the highest population densities compared to the surrounding areas. This finding indicates that the central business

5

districts and other key urban hubs attract and sustain larger populations, likely due to factors such as employment opportunities, access to services, and economic activities.

The map on population density clearly illustrates these patterns, highlighting the areas with the highest population densities within the urban centers. This spatial analysis provides valuable insights into the relationship between urban development and population distribution, which can inform urban planning and resource allocation decisions.

Nakuru County
Population Density

Subukia

Kabazi

Kampi Ya Moto

Bahati

Salgaa

Molo

Dundori

Elburgon

Nakuru

Njoro

Keringet

Kikopey

Gilgil

Kiptagich

Mau Narok

Mwisho Wa Lami

Naivasha

Kinungi

Longonot

Mai Mahiu

Legend

Low

Median

10   0   10   20   30   40   50 km

5.2 Building Density Analysis

Building density in Nakuru County exhibited a trend like that of population density, with areas in the city center showing a greater concentration of buildings compared to those in the periphery. This correlation between building density and population density underscores the urbanization patterns within the region, where central urban areas are more developed and densely constructed.

5.3 Classification of Urban Centers by Density Types

To facilitate a structured analysis of urban development, the urban centers were classified into three distinct density types based on building concentration:

- **High Density**: Areas with a high concentration of buildings, typically found in the city center, were classified as high density. These regions are characterized by multi-story buildings, commercial establishments, and a vibrant urban atmosphere.

- **Medium Density**: Areas with a moderate concentration of buildings were classified as medium density. These regions often feature a mix of residential and commercial structures, providing a balance between urban and suburban characteristics.

- **Low Density**: Areas with scattered buildings and lower overall building concentration were classified as low density. These regions are often more residential in nature, with single-family homes and open spaces.

This classification system enabled effective data collection by ensuring that all areas were adequately covered for the administration of questionnaires related to the housing policy. By understanding the density types within each urban center, researchers could tailor their outreach efforts and ensure that the perspectives of residents in both densely populated and less populated areas were captured. This comprehensive approach enhances the robustness of the data collected and contributes to more informed decision-making in urban planning and policy development.

Nakuru City
*Building Density*
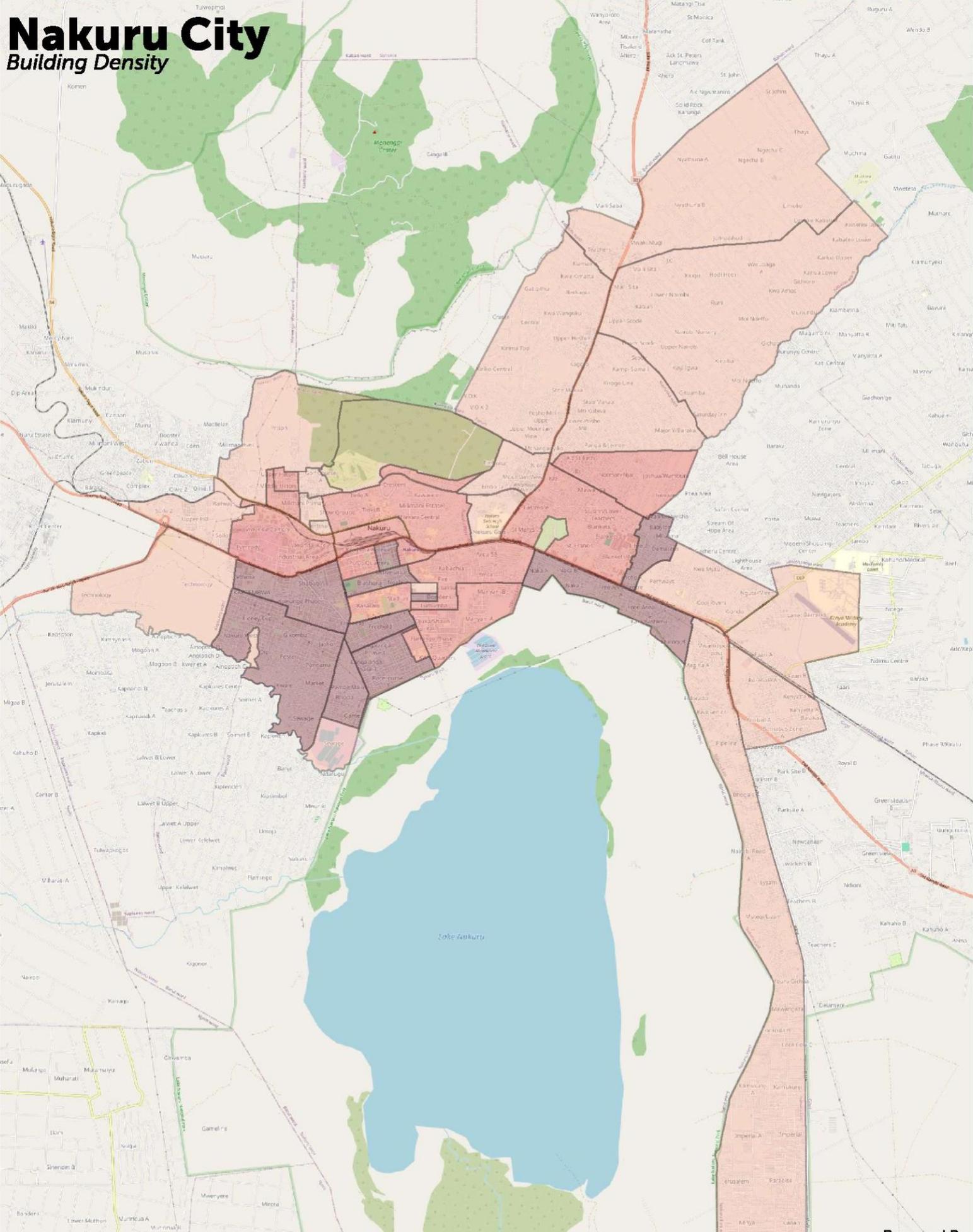
Legend

High

5.4 Urban Expansion Trend

5.4.1 Cumulative Yearly Analysis

The urban expansion of Nakuru County between 2010 and 2024 follows a dynamic pattern, with notable fluctuations across different years. The cumulative analysis shows that periods of substantial growth were not consistent, revealing a changing development trajectory.

Figure 6: Urban Growth yearly Percentage (Base Year 2010)
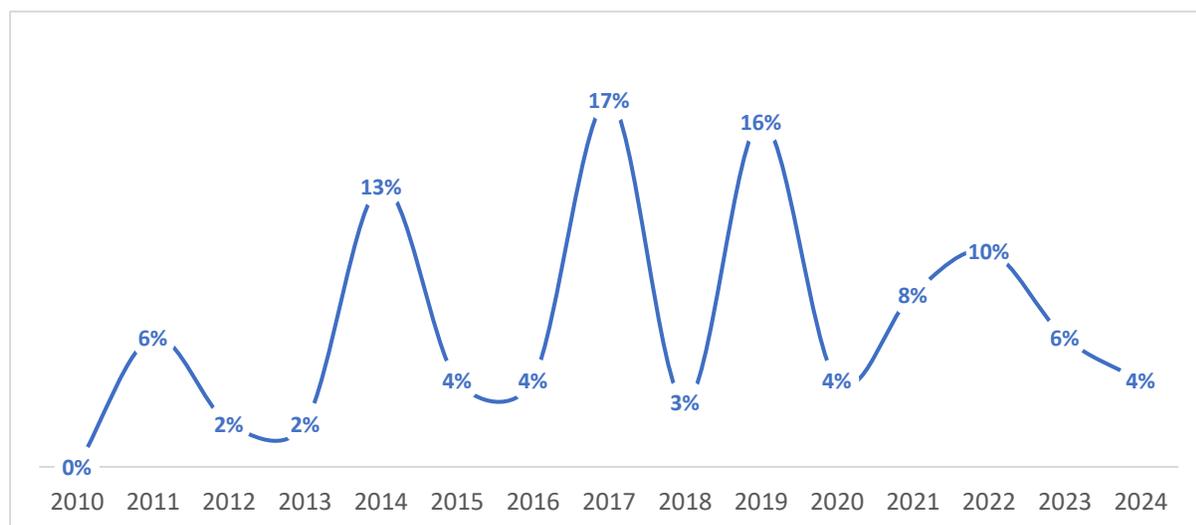
- **2010:** In the year 2010, the total urban area in Nakuru County Urban Centres was approximately 14,031,651 hectares. This period marks the baseline for the urban expansion analysis, providing a reference point for subsequent growth.
- **2012:** By 2012, the urban area expanded by 18,317,944 hectares, indicating a significant increase.
- **2014:** The urban area witnessed a remarkable jump to 39,981,539 hectares in 2014. This dramatic increase reflects accelerated urbanization.
- **2016:** Following the peak in 2014, the urban area growth was 22,161,302 hectares   a relative decrease from the previous year.
- **2018:** In 2018, the urban area growth rate contracted further with a mere increase of 12,526,734 hectares. This reduction suggests a phase of slowed urban expansion.
- **2020:** A resurgence in urban expansion occurred by 2020, with the area growing by 20,419,325 hectares. A drop from the previous years' expansion but an increase compared to 2018
- **2022:** Urban area grew by 45,077,346 hectares in 2022 compared to 2020.
- **2024:** The analysis concludes with a slight decrease in urban area growth to 16,667,107 hectares in 2024.

The data reveals that urban expansion is not simply a continuous process but one that is highly responsive to socio-economic conditions. During periods of robust growth, the area under urban development increased exponentially, whereas in slower years, such as 2018, the growth rate sharply declined, indicating potential constraints such as economic slowdowns or urban management challenges.

5.4.2 Cumulative Growth Patterns

The cumulative growth patterns from 2010 to 2024 underscore Nakuru County's unique development trajectory, characterized by distinct phases of growth acceleration and deceleration. Over this period, Nakuru's urban expansion totalled approximately 180,000 hectares. The growth phases are punctuated by years of rapid spatial expansion followed by consolidation periods, where urban growth either stabilizes or slows down. This cyclical nature of growth points to a broader structural trend, where expansion is often followed by efforts to strengthen urban infrastructure, improve service delivery, and manage urban land resources more effectively.

In 2014, 2017 and 2022, the urban expansion was more pronounced, suggesting strategic periods of infrastructure development and land-use changes that facilitated larger urban growth areas. The growth spurts during these years may also be attributed to strategic investments in urban infrastructure, particularly around Nakuru City and the surrounding municipalities. These cumulative patterns, when compared with slower growth periods, reveal the necessity for sustained planning and development policies that can balance rapid urbanization with long-term sustainability and resilience goals.

5.4.3 Nakuru City Growth Pattern

Nakuru City, as the core urban centre of Nakuru County, exhibited distinctive growth patterns compared to other towns in the region. Over the observed period, Nakuru City emerged as a central hub for economic activity, prompting a rapid transformation of its urban landscape. The city's expansion was particularly evident during the significant growth periods of 2014, 2017 and 2022, where urban sprawl extended both horizontally and vertically, with new residential, commercial, and industrial zones developed to accommodate the growing population and demand for services.

*Figure 7:Nakuru City Urban Growth Yearly Percentage (Base Year 2010)*
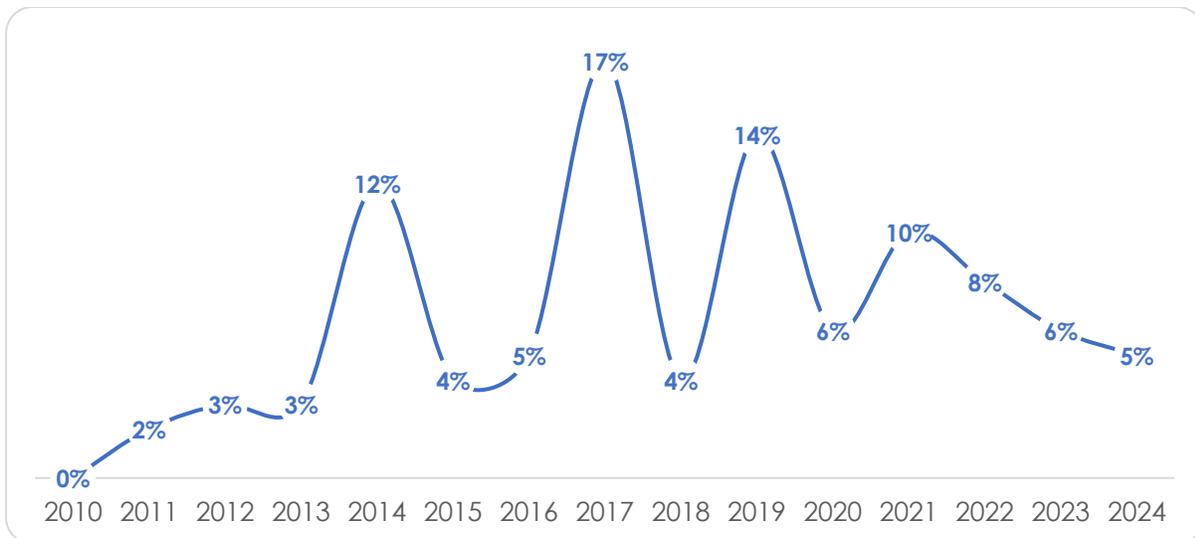
The city also faced challenges during slower growth periods, such as 2015, 2018 and 2024. These years may have been characterized by urban densification rather than sprawl. Nakuru City's growth pattern reflects the broader trend of urban areas in Kenya, where periods of rapid urbanization often necessitate strategic urban management interventions to address issues such as traffic congestion, housing shortages, and environmental degradation. Key Observations for Nakuru City

Nakuru City, while benefiting from the broader growth of Nakuru County towns, demonstrated specific characteristics in its urban expansion trajectory. The town's growth was quite significant and shows that the county urban grown depends on it reflecting a balanced urban development approach.

One of the key observations for Nakuru City is the balancing act between maintaining a semi-urban character and transitioning into a more developed urban center. The town's expansion shows that while growth was higher in comparison to other areas, it managed to avoid some of the challenges associated with rapid urbanization, such as overcrowding.
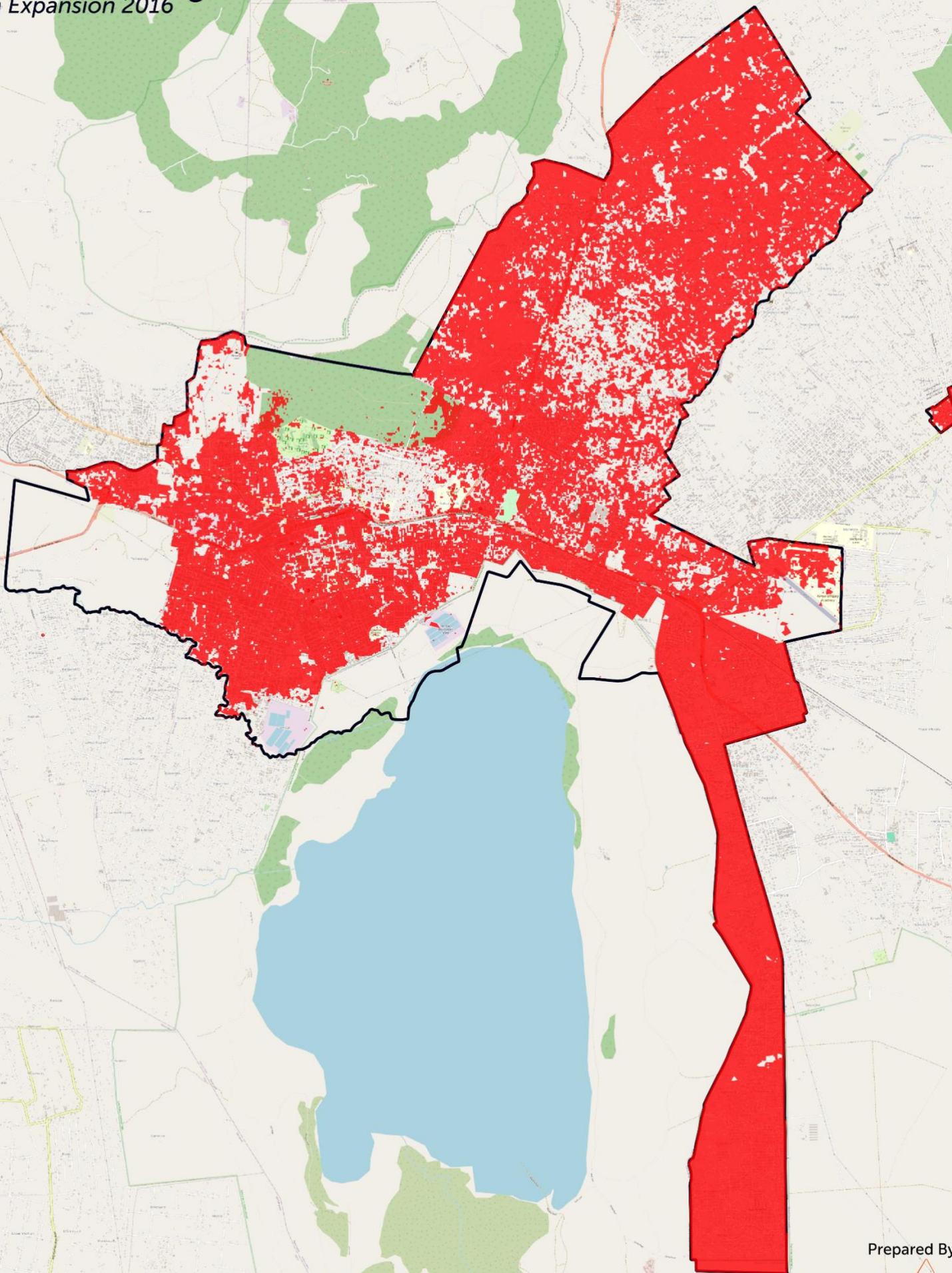
Nakuru City
Urban Expansion 2010

Prepared By

AMT.
AKIBA MASHINANI TRUST
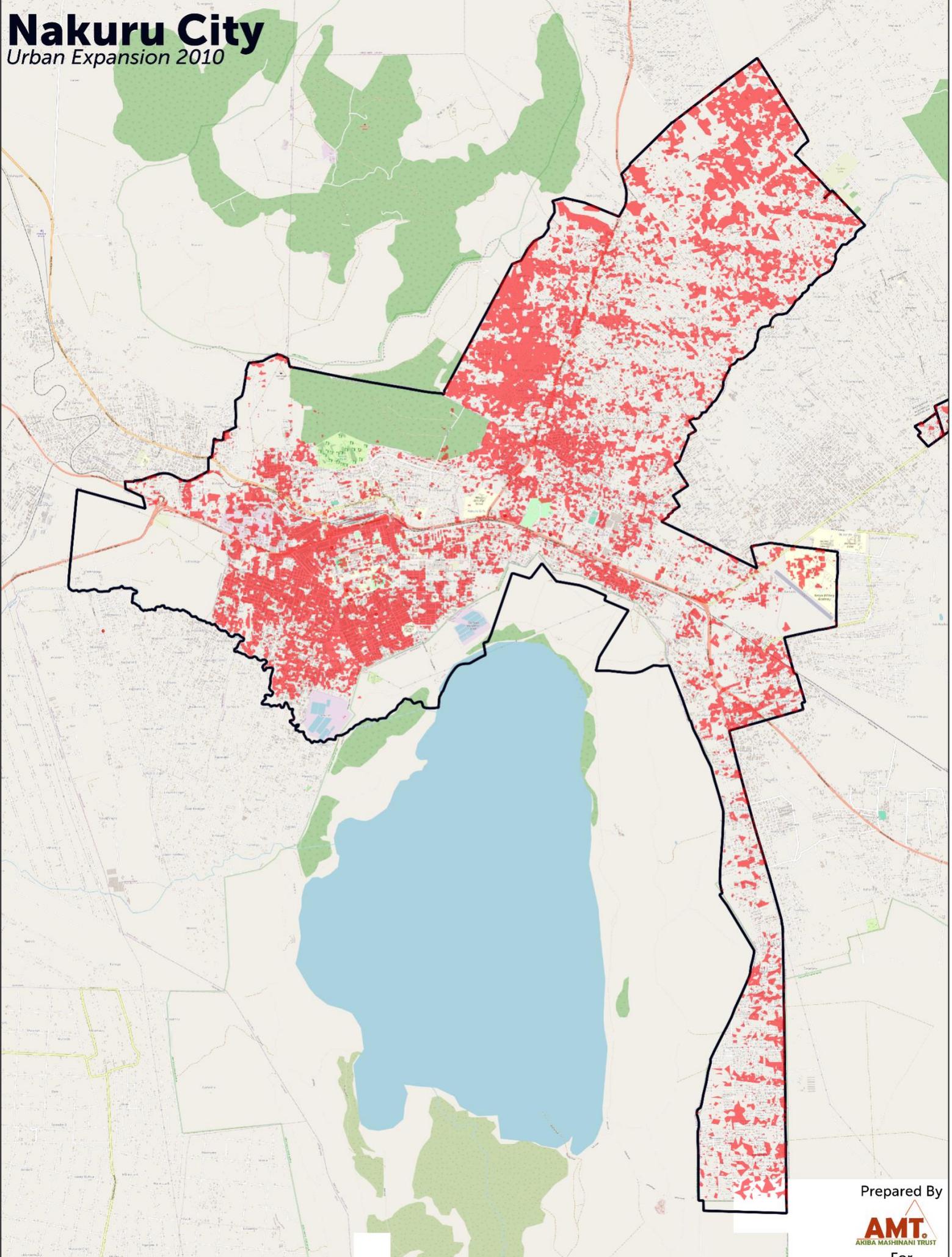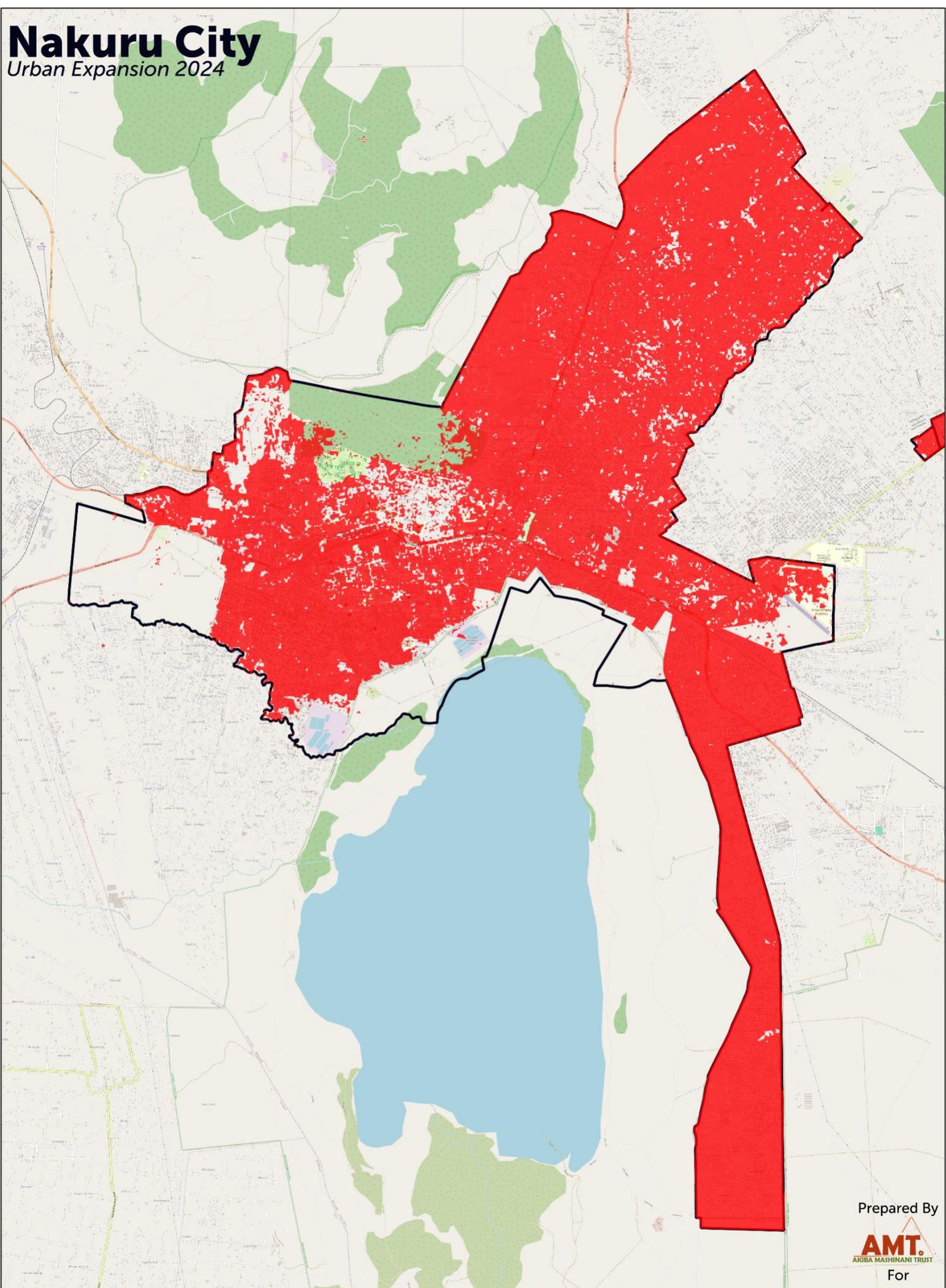
For

Nakuru City
Urban Expansion 2016

Nakuru City
Urban Expansion 2024

Prepared By

AMT.
AKIBA MASHINANI TRUST

For

Annex

The provided link contains two folders with detailed geospatial data on urban expansion and building density distribution across various towns. The Urban Expansion Maps folder documents urban growth trends from 2010 to 2024, offering both composite maps and year-specific urban extent maps. Each town has a dedicated composite map that illustrates changes in built-up areas over time, highlighting zones of significant expansion. Additionally, individual maps for 2010, 2014, 2016, 2018, and 2024 provide snapshots of urban extent at different stages, allowing for a comparative analysis of growth patterns. These maps are essential for understanding spatial development trends, identifying urbanization hotspots, and informing land-use planning.

The Sampling Density Maps folder contains building density maps for 2024, which stratify each town into three distinct zones: high-density, medium-density, and low-density areas. High-density zones represent tightly packed buildings, typically found in commercial hubs or central urban areas, while medium-density zones consist of suburban or mixed-use developments. Low-density zones, on the other hand, are sparsely built, often located on the city's outskirts or designated open spaces. These classifications are crucial for designing effective sampling strategies, ensuring that data collection efforts account for variations in urban density.

Maps of all the other urban areas in Nakuru and Analysis