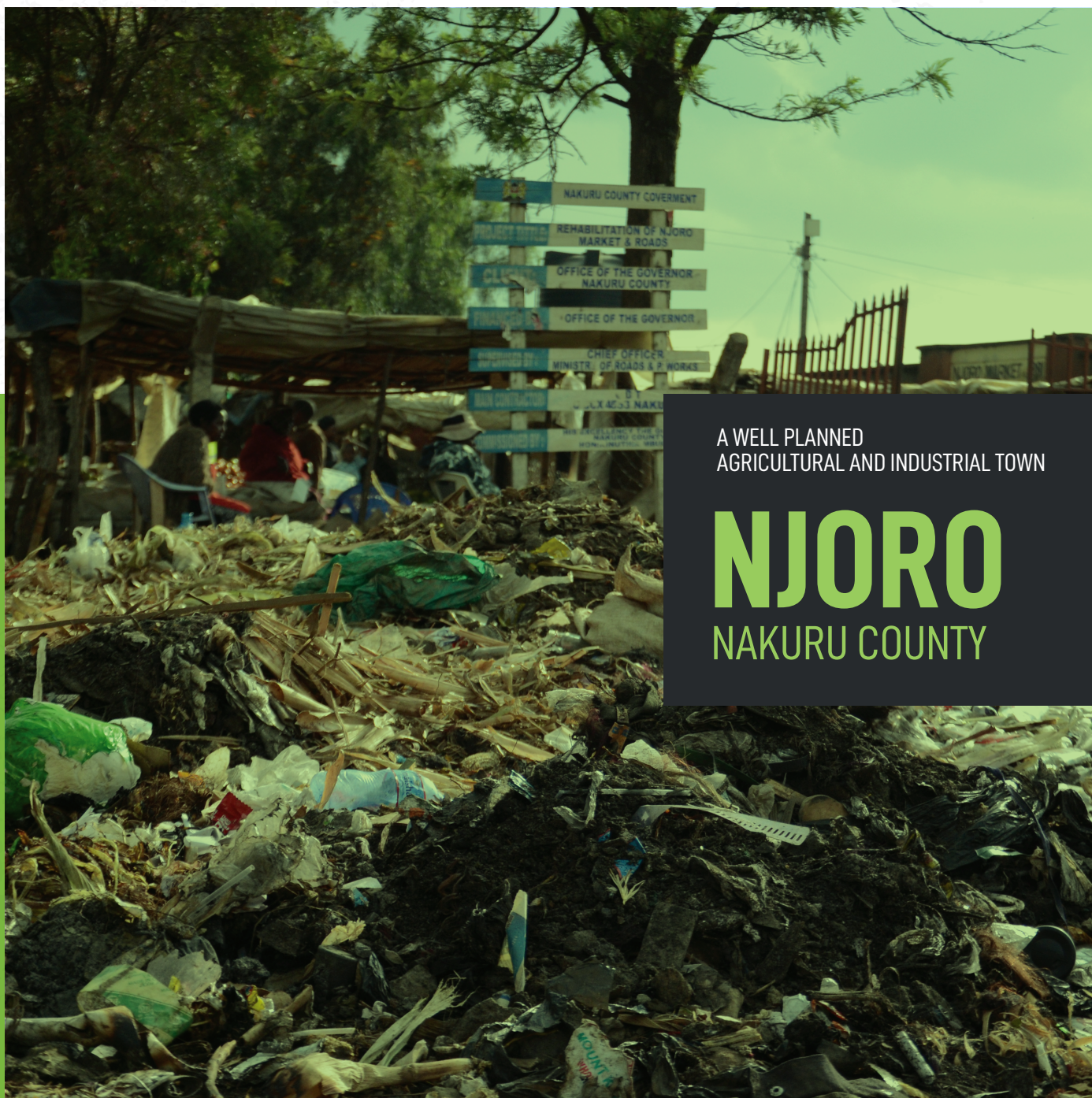




The SymbioCity Approach for Sustainable Urban Development

# URBAN SUSTAINABILITY REVIEW REPORT



A WELL PLANNED AGRICULTURAL AND INDUSTRIAL TOWN

## NJORO NAKURU COUNTY

**Cover Image:** Solid waste disposed  
outside a market in Njoro

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# Acknowledgments

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Njoro Town in Njoro Sub County was selected as the area in Nakuru County to pilot the SymbioCity approach, which is aimed at identifying opportunities to enhance sustainable urban development. The methodology applied an integrated and holistic approach to identify synergies between urban systems. As a result, this Urban Sustainability Review (USR) was conducted in accordance with the SymbioCity Approach.

The organizers of this publication are grateful for the support of the Nakuru County Government, the steering committee, the department of Land Housing and Physical Planning, the resident business people, civil servants and community leaders of Njoro town, all of whom have been very supportive and encouraging.

The people of Njoro and the entire Nakuru County wish to thank the Swedish Government through the Embassy in Kenya, the Swedish International Development Cooperation Agency (Sida), SALAR and SKL International, and the COG for the opportunity to pilot the SymbioCity approach in Njoro town.

We further recognize the excellent collaboration with the secretariat from Council of Governors who provided guidance and support. The SymbioCity Project facilitators and advisory team have been very encouraging. The advisory services, supervision, support and a guarantee of continuity in the knowledge level and the encouragement by the Urban Development specialist, Everlyne Otieno and her team helped in shaping this report not forgetting the SymbioCity Steering Committee for the overall strategic leadership.

The real champions of this publication are the Community mapping team who, under the leadership of Gilbert Nyoro helped in gathering the baseline information informing this report and Njoro Project Working Group who provided local and historical knowledge of the project area.

# Executive Summary

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The purpose of this urban sustainability assessment exercise was to determine the capacity of the county government to plan, develop and manage urban areas in a sustainable and inclusive way. The report reviews approaches and tools that are effective and useful in the local context. Njoro Town in Nakuru County was selected to pilot this approach. The pilot was aimed at identifying opportunities to enhance sustainable urban development within Njoro Sub County by conducting a Urban sustainability review (USR) in accordance with the SymbioCity Approach.

The review analyzed the current situation and the key development challenges in Njoro town as inadequate water & sanitation, poor solid waste management, poor road & transport infrastructure, dwindling culture & recreation facilities and activities and high rate of unemployment in that order. The report delved into these issues in broad and long-term sustainability angle and also in local short-term projects that could stimulate activities towards realization of the County and planning area visions.

The regions agriculture potential is under threat as a result of increased by urbanization. Egerton University was tagged as a key economic driver in the region. Its student, academia and support staff population provide market for agricultural produce thereby promoting urban-rural linkages. The capacity of the university as a research institution is a potential for agriculture value addition and chain.

Njoro's population size, its conducive climate and topography, in addition to it political and administrative units were found to be the towns' key natural resources and strengths. The slow pace in the growth of Infrastructure, housing, employment opportunities and lack of affordable credit to support agriculture value chain were found to be some of the challenges of the urban development in the region.

The analysis in conclusion proposed key sustainability strategies that can be implemented to address the myriad of challenges identified in Njoro Urban and peri-urban areas for prosperity and sustainable development.

## Chapter 1

# Introduction & Background

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Across the world, cities and towns are urbanizing at a very high rate resulting in growth of urban population and high demand for services. High population growth is putting pressure on urban infrastructure such as roads, water, sewerage and public recreational spaces among others. The situation is worse for towns in the developing world that are currently the fastest growing with very little investment in urban infrastructure, services and housing.

Njoro Town is not unique; it suffers from all these urban challenges. From a serious challenge of fresh water supply, poor solid and liquid waste management to deplorable roads and lack of non-motorized transport despite a majority of the people preferring non-motorized forms of transport due to the small size of the town. Further, the area is facing uncontrolled land subdivision of arable land leading to urban sprawl and environmental degradation. Post 2007/08 political skirmishes, the town has seen an upsurge in population as most of the people who lived in the villages migrate to the more peaceful town of Njoro. This has led to a fast rise in the growth of informal settlements and with it a high proportion of urban poor.

To mitigate the impact of these challenges, there is need to come up with solutions that tackle these changes in an integrated and sustainable approach with the local people at the centre of the process. For this reason, there is no better way to handle these problems than to use the SymbioCity approach borrowed from the Swedish Association of Local Authorities and Regions (SALAR), which offer a symbiotic/integrated approach to solving urban challenges. Njoro Town thus presents us with a pilot town where this approach can be implemented and create a process that can be replicated in other urban areas to solve their urban challenges.

## What is an Urban Sustainability Review (USR )?

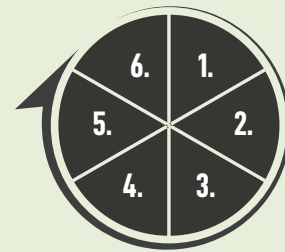
An Urban Sustainability Review is a process by which the major challenges and opportunities in the planning area is analysed as well as the product of the said process that ends up with USR report. It provides a platform that the stakeholders in the area bring out their issues for consideration and provide the best possible means of utilising the opportunities as well as tackle the challenges for posterity.

### The SymbioCity Process

The Steps in the SymbioCity Process are:

1. ORGANISING THE PROCESS
2. DIAGNOSING THE CURRENT SITUATION
3. IDENTIFYING KEY ISSUES AND SETTING OBJECTIVES
4. DEVELOPING PROPOSALS
5. ASSESSING THE IMPACTS OF PROPOSALS
6. DEVELOPING AN IMPLEMENTATION STRATEGY

The six SymbioCity process steps can also be seen as a cycle, which can be worked through in a series of iterative loops.



The SymbioCity cyclical working procedure involves three loops, each of which focuses on two steps. In each loop, it is a good idea to keep an eye on previous steps, which can often be updated and improved during subsequent steps.

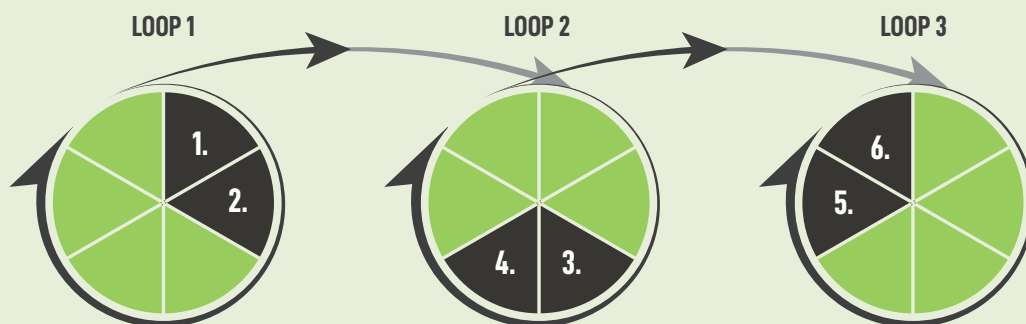


Fig. 1. The Symbiocity Loop

### About the SymbioCity Approach

SymbioCity stands for integration or mutualism. It is a sustainable urban development model that was started in Sweden and has been successfully applied in developing countries such as India, China, South Africa, and Zambia. The model is generic but can be applied flexibly in specific local areas and urban contexts. The SymbioCity model looks at urban areas holistically and attempts to show how spatial, environmental, social-cultural, and economic factors are in fact integrated and mutually supportive. The approach recognizes that urban areas are created by people for the people and, therefore, should be inclusive of all people.

The SymbioCity approach considers different functions and systems in relation to one another. It is based on three interconnected core areas:

- The conceptual model,
- The institutional factors (including policies, laws, regulations and
- Urban systems (the way in which urban areas operate, for example through transport, water and waste management systems).

### SymbioCity Kenya

The SymbioCity Kenya program is a partnership between the Swedish Association of Local Authorities and Regions (SALAR) and the Council of Governors (COG). Urban areas in Kenya are facing a range of problems whilst attempting to exploit their full potential in contributing to the growth of Kenya's Gross Domestic Product. SymbioCity Kenya provides methods and processes for developing solutions for these urban areas. As a flexible approach, it is capable of responding to local circumstances and moulding responses to the specific challenges faced in different locations – including our pilot area of Njoro. The program is being implemented through an agreement signed between SALAR, COG and pilot counties. It is supported by a technical team in Kenya and international experts on urban development, facilitators and advisors drawn from Sweden. The program works to enhance and strengthen the existing urban structures and systems. Nakuru County, having been selected as one of the seven pilot counties in Kenya, is implementing this at a Njoro town in Njoro Sub-county.

### Project Organization/Management Structure

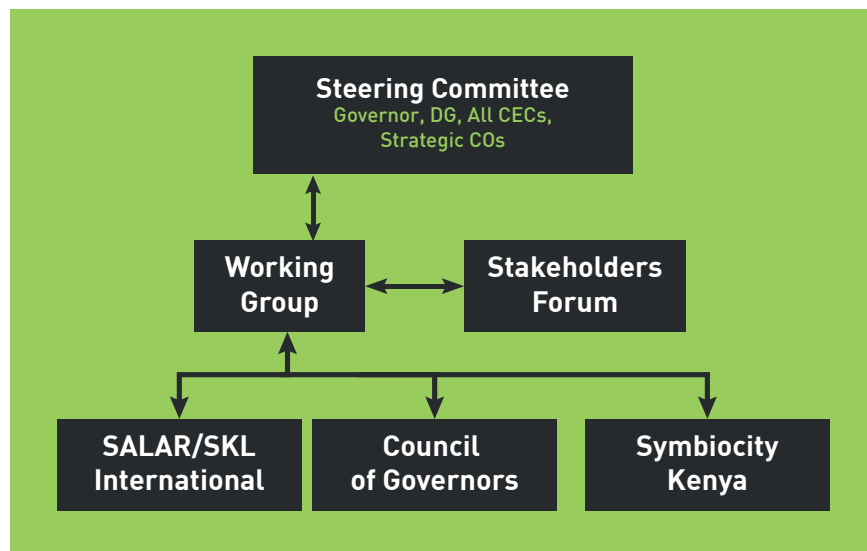


Fig. 2. Organization of SymbioCity Njoro (Source: Njoro WG)

To implement the SymbioCity approach, teams comprised of a Steering Committee (SC), Working Group (WG) and a core group that is a subset of the WG had to be set up. The steering committee is chaired by the County Secretary and has Chief Officer Land, Housing and Physical Planning as its Secretary. The SC is the ultimate decision making body at the pilot county level. The role of SC is to ensure local ownership, provision of guidance and direction on strategic matters to the WG in the course of implementation of pilot activities. The WG is comprised



of sixteen members mainly members of staff from Nakuru county and several representatives of the major stakeholders. Pilot Coordinator who is the contact person of the SymbioCity Programme in the County, heads the WG. The output of the WG is the Urban Sustainability Review report. It is the secretariat to the delivery on the SymbioCity Programme objectives. The WG conducted rigorous data collection, research and stakeholder engagement forums towards this end.

### Project Participants

The Njoro SymbioCity pilot is working with international and national facilitators, advisors and urban development specialists from the Kenya SymbioCity team and Sweden. The project is involving various stakeholders including political representatives (Member of the County Assembly), Chairman of the Land, Housing & Physical Planning Committee of the Nakuru County Assembly, both National and County government officials, local opinion leaders, the private sector, business people, Njoro open air market committee members, Faith Based Organizations (FBOs), Community Based Water Groups (CWBOs), service providers such as Nakuru Rural Water Supply And Sanitation Company (NARUWASCO), transport providers, Egerton University, Kenya Agricultural & Livestock Research Organization (KALRO-Njoro), Kenya Forest Service, Njoro River Community Association, Police and Ngondu Environmental Group-Egerton,



Fig. 3. A project structures and cooperation network, including both internal and external stakeholder groups

## Purpose and Objective for Conducting the Urban Sustainability Review

Accurate and up-to-date Information has been recognized as the most critical input for urban planning, development strategies and decentralized governance. Trying to access reliable and relevant information on urban development issues in a town like Njoro is close to impossible for most inhabitants of this town and for many development partners as well. Consequently, community participation in urban planning and policy making has remained almost non-existent and there is a strong feeling among residents and community based organizations of being marginalized by the local authorities.

Additionally, when information on urban development issues is available it is usually so erratic that the authorities' decision-making often brings about short-termed and inconsequential strategies. The situation is further complicated by the rapid and unrecorded changes taking place in the urban setting, which severely affect the capacity of local authorities in dealing with adequate provision of basic services, information management and sustainable urban development strategies and control.

In such a context the availing—to planners, decision-makers and to the community – of timely, accurate and relevant information on urban development issues could be of great help in improving public participation as well as informed decision-making in urban development initiatives through this USR.

The USR further serves the following purposes namely:

- To establish the challenges being faced by Njoro town community
- To establish the strengths of the town as a potential city
- To establish the opportunities present for sustainable growth of Njoro town
- To establish the threats faced during sustainable development of Njoro town
- To develop the vision, objectives and strategies for addressing the challenges & guide Njoro towns' growth and
- To propose possible actions to ensure a sustainable urban development process.

In an attempt to contribute to the above, Njoro SymbioCity Working Group further in partnership with the County Department of Planning and with financial support from COG, initiated a community participatory resource mapping and data collection Project. The project team undertook a community mapping exercise in June 2017 and mapped 25 layers of information identified by the stakeholders as important in the implementation of the SymbioCity pilot project. Some of this data has been used extensively to inform this report.

## Stakeholder Mapping

Njoro SymbioCity Project							
Stakeholder Mapping							
	Criteria	Group	Potential Stakeholders				Total
1	Stakeholders with strong legitimacy	Technical Committee	LHPP Department	Physical Planner	Sub County Administration	Sub County Sector Heads	
			4	1	1	7	13
2	Stakeholders with control over essential resources	Community Working Group	Land Owners' and Farmers' Associations	Water Users' Associations	Knowledge & Research Centres	Member of County Assembly	
			2	2	2	1	7
3	Strongly networked stakeholders		Manufacturers & Business Associations	Transport and PSV Associations	Urban CSO	Landlords Association	
			2	2	2	2	8
	Total						28

Table. 1. Stakeholder Mapping

## Chapter 2

# Njoro Today

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### Brief introduction to the city

Njoro is a medium sized Sub County covering an area of about 780 Km<sup>2</sup>. It is the headquarters of Njoro Sub County located 18 km south west of Nakuru Town. With an average altitude of 2400 meters, Njoro lies between Longitude 35° 45"0 and 36° 10" 0 East and Latitude 0° 15"0 and 0° 42"30 south. It enjoys a warm and temperate climate.



Njoro has a fascinating topography and a diversity of geographical and ecological features; to the East is Lake Nakuru National Park, a wetland of global significance; to the south and to the West is the Mau Catchment, a water tower of regional significance; to the North is the dormant 12 km wide Menengai Crater, one of the largest craters in the world after the Ngorongoro Crater in Tanzania.

Njoro town is well connected to neighbouring Counties by a good communication network. The Trans-African highway and the East African Railway though inactive pass through the town. The sub county is home to museums with an extensive and interesting history on human evolution, tales of battle and love, worship and adventure, quite beautiful and shrouded with tales and folklore. Tourist attractions include a rich diversity of flora and fauna, stunning landscapes and sceneries, such as the western view of Menengai Crater.

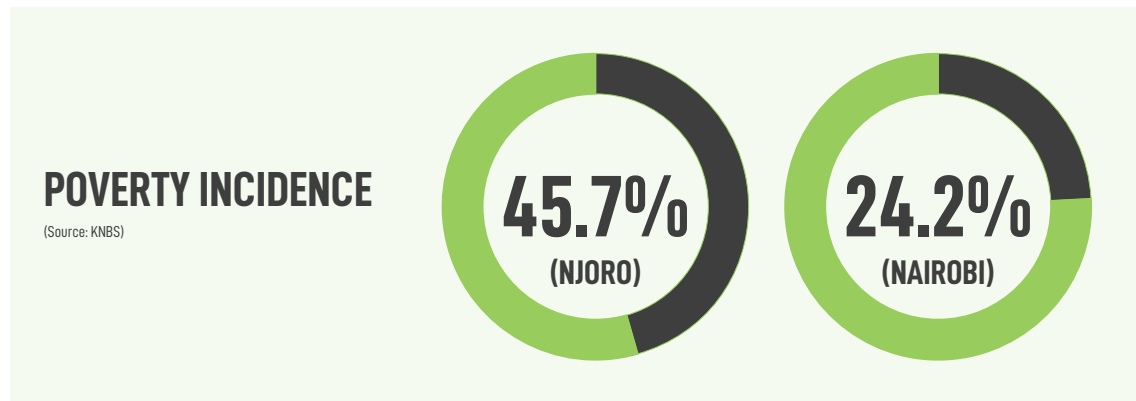
Njoro has grown to be an agricultural research Centre, development and education. It is a home to one of the largest Agricultural and Livestock Research Institute and Egerton University situated 5 km south of the Market center. The rural landscape is characterized by large-scale land holdings. Barley and wheat farming, dairy, horticulture and vegetable production are the main economic activities in the region. Timber milling factories, some dormant, dot the periphery of the town. The Mau forest is one of the key environment assets for the Sub County. The size of gazetted forest in Njoro is about 885 km<sup>2</sup>.

Njoro town was first settled by the Maasai-speaking people before the arrival of British settlers to the Kenya highlands. Njoro town serves as the headquarters of Njoro Sub County as well as the commercial centre for the sub county where people access lower level commercial and administrative services. Over the years the town has grown to be an important centre in agricultural research, education and development. The town is home to a campus of the Kenya Agricultural and Livestock Research Organisation (KARLO) and Egerton University is situated 5 km south of the town centre.

The town is cosmopolitan although the Kikuyu is the predominant community, and thus have greatly influenced the culture of the area. This region of Kenya receives less than 100 cm of rainfall per year thus classified as Semi-Arid Land (SAL). There are few rivers, which are highly polluted while some of them dry up during severe drought. Groundwater in the form of wells and boreholes constitute the main source of drinking water..

The economic growth of the town has been slowed due to its proximity to Nakuru Town. Tourism has a minor but important role in the local economy. The town is part of the south Rift tourist circuit as it is on the way to the famed Masai Mara National Park. Tourists can visit the Lord Maurice Tatton castle, which is run and maintained as a visitor and conference centre by Egerton University.

## Poverty Incidence



The 2009 population census approximates the population of Njoro ward to be 52,289. The poverty incidence of the ward is approximated at 45.7% of individuals living below the poverty line. This indicates that the total consumption expenditure of a large population in the Ward is Kshs 50 per day. This means that the population cannot get access to basic basket of goods and services to sustain them for a day. The high poverty incidence in the ward can be attributed to the following factors:

- **Climate change:** Change in climate and weather patterns negatively impact farming activities. Unpredictable weather leads to increased drought frequency, drying up of river beds hence causing reduction in agricultural output which affects the lives of the larger population who depend mostly on agriculture as a source of income. As a result, serious inflation issues arise making food commodities expensive for most and also diminishing incomes for households.
- **Lack of access to markets:** Poor infrastructure, poor productivity, limited education or insufficient information limit access to commodity, credit, financial and labor markets. These lead to undiversified economies dependent on agriculture and trade, thus low income levels leading to both income and food insecurity.
- **Unemployment:** Unemployment is closely related and followed by poverty. High levels of poverty in the ward mean high dependency ratios for households. Coupled with diminishing incomes, poverty incidence is bound to rise in the ward.

## Spatial dimensions

### Size

The SymbioCity program is being piloted in the northern part of Njoro Sub County in Njoro Ward. Njoro ward is the most affluent of the Six Wards in the Sub County and serves as its commercial headquarter. The project area measures about 23Km<sup>2</sup> covering the urban area that includes Bondeni market and Posta trading centre, it extends to Precious Secondary school to the North, Abma Farm to the South, Faith Holy secondary school to the West and Bright Girls High school to the East.

Njoro presents an outward radial growth from Bondeni and Posta towards the exterior. An area image below shows that the urban structure has adopted what appears as series of rings, each ring presenting a different set of density. The innermost ring represents the central

business district with a dense cover of development. Grocery and vegetable shops, eating and beer houses, fabrication, joinery and repair shops, petrol stations, transport vehicles, public service vehicles and motorcycle parking yards occupy the core of this ring. Central government divisional headquarters and County Government offices are also within this ring.

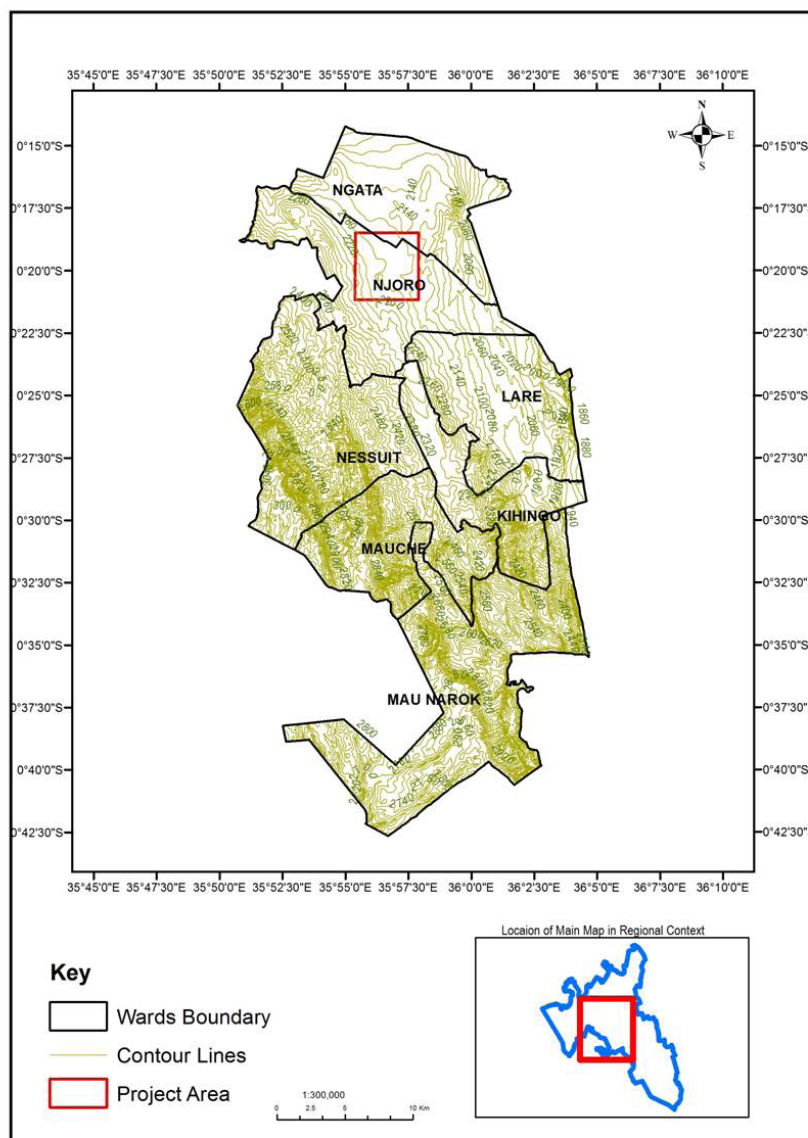
In the second ring are residential areas. This ring is characterized by congested poor quality housing estates. These estates include Ndege, Jua Kali Industrial Area, Jewathu and Kariobangi all of which present informal housing characteristic. The third ring contains residential homes and rental housing and is dominated by the middle-income class. Baraka, Bondeni, Golf, Contractors, Majangwa, Huruma, Jordan, Teachers and Umoja make this ring.



An aerial map of the project area

## Topography

Njoro Sub County has a total surface area of approximately 780 km<sup>2</sup>. The lowest altitude is 1,780 and the highest is 3,060 metres. The highest elevation of 3000 to 3,060 meter is to be found in Nessuit forest. The lowest altitude of between 1,780 and 1,980 is in Lare Ward along the Lake Nakuru National park boundary. Njoro town has an average altitude of 2,400 meters.

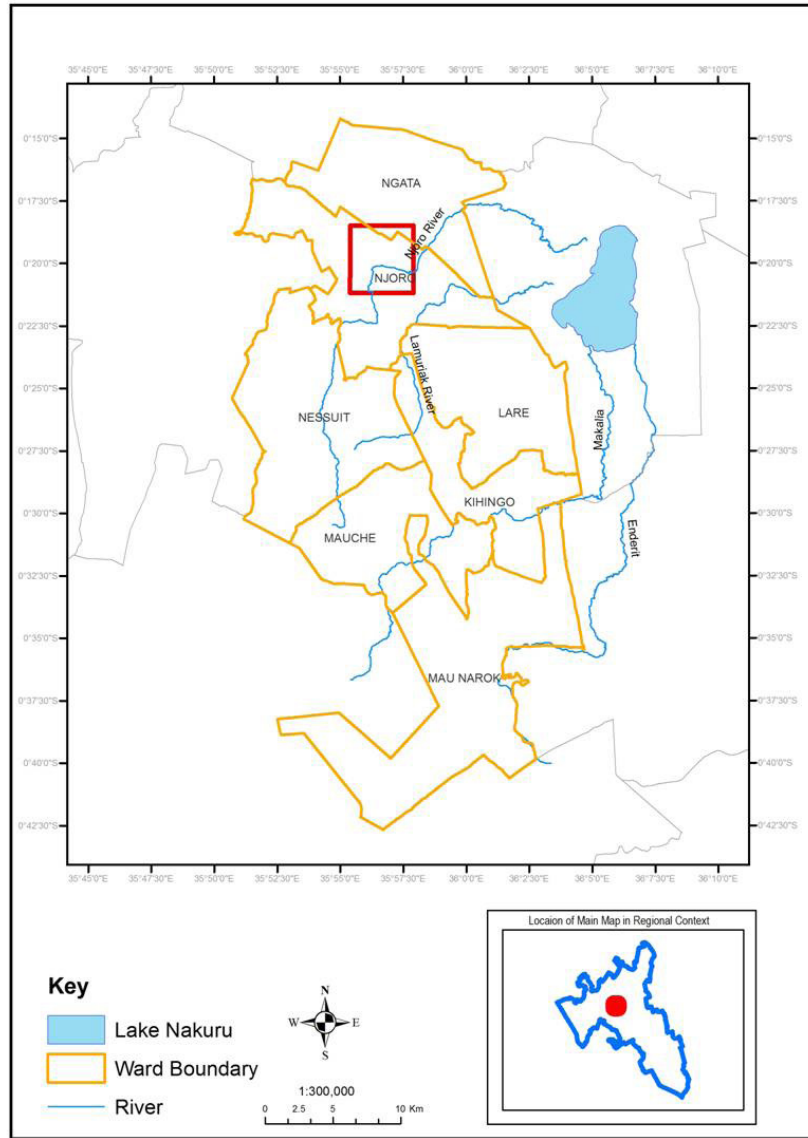


A map showing the topography of the area

## Drainage

The drainage pattern in Njoro due to its terrain and location leads to Lake Nakuru. As a result, all the surface run-off finds its way to the rivers and eventually to the lake leaving the area degraded as a result of loss of ground cover in the area and dry. There is need to take advantage of the ground characteristics in Njoro and tap this resource source to replenish ground water and provide the area with water for domestic use and agriculture.





A map showing the surface water run off to Lake Nakuru

## Roads

Njoro town is well connected to urban centers and to neighboring County and Sub counties by a good network of roads mainly the Class 'C' category offering business potential to the region. The C57 connects Njoro to Elburgon and Molo and to the Trans African Highway and to Nakuru town and to the wheat-rich fields of Narok County. It is estimated that the Sub County has a total of 1,265 km of roads. Of this 85km (6%) is bitumen surface, 660 Km is murrum and 520km is earth tracks. All the Wards in the Sub County apart from Njoro could be categorized as rural and are characterized by limited accessibility due to poor road surface.

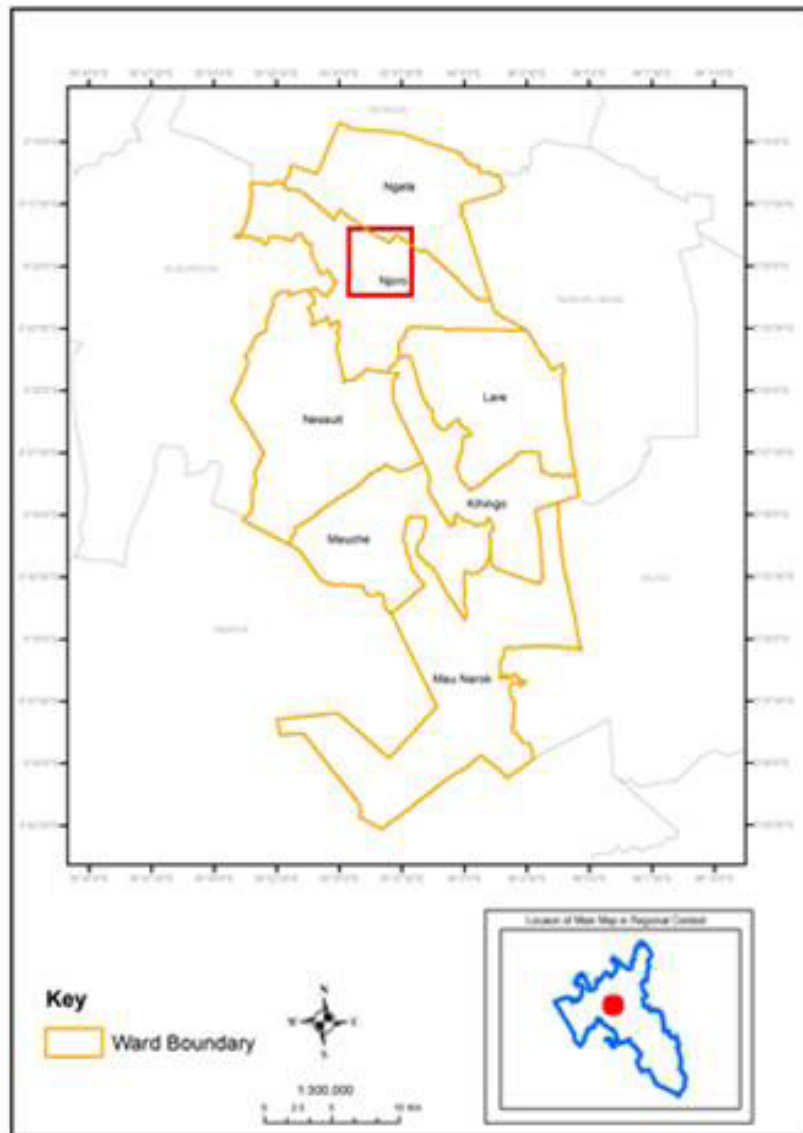


## Urban governance: Institutional factors

### Political and Administrative Units

The Sub County is divided into six (6) Wards - Njoro, Lare, Kihingo, Mauche, Nessuit, Mau-Narok. Administratively, the Sub County is divided into four divisions, - Njoro, Lare, Kihingo, Mauche and Mau-Narok; nine (9) locations. Bagaria, Gichobo, Lare, Naishi, Kapkembu, Teret, Tuiyotich, Mauche, Mau Narok, Sururu, Kihingo, Nessuit and Njoro and some 27 sublocations. Wards are the lowest planning unit and Sub location are the lowest administrative units.

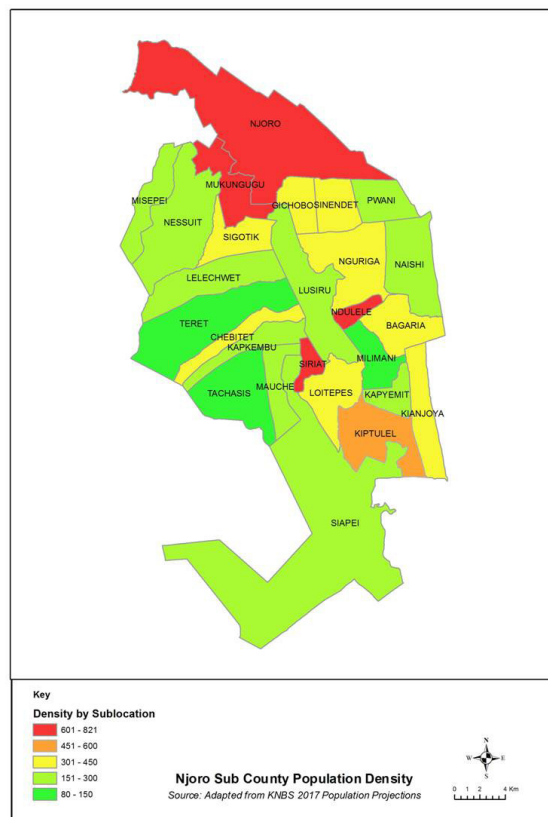
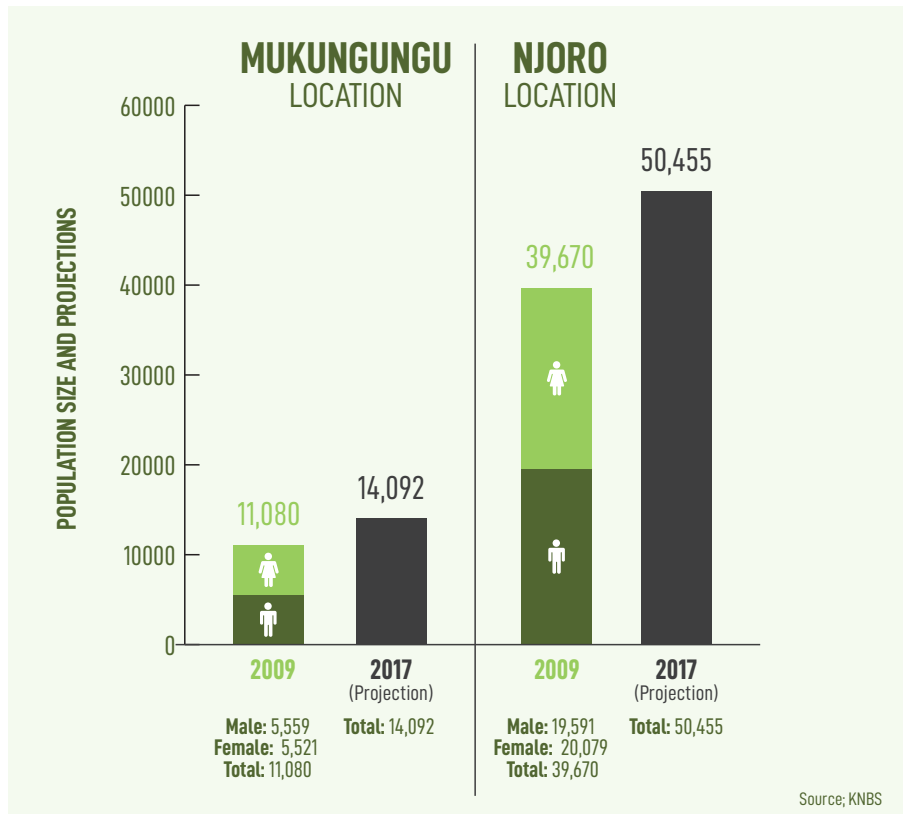
Out of the six Wards, five are rural and are characterized by scattered settlements, poor housing, limited accessibility and low population density; slow pace of development and overall prevalence of poor infrastructure. Until recently, Njoro area was the only market centre in the region with urban characteristics. Egerton College Centre is quickly taking an urban shape and will soon be a major economic hub.



## The Human City: Socio-cultural dimensions

### Population

Njoro sub County covers about 10% of Nakuru County's land surface. According to the 2009 population census, it accounted for approximately 11% of the County's population of 1,603,325. The Sub County experiences high rates of immigration and migration leading to increase in population especially in Njoro town. KNBS projected the population will grow at an annual rate of 3.05 % percent and will rise from 180,189 to 226,627 inhabitants in 2017. This sharp growth of population in this up-coming urban center calls for improved urban planning, better housing, enhanced security, more water and better sanitation; more social amenities such as schools, health and recreational facilities, social halls and sports fields.



## Urban Rural Linkages

Nakuru County is among the most important economic centres in Kenya with dynamic agribusiness activities in its hinterland; Njoro forms one of the hinterlands. It is characterised by a diversified agriculture based regional economy. Small urban centres along the southern transport corridor offer markets and services for local agricultural producers for local populations and for Njoro and Nakuru towns.

There is a strong relationship between urban and rural populations. Availability of land, transportation, communication and energy has created a strong urban-rural linkage. Ease of mobility and improved agricultural productivity in the rural areas and access to employment and markets in the urban areas has strengthened rural urban linkages in the region.

In the periphery of the town, Egerton University College and Kenya Agriculture & Livestock Research Organization have contributed highly to a circular mobility of people in exchange of services and goods.

Urban-rural linkages are rife in the region. Forests, livestock and wheat farming offer employment to rural folks and raw materials to factories and food processing plants in the urban area. Workers in the horticulture sector support real estate development. Finished products are brought back to the rural communities for use and consumption.

However, relationships or inter-linkages between urban and rural areas are not all positive or beneficial to both ends of the spectrum. Urban center extensions have absorbed productive agricultural land, exploited water resources, polluted rural environments and become sinks for urban waste. Construction in these areas hardly expands vertically, but horizontally. Thus, encroachment on fertile agricultural land is an obvious consequence of this development.

The negative issue with urban-rural linkages in Njoro relate to disparities in the socio-economic characteristics of peri-urban and rural communities. These residents suffer poor infrastructure and experience inequity in service provision and access to basic services. Ultimately, these disparities give rise to urban slums.

It was expected that the devolved system of government in Kenya would play a more significant role in rural development. This has not happened in a significant way yet. Rapid urbanization in this region is inevitable and the capacity of the local authority to address this phenomenon is insufficient. Technical capacity of Planning and Development Control officers need to be improved and the financial resources need to be distributed more equitably.

Alternative development approaches with emphasize on policies supporting rural development and food security need to be considered to better manage these urban-rural linkages.

## Urban Safety

Crime prevalence in Njoro urban is very low compared to other towns like Nakuru and Naivasha. There is a Divisional Police Headquarters in the CBD boosting the security situation in the planning area. However, the town lacks a fire fighting department despite its many timber processing factories which presents a high vulnerability to fire outbreaks. In addition, there is no disaster response unit in the area further complicating the safety situation in the area. The road infrastructure and design contribution to safety in Njoro is wanting. The roads lack

street lighting infrastructure compromising the security of the locals at night. Further, the road design does not cater for provision of non-motorized transport corridors forcing pedestrians to compete for the same carriage way with the vehicles and motor cycles. The drainage system available in the town is open further putting the safety of the residents at risk.

While pollution may be relatively low in our planning area compared to other towns, the companies, educational institutions present and the degraded environment offer their fair share of the vice. The companies especially the timber processing factories emit a lot smoke to the environment while others discharge their liquid waste into the water bodies. Egerton University in this case is guilty of discharged its sewerage waste into River Ndarugu and the countless pit latrines contaminates ground water. These activities highly influence the level of urban safety since its more than just crime.

## The Green City: Environmental dimensions

### Urban Greenery

As urban areas continue to grow, there is need to improve them making them healthier for people by simply increasing greenery. Njoro area does not fair so badly in terms of urban green spaces as shown by the map below, however, match needs to be done to increase parks, trees (with most ageing and degrading of the soil cover) and rooftop gardens and greenery of buildings in the future. These actions could go a long way towards decreasing city pollution as well as helping protect local plants and animals. With urban population expected to rise in the years to come, with the corresponding areas that the urban area will take up, there is need to enhance greening and conserving the available green spaces.

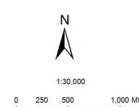


#### Njoro SymbioCity Project

##### Tree cover and Green Spaces

Data source: GeoMap Aerial Image 2015  
and Community Mapping Exercise 2017

Key	
	Trees
	Thicket
	Public Green Spaces
	Institutional Green Spaces
	Market Centre





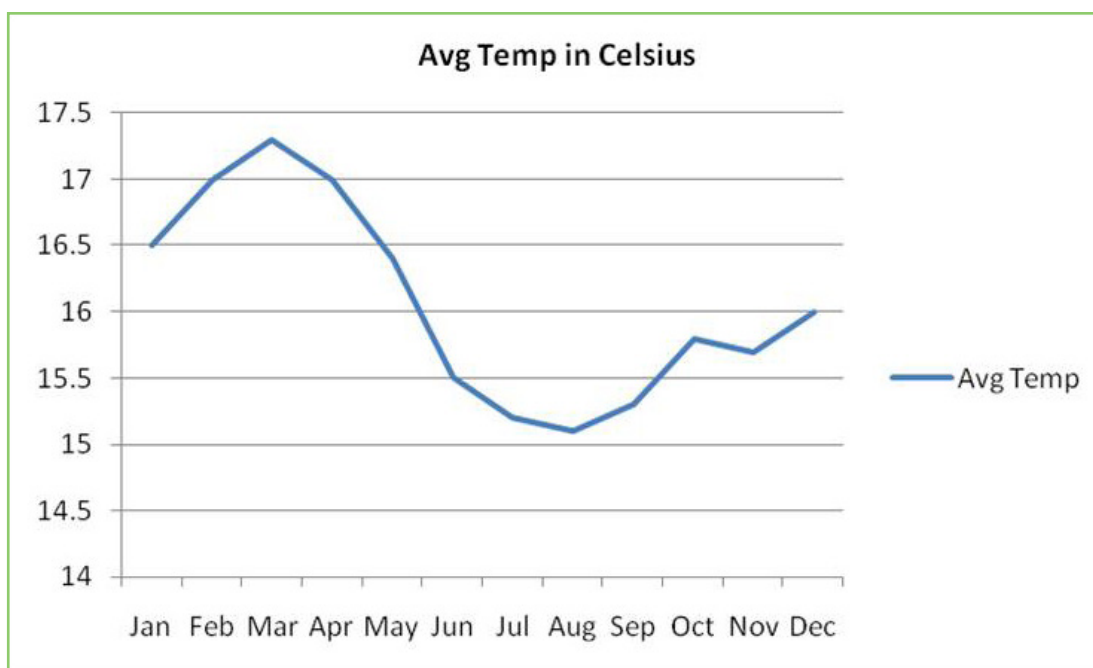
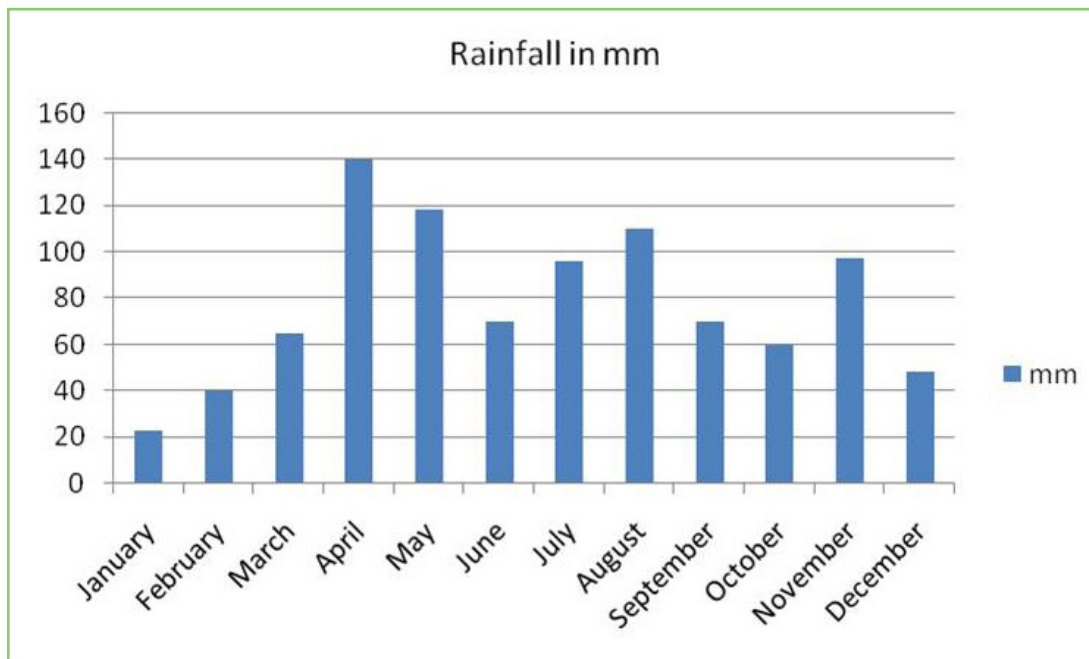
Old trees in Njoro with roots exposed as a result of ground degradation

### Climate

Njoro's climate could be classified as warm and temperate. Annual rainfall averages 937 mm. The least amount of rainfall occurs in January. The average in this month is 20 mm. Most of the precipitation falls in April, averaging 140 mm.

There are two rainfall seasons - long and short rains. The short rains yield on average 423 mm while the long rains yield 337 mm

The temperatures are highest on average in March, at around 17.3 °C. August is the coldest month, with temperatures averaging 15.1 °C.



### Forest economy and rehabilitation

The Mau forest is one of the key environment assets for the Njoro area. The size of gazetted forest in Njoro is about 885 km<sup>2</sup>. These forests are in Siapiei, Mau Narok. The Mau Forest Complex is one of the five major water towers of Kenya. Forest products include timber, poles and fuel wood. Revenue earned from the forest sub-sector by saw-mill and timber companies is around Kshs. 8 billion per year through sustainable and regulated exploitation. More importantly, this forest covers one of the main water towers in Kenya. The Mau Forest Complex water tower currently shows sharply declining levels of water release. This has been attributed to global warming,



aggravated by wanton deforestation. Many farmers, community groups and private initiatives have initiated several tree planting schemes across the Mau Forest.

The County Government has a mandate to manage land use and control timber trade through licensing. Those are two important functions, complementary to the forest management role of the State. The Council has the mechanisms in place to help in the formation of community groups, through its Social Services Department. Already five tree planting community groups have received support from the Council. The Council would welcome more partnerships to support forest rehabilitation, to in the end improve welfare and reduce poverty.

### Rivers

Rivers Makalia, Enderit, Lamariak and Njoro River are the largest rivers in the Sub County. They all originate from the Mau forest to the South of Njoro town each one of them travelling over 50 kms to drain into the Lake Nakuru.

Over population by people and livestock on the river's basin cause great damages to the water bodies which hold the key to survival of the famed Lake Nakuru. Deforestation and removal of permanent vegetation cover around the river and excessive pollution threaten the viability of these rivers. Efforts by many CBOs to avert this catastrophe are yet to bear fruits. It is doubtful if short term non-strategic intervention will address the challenges of the Mau complex.

Njoro River is the main source of domestic, industrial, and agricultural needs for water. Encroachments of the river by residents of Kariobangi slums and others along the banks are an obvious threat to this water body. There is an urgent need to include management and preservation of water bodies into the County Government's & National Environmental Management Board to protect the river for sustainable livelihoods.

## The Urban Economy: Economic dimensions

### Agriculture and Livestock

Commercial agriculture is practiced in Njoro and Mau Narok Locations and to a small extent Mauche. Wheat, barley, maize, vegetables and cut flowers are the main cash crops produced. Food crops grown in the Njoro area include Irish potato, peas, carrots, cabbages, and wheat. This produce is mostly sold in Nakuru and Nairobi for domestic consumption or industrial processing. Njoro Canning Factory is the only one agro processing establishment that buys mainly vegetables from the people of Njoro.

Cattle, sheep and goat rearing are major occupations in the semi-arid areas of Lare and Ngata popular with ranching. Moderate altitude regions of the Sub County are popular for large and small-scale dairy production. Milk collection centres are found in Njoro. However, small-scale dairy farming is common in Njoro. The milk is sold to large-scale milk processors who have their dairy plants outside Njoro. A dairy processing plant operated by Egerton University used to process milk but it has not been in operation since the year 2013.

Horticulture, especially flower farming is one of the fastest growing activities in Njoro. New farms continue to be established, each one of them easily providing direct employment to 250 to 1,000 people – and causing unprecedented immigration in Njoro. The diversity and success of agriculture in Njoro is underscored by the presence of Suswa horse-breeding Farm.

Decrease of prime agriculture land, Infertile soils, poor food distribution network, changing food habits and increased demand for white meat has given rise to urban agriculture which is emerging as an important food security and poverty reduction option. Green houses, rearing chicken and small ruminants are turning to activities of choice among Njoro urban dwellers. An increasing number of farmer households are returning to dairy business owing to the increased demand for milk by immigrants working in the horticulture sector. Small landholders are organized in cooperative societies through which they sell their farm produce while others sell direct to the consumers and hoteliers in the town. This segment of high value product farming could be enhanced by value addition to agri-products and the uptake of marketing technology by local farmers.

Agriculture in Njoro further faces a number of challenges, which negatively impacts on the returns that the farmers earn in every production cycle. These challenges include dependence on rain fed farming and impassable roads during the rainy seasons. The County Government of Nakuru has put a lot of effort to open the rural access roads although the budget has not been enough.

A production glut also affects Njoro leading to wastage and low prices for agricultural produce. This has been worsened by lack of cooling facilities to enable farmers preserve their produce and sell them during the dry spell. With all the challenges and opportunities faced by players in the agricultural sector, it is worth noting that there is a lot of potential that is yet to be exploited.

### **Egerton Training and Research Center**

Lord Maurice Egerton of Tatton, a British National who donated some 4,000 acres of land to be used to build an agricultural school to train white settler farmers who had come to Kenya after the First World War, founded Egerton university in 1939.

In 1950, the school was upgraded to a college and in 1986 the college was gazetted as a constituent college of University of Nairobi. In 1987, Egerton was fully established as a University through an Act of Parliament. As a university, Egerton is less than 35 years but it has been a training institution for students of agriculture, forestry and range management since 1950s. Since the upgrade to university status, research in the genetic resources of indigenous crops and conservation of biological resources has expanded considerably. The institution's farm covers an area of 446 ha. Research plots, botanical gardens and demonstration plots cover 45 ha and arable land 303 ha.

### **Manufacturing (lumbering, milling, agricultural industries)**

Njoro host a number of medium industries that consumes raw materials produced locally or from neighbouring sub counties such as Rongai and, Kuresoi and Molo. These industries include lumbering, milling and processing of agricultural produce. These industrial activities also play a key role offering employment opportunities both directly and indirectly to the people of Njoro. Manufacturing activities include timber processing, canning and processing of livestock feeds.

**Informal economy**

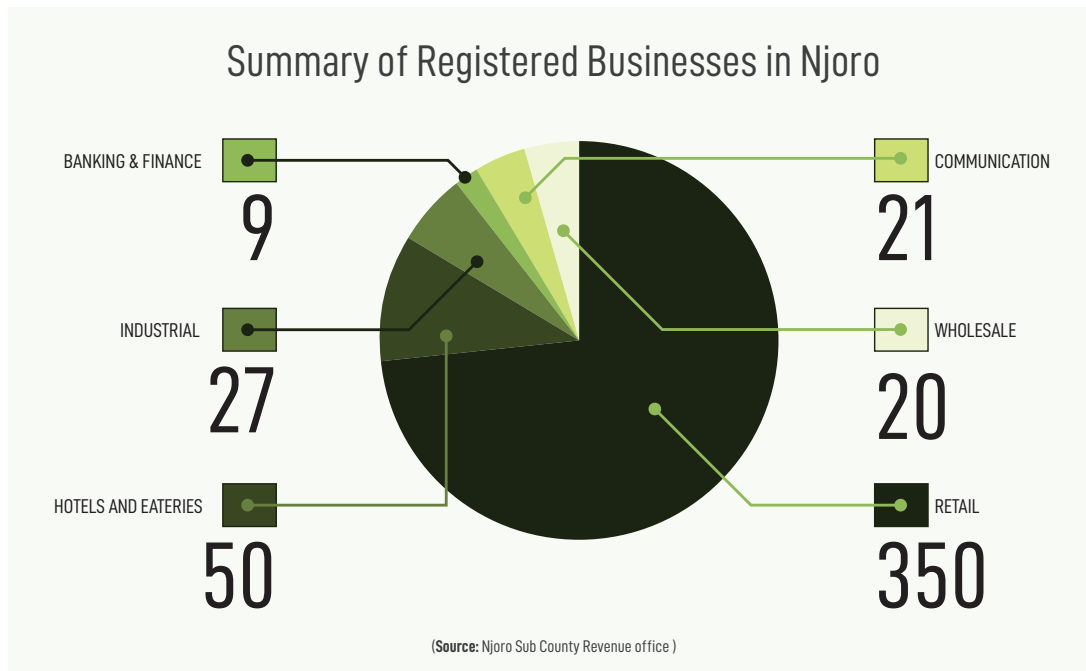
Njoro has a huge informal economy with at least 80 per cent of people working in the informal business sector. These informal business activities are based in the open air market, street hawking and public transport mainly BodaBoda.



*Informal businesses rife along the Njoro main roads*

**Summary of Registered Businesses in Njoro**

The chart below gives a summary of business activities in Njoro town;



### Shops, Restaurants and Hotels

These are mainly retail activities that serve the residents of Njoro. The sub county revenue office reported that there are 207 retail shops registered within Njoro town. These shops are a source of employment and livelihoods to the operators.

### Banking

The close proximity of Njoro to Nakuru town has negatively impacted on investment by banks. This has made the banks to only install automated teller machines (ATM) except for Kenya Commercial Bank, which has a fully-fledged branch with another operational unit at Egerton University Main Campus.

### Markets

The County Government has a mandate to manage market activities within Njoro. The markets that exist include the closed and open air market, which are adjacent to one another. It is worth noting that this markets are a major source of employment to the disadvantaged groups mainly women. The markets are also a major source of fresh produce to the people of Njoro.

### Tourism

Nakuru is dotted with museums an extensive and interesting history on human evolution, tales of battle and love, murder, worship and adventure. Tourist attractions include a rich diversity of flora and fauna, stunning landscapes and sceneries, such as the view of Menengai Crater, wildlife camp-sites in Njoro, inside Lake Nakuru National Park and range-lands. The area is home to human ancestry dating up to a few million years back. There are a number of very interesting museums and pre-historic sites with well documented permanent expositions on this theme.

### Museums

*Lord Egerton Castle - a monument of Love*

Some 14 kilometres from Nakuru town (on the Nakuru-Eldoret highway) amidst thicket of shrubs and tall equatorial canopy trees, lays a mansion, magnificent as well as fascinating in its architecture. This is the Lord Egerton's castle. It was completed in 1952, coming through a cold reality that the purpose for which it was built had fizzled out. Lord Maurice Egerton Tatton started building a 53-roomed castle

in 1938 for a lady to whom he wished to become engaged. As the story goes, the lady refused to marry him, twice, even after he built her the castle which sits on a 100-acre piece of land. She said it was a museum, leading to Egerton's heart break and move on to hate women in his entire life.



### *Njoro River Cave*

The Njoro River Cave is undoubtedly among the most interesting Late Stone Age sites discovered in East Africa. Besides its uniqueness as a crematorium, it has provided the finest series of stone bowls, pestles, and grindstones and the most interesting collection of over 800 beads and some pendants. Beads from other East African sites are very rare and are generally thought to have been imported, but the large number found at Njoro, combined with the fact that all materials used for their manufacture exist in Kenya makes it probable that these were made locally. The site, excavated by the Leakeys in 1938, consists of a large rock shelter from which a low cave extends in a westerly direction roughly parallel with the Njoro River.



Njoro Caves used as a sacred place



A water fall next to Njoro caves

### *Lake Nakuru National Park*

The park is a major tourist attraction with up to 300,000 foreign and local visitors per year. Within the park, the immediate land around the lake is exclusively used for wildlife conservation much of which is found in Njoro. The lake is world famous for its spectacular concentrations of flamingos, which depend on the lake's ecological stability for their food. The foundation of the lakes simple food chains is the *Spirulina platensis*, which is greatly influenced by Njoro River - the only surface river draining into Lake Nakuru.

Lake Nakuru was designated as Kenya's Ramsar site in 1990. The international Ramsar Convention of 1989 was established for the protection of unique and important wetlands around the world. It is home to five globally threatened species and a sanctuary for Black Rhinoceros and the Square-lipped (white) Rhinoceros. Njoro area is an important partner in the management of the park as it hosts the lakes largest watershed whose negative impact could directly affect the lake.

The Kenya Wildlife Service has partnered with Community Based organizations in the river catchment areas in Njoro such as Njocomah Tree Nursery and Fish Ponds to improve urban environmental standards and to encourage sustainable land-use in the water catchment location.

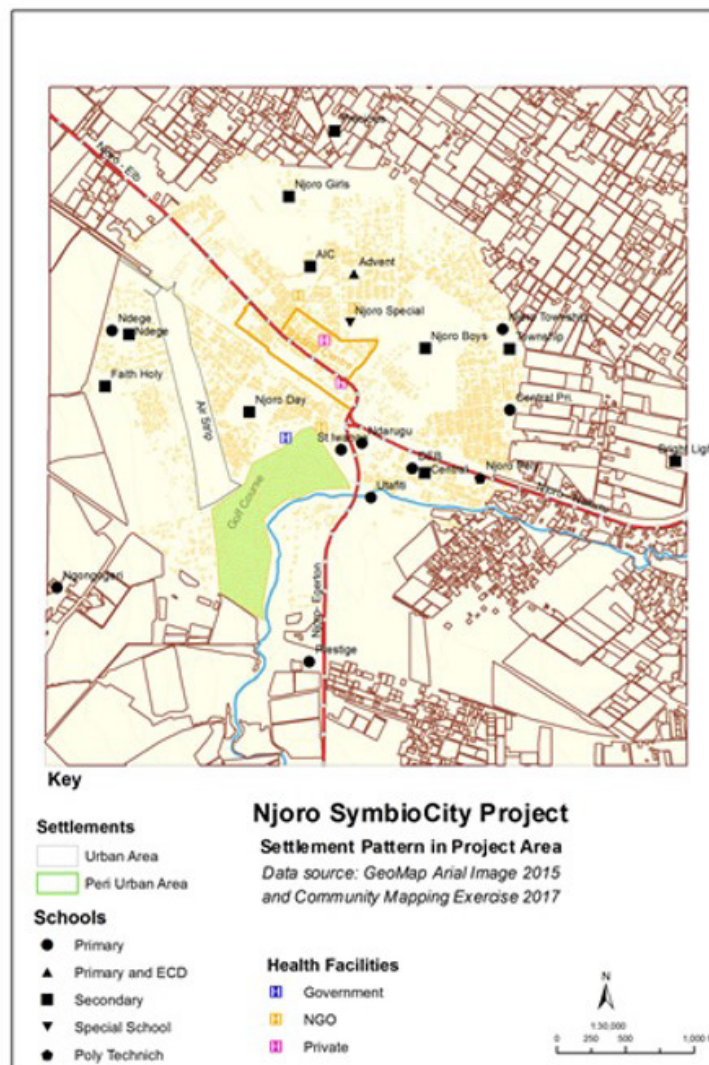
## Urban Systems and Functions

### Urban Structure and Land Use

#### Urban structure

Njoro town takes a zonal model of urban structure. The town is growing in an outwards radius from the old market established around the railway station. The town has adopted what seems like a series of rings. The innermost ring represents the central business district locally known as Posta. A second zone of mixed residential and commercial uses, containing schools and light industries surrounds it. It is characterized by poorer-quality housing. The third ring contains residential homes and rental housing and is dominated by the middle-income class.

The fourth ring is composed of newer, better and larger residences, owner occupied with elaborate green compounds. The outermost ring is of agrarian-daily-commuter business people who frequent Central business district and secondary towns for delivery and purchases. Certain areas of Njoro like Egerton Market centre are more attractive to activities related to housing & services and are too adopting a zonal model of development.



### **Housing and Residential Development**

Landscape in many parts of the Sub County is characterized by small-scale land holdings with mean landholding size of about 0.77 Ha in the rural areas and about 0.05 Ha in the urban area. Demands for housing continue to encourage sub division of prime agriculture land and encroachment to forest reserves and public utility land. This high rate of urbanization has resulted in drastic land-use and mushrooming of formal and informal settlements.

Njoro town is characterized by mixed development. Lavish and medium income dwellings boasting of two to three bedrooms dominate some parts of the town. Golf Estate, Jordan Majangwa – I and Umoja are some of the high income estates elaborate afforded fair quality facilities and are predominantly owner-occupied. A majority of houses in Baraka, Bondeni, Contractors, Huruma, Jua Kali and Teachers are one bed roomed and have fair sanitation. Rental houses are single rooms of semi-permanent nature constructed of mud and wattles with impervious floors but may also be wholly pervious.

### **Informal Settlements**

Residents in Informal Settlements face innumerable problems: poverty, unemployment, high cost of conventional building materials, insecure land tenure, lack of information and poor basic infrastructure and services. These problems have immensely accentuated the vulnerability of low-income families, who increasingly find they are living in health and life threatening conditions. Many urban centers have registered increased growth of urban slums. In secondary towns such as Njoro, growth, at between 13-24% per year, is even faster. In Njoro, this situation has severely affected the capacity of the County Government in dealing with adequate provision of basic services, information management, as well as sustainable urban development strategies and control.

Jewathu, Kariobangi, Ndege and Industrial Area –over-crowded and partly unsanitary low-income settlements with poor services are the most noticeable consequence of rapid growth. These single room dwellings lack water, adequate toilets and suffer poor ventilation and lighting predisposing dwellers to serious health conditions.

### **Urban Form and Architecture**

Njoro town can be viewed as a transit town with the constant movement of goods and travellers along the Nakuru- Njoro Road, the Njoro-Mau Narok Road and the Njoro-Elgurgon Road that converge here helping underscore the town as so. A network of internal road networks that serve the various districts interspersed within the SymbioCity planning area also serves the town. A number of public and private schools are located in the planning area as well as religious institutions such as churches and a mosque. Generous endowment of greenery in open public spaces and along the traffic circulation and multiuse spaces further define the urban character and form. Built up areas are concentrated along the various roads and thus the urban form and architecture changes as one traverses these channels of movement. The planning area comprises the ordinary urban districts to be found in any urban centre in Kenya today each with a discernible character and form. The districts include commercial, residential, industrial, religious, educational and recreational.



## Commercial zones

The main commercial areas comprise mainly of permanent structures varying in size and height thus creating an undulating streetscape especially along the Njoro- Elburgon road where most of the newly built modern buildings are to be found. These modern buildings range single level (ground floor only) to four levels (ground plus three floors) with commercial activities fronting the highway being accessed by way of covered walkways and verandahs. Older buildings are also to be found in the commercial zones as well as kiosks and other semi-permanent structures such as boda boda sheds and open air motor vehicle repair yards. The interplay of these old and new, permanent and semi-permanent structure collectively create the architecture of Njoro town CBD.

An active commercial strip has grown in the vicinity of Egerton University along the Njoro- Mau Narok Road. Whereas this is well outside the SymbioCity planning area it is nevertheless an area on interest since a substantial proportion of the economy is reliance on the university including transport and tenancy accruals.

The architecture of numerous petrol service stations that are quite numerous in the planning area complements the streetscape.

## Landmark Buildings

The African Inland Church building located on the spine of road heading to Elburgon (a short distance from the transit node to Mau Narok, Nakuru town and Elburgon) is one that stands out as its architecture comprises features that stand out among buildings in the surrounding. The roof is in clay tiles and the church spire rises to the sky pronouncing the position of the church bell in a design of days gone by.

Other buildings with unique architecture include the Post Office also along the Elburgon road as well as the modern Kenya Commercial Bank building. The Lord Egerton Castle well outside the planning area is a tourist attraction of international repute with a rich history that has helped put Njoro on the map.



Africa Inland Church Building

Kenya Commercial Bank Building



Egerton University Sacco Plaza outside the planning area in a growing and active commercial strip

The 52 room Lord Egerton Castle. Though outside the planning area, it has a historical significance for Njoro



Njoro Post office

## Public Space

### Community Halls

Njoro is an old colonial that was being managed by the defunct County Council of Nakuru which invested very little on social facilities. The town has only one social hall which is dilapidated and is currently not in a state that can be used by members of the public.

### Stadium

Njoro has land set aside for development of a stadium. The land measures approximately 2 hectares and adequately secured by a perimeter fence. The site is currently used for sporting

activities such as football. The main challenge is that the land is not well developed and equipped for sporting activities.

### Golf Course

Njoro has one golf course which is a private members club. The course occupies land that is approximately 30 hectares and it's in good quality for sporting activities.

### Public Park

There exists a public park in the middle of the Central Business District that is frequented by the members of the public. The key features in the park include the following:

- A public toilet maintained by the County Government;
- Abundant shade afforded by numerous mature trees.
- The park lacks fixed furniture forcing users to sit on the grass.
- The park lacks paved walkways that are ideal during wet rainy seasons and
- The space has been degraded leaving the earth exposed due to lack of soil cover



Njoro public park (No seats for visitors)

Public park in the CBD. The park has a public toilet but lacks furniture



Open space at the intersection to Nakuru, Elburgon and Mau Narok. A public toilet and modern Kiosks funded by the Youth Enterprise Fund are located here

The disused railway track and surrounding land occupies considerable land in Njoro. The track echoes an era long gone

## Housing

Shelter is the basic human requirement that needs to be met on priority basis. It is much broader concept than housing. Investments in shelter not only improve and expand the available stock of housing units, but also improve both the working and living environment. While it may be difficult to prove, there are impressionistic links between improvements in housing and increased productivity, health, and other measures of well-being. Housing sector is employment intensive; it generates employment during its construction period and also during its life for proper maintenance. The United Nations Centre for Human Settlements (UNCHS) uses a broader term “Settlement conditions” because it extends to all those components of the physical environment with which an individual or a community comes into contact and which are used on a regular basis for a whole range of human activities - the individual dwelling and its related services, the dwelling’s immediate surroundings, community facilities, transportation and communications network and so on. Food, clothing and housing are required in that order for fulfilling the aspirations of the people.

For a long time, bungalows have been the predominant house design in Njoro town. However, with the continued rise in population, the town has seen a shift to the development of high rise flats. Locally sourced materials and labour are used without adversely affecting the local economy or environment, and enable the maintenance and upgrading of the house using local tools and resources. A mixture of mud, stones and brick houses can be observed in the low income settlements of Bondeni, Njowatho and Ndege. Most residents use shallow well water, often situated in close proximity with the pit latrines increasing the chances of cross contamination. The main sanitation facilities are simple pit latrines followed by septic tanks. Over ninety five percent of households in the low -income settlements use pit latrines or soak - away pits to dispose of human waste.

A healthy house is bright, open, energy efficient and welcoming whether new or renovated. Apart from the settlements in the informal settlements, housing in the larger Njoro town area can be generally be said that they exhibit quality of indoor air and lighting. They are energy efficient since they use renewable energy (sun) for heating and do not have heating systems. Further, most of the building materials used has been harnessed using man power as opposed to factory produced products. In terms of environmental Responsibility, the houses does not offer alternative water and wastewater systems, lacks site planning that reduces land requirements, and doesn't consider broader community planning issues such as transportation. They are however affordable as different income groups have appropriate housing estates to choose from. One thing to note is that a considerable percentage of the houses are of poor quality and a majority of them has been poorly maintained.

Residential areas in Njoro can be divided into public and private, public residential areas are located in public institutions such as government estates, public schools and parastatals.

### **Public Residential zones**

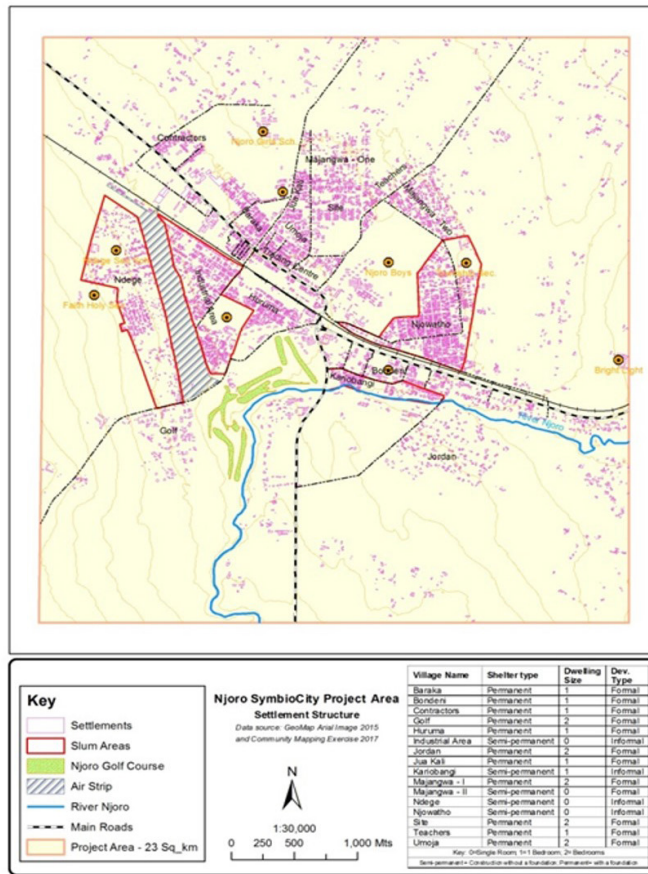
These are mainly in the county government residential estates of Bondeni and Posta as well as in the staff quarters in Njoro Boys, Njoro Girls Secondary schools. The house types are permanent in nature mostly one, two and three bedroomed built of natural stone with screeded floors, plastered walls and roofed mainly in iron sheets and asbestos in the case of Bondeni county estate. A number are also within the Kenya Agriculture and Livestock Research Organization (KARLO) compound along the Njoro Mau Narok road.

### **Private Residential zones**

These are located in several areas within the planning area. Majority of the houses are single storey (ground floor only) and comprise one, two and three bedroom units. Located outside the planning area are new stand-alone residential flats on two and three levels targeting young modern families that may not require a private compound. The nature of construction varies with majority built in natural stone with screeded floors, plastered walls and roofed mainly in iron sheets. Semi-permanent houses in timber and even mud are still to be found in the older residential areas.

It's worth noting that social housing does not exist in the planning area. This means that the low income group is not being catered for by the government as usually the private sector shuns it. This has to an extent led to the mushrooming of informal settlements in the town. Given the small size of the town, it becomes easy to explain and connect the high number of informal settlements to the lack of social housing.

In terms of tenure security, majority of the households and landlords holds allotment letters while the tenants don't have any written contract i.e. tenancy agreement between them and their landlords.



A Settlement Structure map for Njoro

Residential Districts



New Multiple dwellings outside the planning area

New Multiple dwellings outside the planning area in Egerton University area



Private multiple dwellings in the planning area



Private dilapidated residential houses in the older part of town within the planning area



Private single dwelling in the planning area



Public housing at the County Housing Estate in the planning area. Houses recently refurbished by the county government

## Water and Sanitation

Water is an essential commodity that has economic, social and cultural value to communities. Kenya is a water scarce country with a per capita of 647 cubic meter, which is below the world recommended per capita of 1000 cubic meters (Mogaka, 2009). There is unequal distribution of water in the country with some areas having excess and others having less than they require, which on average makes the country water scarce. Kenya as a country is facing a number of serious challenges related to water resources management. A number of these challenges are as a result of factors both within and outside the water sector. Climate variability and increasing demand for water as a result of development and population pressure are factors that the sector

may not be able to control but can initiate mitigation measures to ensure sustainable water resource development. Kenya's planning target on water is to provide clean and potable water at source less than 1 km in high potential areas and less than 5 km in ASALs.

Most inhabitants of Njoro do not have regular access to clean drinking water and face severe water shortages particularly during the dry season and the fact that the fluoride levels in their ground water is beyond the required levels for human consumption. One thing to note is that, rain water harvesting is inadequately utilised thus a great source of clean water remains undeveloped.

Njoro urban area is facing a number of challenges regarding water distribution and supply namely;

1. **Growing Population:** The growing population increases the demand for water for domestic use, food security and industrial development. The population Growth trend has resulted in reduction of per capita water availability.
2. **Water scarcity:** Globally a country is categorized as 'water stressed' if its annual renewable freshwater supplies are between 1,000 and 1,700 cubic meters per capita per annum and 'water scarce' if its renewable freshwater supplies are less than 1,000 cubic meters per capita per annum.
3. **Climate variability and Water Resources Degradation:** Drought is a recurring phenomenon and its impact on water resources is usually devastating. Floods lead to disasters particularly in low-lying areas. Occasionally floods have caused devastating impact on the sector. Both climate variability and environmental degradation has resulted into:
  - Catchments degradation
  - Drying up of Rivers
  - Receding of lake levels
  - Heavy siltation in dams, rivers and pans water supplies
  - Deterioration of water quality
  - Increased water use conflicts due to competition on the available water resources
  - Damaged roads, railway lines, bridges, buildings and water intakes

The impact of climatic variability and water resources degradation has manifested itself in declining food production and damage of infrastructure.

In order to reverse this trend of water resources depletion under erratic climatic variations, there is need to put in place,

- Effective management of water catchment areas
- Construction of dams and pans to increase our water storage capacities
- To curb water pollution by ensuring adherence to all waste water standards before disposal into our water bodies
- Rational apportionment of our water resources thereby avoiding water use conflicts

Groundwater conservation areas are the areas where the groundwater aquifers are threatened with over-exploitation and therefore no exploitation of such groundwater shall be done without the authority of the Water Resources Management Authority (WRMA) in accordance with the Water Act 2002 and the conditions thereafter appended to such an authority.



**i. Catchment Degradation**

Catchment degradation results in increased runoff, flash flooding, reduced infiltration, erosion and siltation. Catchment degradation is a major problem, which is undermining the limited sustainable water resources base in the country. The main causes of catchment degradation are poor farming methods, population pressure and deforestation.

**ii. Storage and infrastructure Investment:**

The storage capacity has been low due to the fact that investment levels in water management infrastructure have been inadequate and have been on a declining trend for many years.

**iii. Groundwater depletion:**

The high demand for water, encroachment on recharge areas, lack of accurate information on groundwater potential and the poor monitoring of groundwater in use may lead to depletion of groundwater. This in turn could result into a number of other related problems including falling water tables & contamination of groundwater and become salty due to its depletion. The groundwater depletion has also caused drying up of base flows in springs and rivers and could even result in land subsidence in some areas.

**iv. Pollution:**

Agricultural fertilizer and pesticides eventually leach to waterways. Egerton University sewerage plant and partially treated or untreated industrial effluents in the area discharge wastewater directly into surface watercourses. These contain high levels of organics, metals and other toxic substances

**v. Water Allocation:**

Water resources allocation decisions related to surface water abstractions and borehole permits issuance are made without adequate data availability. It is estimated that more than 50% of water abstractions are illegal as per the water master plan, which applies to Njoro.

**vi. Resources Assessment:**

Kenya being a water scarce country, it is all the more important to ensure that the water resources are continuously monitored, assessed and evaluated in order to plan for water security. It is necessary to understand the climate and identify trends. Existing records are incomplete both in time and coverage of the country while the capacity for data collection, storage, analysis and dissemination is poor.

**vii. Impact on the economy:**

Inadequate water resources management imposes a huge cost on the nation's economy. The economic costs of poor preparedness to climate variability entails disruption in water supply, energy production and industrial output, agricultural and livestock output.

**viii. Inter/Intra Basin Water Transfer:**

It is clear that water resources (both surface and groundwater) are unevenly distributed spatially in this country. Increasing human activities especially in urban areas has led to a situation whereby the demand for water is being met from water abstracted from a different catchment or drainage basin.

Others Problems are;

- Inadequate supply of safe water especially low income areas i.e Jowatho Estate/Ndege, Rumwe Estate.
- Water hawking from unknown water sources.
- High levels of fluoride parameters.
- Leaking pipes due to ageing and vandalism.
- Lack of clear water policies.
- Poor billing systems.
- Pollution of water sources.
- Water rationing.
- Illegal connection.

## Solutions

### A. Reduction of unaccounted for water

Reduction of unaccounted for water is the most cost effective way of supplanting the supply of water. The means for reduction of unaccounted for water include physical means for improving the efficiency of the water delivery systems from the water source to the households and reducing leaks throughout the network; and means for reducing the technical, management and social losses. This is mainly accomplished by rehabilitation of the dilapidated systems, laying new pipes, standard fittings, detecting and fixing leaks, and installation of pressure control valves, zonal and bulk meters at key points in the system.

The most effective measure for reducing social losses is by making water affordable, available and accessible to the poor. Effective metering (including in rural areas) of water delivered to kiosks and households will be monitored and regulations strictly enforced to prevent damage to meters and pipelines and to enable access to the meters by meter readers.

### B. Rehabilitation and expansion of existing schemes

Most of the current operating urban schemes have long passed their economic life which increases the unaccounted for water. Furthermore, the schemes are serving more people than they were initially designed for. Emphasis is on rehabilitation and augmentation of the existing water supplies to increase water production.

### C. Demand management

In the light of large water losses in the systems and water scarcity and increasing demands, managing the demand for water and increasing the efficiency of water use is of critical importance. In few cases, this needs to take a priority over building new supplies. Lack of demand management in the water schemes has contributed negatively to economic value in use of water. It has also led to investments and requests for investments that could have been or can be deferred. The need for water utilities to put demand management in practice cannot therefore be over emphasized.

#### *Construction of new water supply schemes*

New and additional water sources are required for urban centres and rural areas, while other market towns have developed over the years in urban centres requiring urban water supply systems.

#### D. Assessing Land Suitability for Rainwater Harvesting Using Geospatial Techniques

Water demand increases as population increases leading to over exploitation of water resource. Consequently, there is need for improved water resources management complemented with rain water harvesting within the catchments. There is need to assess land suitability for surface runoff harvesting using geospatial techniques. ArcGIS can be used in delineating the lineaments from Digital Elevation Model (DEM) of the catchment thus showing areas where great potential exists for rain water harvesting within the catchment.

Other Solutions are;

- Formulate policies to regulate water supply.
- Improve billing systems.
- Extend reticulation to all areas that are not covered.
- Better water management practices

This town has no sewerage connection or sewer treatment plant so far. This leaves people to rely on septic tanks (those who can afford) while the majority rely on pit latrines. The existing pit latrines are a serious health issue as indicated by one of the social workers. Adequate sanitation facilities prevent faecal contamination of water and so curb transmission of faecal-oral diseases at source. Inadequate sanitation leads to coping mechanisms like sharing of dirty, defecation in the open and indiscriminate dumping of household wastes. Such dumpsites pollute the environment through bad odour and are breeding grounds for vermin namely; rodents, fleas, flies and mosquitoes. Sanitation practices that remove human waste from the immediate vicinity of one community only to contaminate the water supply and environment of neighbours are unsustainable. Major behavioural changes are needed to overcome this.

#### Water sources in Njoro Township

Water is Life and Sanitation is Dignity. Access to water supply and sanitation is a fundamental need and a basic human right. It is vital to satisfy basic right to life with dignity that includes health to all people. The health and economic benefits of water supply and sanitation to households and individuals that is of special importance to the poor are the time saved, convenience and dignity that improved water supply and sanitation present. Most of those without access are the poorest and least powerful. Access for the poor is a key factor in improving health, economic productivity and above all self-esteem and it is therefore an essential component of any effort to poverty alleviation.

Poor water supply and sanitation have high toll on health, cause resource conflicts and /or violence and indeed degrade human self-worth. Improving water and sanitation brings valuable benefits to both social and economic development. Social well-being encompasses more than simply material satisfaction, it takes account of less tangible aspects of people's lives such as the quality of neighbourhoods, work and leisure, the environment and the ability to fully participate in society. Sufficient potable water and adequate sanitation contribute to social dignity by improving on both the natural and human environments in terms of ensuring cleanliness, reduced morbidity and increased human capital which adds up to enhancing social status in the community.

In Njoro, there are several water supply sources to communities including protected springs, piped water from Njoro River, municipal water, community boreholes with kiosks, community borehole with individual connections and rain water harvesting. Households that are not

connected with piped water face a risk of drinking untreated water from open wells or surface waters. Water use is an important element in pursuit of personal well-being. When people get used to spending a certain amount of water to satisfy needs, in the absence of a sustained supply from the source they will seek to source for the water from elsewhere to meet the deficit. The main risk of the use of untreated water includes high incidents of water related diseases in the area. Depending on the source, women in Njoro face the challenge of walking long distances to draw the water or make long queues waiting to fetch the water. This narrows down the public life of women restricting them to participate in the public activities only 60% of the residents are connected to water supply.

- Rongai South System – Gravity system. Source – Rongai River at Elburgon. No of time received – 4 times per week it serves part of Njoro town which receives water once per week.
- Shell borehole yield = 6.7m<sup>3</sup> per hour
- Majangwa – Borehole yield = 13m<sup>3</sup> per hour
- Golf Club Borehole yield = 3m<sup>3</sup> per hour
- Ndarugu River which is a season river and highly contaminated through silting, car wash activities, animal and agricultural activities.



A Map showing location of borehole water sources in the project area



A water vendor fetching water at Ndarugu River



A line forming at the water point which looks turbid



A young girl from fetching water in Majangwa



Some form of rain water harvesting in Jowatho

### Public Toilets

Njoro has two public toilets, which is not sufficient for the urban residents and visitors. The toilets are located in the open-air market and a new one located at the Egerton University junction. Registered Self-help groups manage these by charging a minimal fee per visit. The proceeds are used for maintenance and payment of wages for an operator.

Toilet services are negatively affected by lack of a sustainable source of water, which makes it expensive to buy water for day to day usage. In addition, lack of a sewerage system makes it a must to develop a septic tank for the toilets. This makes the operational costs higher.

## Waste

Solid waste management is a key function of the county government. This activity is carried out by the department of Environment, Water and Energy. Njoro town was previously managed by the defunct County Council of Nakuru, which did not put in place a town management structure that would have taken care of solid waste matters. The County Department of Environment estimates that a total of 60 tonnes of waste is collected per month in Njoro. The waste is collected through Community Based Organizations, which have been contracted by the Department of Environment to handle domestic waste while the County Department handles waste from public spaces and buildings such as the market and the streets. Waste that is collected is transported 20 kilometres away to the Nakuru town dumpsite.

There has been little effort to separate and recycle waste. However, no budgets have been set aside for this activity. Much of the waste generated here is biodegradable in nature thus providing an opportunity for biogas and composting for farm use manure.

The department of environment has inadequate capacity in terms of equipment in that Njoro Town has not been allocated any solid waste collection vehicle. In terms of human resource capacity, Njoro has 40 employees among which only 7 are engaged on permanent basis which the remaining are casuals. In view of the above issues, it is evident that solid waste management faces numerous challenges such as lack of equipment to collect and transport waste, poor waste management practices and lack of technical capacity in safe solid waste disposal.

## Energy

Energy comes in many forms the most familiar form being electricity. Electricity itself is not a primary source of energy, but an energy carrier. Electricity can be generated from a variety of energy resources and can be converted into almost any other form of energy, such as chemical or mechanical. Whenever energy is converted from one form to another, some energy is lost.

Energy supplies used in Njoro fall into two categories: industrial sources (electricity and petroleum) and traditional sources (wood, charcoal and agricultural residues).

Illuminating kerosene is the most common form of lighting & cooking energy in the informal settlements while the use of solar is relatively low in Njoro. This is in contrast to the fact that the area receives adequate and favorable climatic conditions (sunny) for solar power harnessing throughout the year. It is worth noting that most of the hotels and eateries especially the nyama choma joints (butcheries) in the planning area prefer to use biomass as the primary source of energy as opposed to LPG gas which is cleaner and probably cheaper. This means that most of the eateries are smoky which interferes with the ambience of the space and the comfort of the visitors/clients.

Further, electricity distribution in the area is well developed allowing its access by a majority of the residents. However, this abundance in power distribution and access is not felt within the markets, thus complicating any chance of having a 24-hour economy. However there are on going efforts to light up the streets by the County Government. Surprisingly, instances of reported cases of insecurity in the town remain low and to some extent do not exist.

### Challenges

- Indiscriminate charcoal harvesting which contribute to environmental degradation
- Indoor air pollution as a result of using firewood and kerosene hence ill health

### Solutions

- Regulating charcoal/industry
- Enforcement of laws and regulations on environment to reduce deforestation
- Promoting alternative energy sources like
  - LPG though from fossil fuel is cleaner and cheaper than the more damaging biomass which has negative effect to the environment and health of the users
  - biogas since there is a lot agricultural waste as a result of farming activities and livestock rearing which can be a resource and
  - solar which is more sustainable due to the favorable climatic condition of the area and has less operational costs

## Mobility

Transport system in an urban area is of great importance. When there is a poor transport system it will contribute to; traffic congestion, poor urban air quality, vehicular-pedestrian conflict, un-economical use of urban space and also pollution among other demerits. Transport is vital to the well-functioning of economic activities and a key to ensuring social well-being and cohesion of populations. Transport ensures everyday mobility of people and is crucial to the production and distribution of goods. Adequate infrastructure is a fundamental precondition for transport systems.

**(Definition) Transport system:** A transport system is defined as consisting of fixed facilities, flow entities and control systems that together permit people and goods to efficiently overcome the friction of geographical space in order to participate in a timely manner, in desired social or economic activities (Papa Costas, 1993 in Aligula et al, 2005).

Below, several modes of mobility prevalent in Njoro are as discussed below;

#### i. By foot (Walking)

Walking is the main means of getting around Njoro town for local people. As you realize, the size of the Njoro urban area (which might be called CBD) is quite small which makes sense for one to walk through. The main challenge is lack of well-defined walkways and as result, people compete with vehicles for walking areas on the carriage way.

#### ii. Matatu

Local matatus are the main means of getting local people out of the township to neighboring urban centres like Nakuru and Molo. The vehicles themselves are mainly 14-seater minibuses. Despite periodic government drives to regulate the matatu industry, the matatus remain notorious for dangerous driving and overcrowding. Mololine Prestige Shuttle is one of these plying the route from Nairobi to Kisumu. There is one official matatu terminus and one illegal terminus at the junction to Egerton University where the locals board the matatus. Matatus leave when full and the fares are fixed in the main/official terminus but the fares seem negotiable at the other terminus.

### iii. Boda-Boda

Boda-bodas (motorcycle taxis) are very common here since standard taxis are hard to find and those available are a bit expensive whereas the matatus follow the main tarmac roads. Therefore, the boda-bodas are the ones that serve the peri-urban areas of Njoro. There's a particular proliferation of these taxis here and a short ride should cost around Ksh. 50/= or so.

### iv. Taxi and Shared Taxi

In Njoro Township, you'll generally find several banged-up old taxi for easy access to outlying areas but towards the vicinity of the Egerton University, they become more visible. The fares are invariably negotiable and start around KSh300 to KSh500 for short journeys. Since none of the taxis have functioning meters, the fares are agreed upon prior to setting out.

Shared taxis are a good alternative to matatus. The vehicles are usually saloons that take 4 to 5 passengers and leave when full. They take less time to reach their destinations than matatus as they fill quicker and go from point to point without stopping, and so are slightly more expensive. This form of transport is predominant around the Egerton University area where the students are the major clients as they commute between the campus and their hostels.

### v. Donkeys, Lorries, Pick-ups and Tractors

The main economic activities in Njoro are agricultural-based industries including vegetable and milk processing, large-scale wheat and barley farming. Light manufacturing industries such as timber milling and quarrying are also a mainstay of the local economy. As a result, transportation of these agricultural products and building materials from the farm & quarries to the markets is paramount. Depending on the economic status, product, quality of the road and the weather conditions, a variety of modes of transportation are utilized which range from donkeys, pick-ups, lorries and tractors. Timber and other building materials are mainly transported using lorries and tractors while farm produce utilizes all above modes of transportation depending on the volume to be transported.

### vi. Biking

Biking (non-motorized bicycles) are a common sight here but they are low in numbers. However, the available bikers are not for commercial purposes but a means of transport by their owners. The great challenge with this form of mobility is the fact that there is lack of well-defined bicycle lanes.

### vii. Railway transport

Railway transport was introduced in Kenya by the colonial government. It was mainly built to open up the interior of Eastern Africa which produced many agricultural goods. Njoro Town was one of the beneficiaries as an agricultural hub but it has since been abandoned due to the mismanagement of the railway sector and the rise of other modes which are more convenient to the farmers i.e. lorries and tractors.



### **viii. Air Transport**

Air transport in Njoro Town is non-existent. However, there is an abandoned airstrip within the area which can be utilized when need required though it is in bad condition.

### **Challenges bedeviling mobility in Njoro**

Highly connected infrastructure networks are commonly associated with high levels of development in any urban area. When transport systems are efficient, they provide economic and social opportunities and benefits that result in positive multipliers effects such as better accessibility to markets, employment and additional investments. When transport systems are deficient in terms of capacity or reliability, they can have an economic cost such as reduced or missed opportunities and lower quality of life.

Among the most notable urban transport challenges in Njoro are;

#### **i. Encroachment of the road reserve**

There is encroachment of the road reserves by informal businesses, illegal parking & matatu picking points. These existences of informal activities take place along the road reserves. These have manifested itself mostly on the main road towards Molo eg. Illegal parking at Njoro junction by matatus

#### **ii. Open drainage channels**

The entire Njoro urban area is faced with poor drainage of storm water. The drainage channels are open, which is a risk for the pedestrians as they use the periphery of the carriageway and drainage channels as walk paths.

#### **iii. Non-operating street lighting system and Insecurity**

Street lighting is a basic component particularly in road transportation system. It always forms part of the utilities that utilize the road shoulders. Their role is to enhance the use of roads at night by provision of light. Another important role is to promote security for the night road users considering the area is an urban setting where insecurity is one of the major challenges. The case in Njoro is very unique since the infrastructure for the streetlight is there but there is no power.

#### **iv. Existence of potholes**

The only main road in Njoro town is poorly maintained both the carriage way & the road shoulders. Potholes characterize the carriageway while the road shoulders are non-existent which makes it dangerous for motorists and pedestrians.

#### **v. Mixed traffic on the road carriage ways**

There is a mix-up of traffic using the road carriageways. Due to the lack of non-motorized transport infrastructure, the vehicles, the cyclists and the pedestrians all share the same carriageway in some instances especially in the central area of the township.

#### **vi. Lack of a well-developed Road Network**

It is worth noting that apart from the main road to Molo that cuts through the town is up to bitumen standards, the rest of the roads in the town are either graveled or earth roads. This creates a major challenge in terms of dust pollution during the dry season and a major headache during the rainy season as some of them are impassable.

### Solutions

A good transport system is an important component of the economy and a common tool used for development. This is even more so in a global economy where economic opportunities have been increasingly related to the mobility of people, goods and information. When transport systems are efficient, they provide economic and social opportunities and benefits that result in positive multiplier effects such as better accessibility to markets, employment and additional investments. When transport systems are deficient in terms of capacity or reliability, they can have an economic cost such as reduced or missed opportunities and lower quality of life. For this to be effective there should be proper segregation of traffic in a town set up in order to create the smooth flow of traffic.

Several proposals to solve the challenges of mobility are;

- Propose the creation of adequate walk paths.
- Propose better maintenance and covering of drainage channels
- Operationalize the street lights
- Propose carpeting of town access roads
- Proper traffic segregation on the road carriage ways so as to have ways for vehicles separated from that of pedestrians and cyclist
- Propose road expansion to cater for road shoulders
- Propose creation of properly designated parking areas/slots
- Clear the encroachments on road reserves

### Information and Communications Technology

Information Communication Technology infrastructures is an important impetus for economic growth, more so, in terms of its role in increasing business interactions within the rural area. This is due to the insignificant use of intermediaries during the trade process. ICT infrastructures, such as computer services, internet surfing services, telephone booths, fax and postal telegraphic as well as parcel delivery services, are important factors of ICT, worth examining. The proposition that the study holds is that the availability of these infrastructures determines the level of development of the study area.

The main settlements are nucleated around Bondeni trading center, Njoro trading center, Egerton University and Thigio trading center. Settlements are in form of villages including, Jewadhu to the West, Kariobangi to the East, Huruma and Njoro to the South. Settlements are inter-linked and are hardly divorced from one another in terms of use of telecommunication services.

The results have demonstrated that those with ability to make savings from their earnings are minimal, since most of the households concentrate on supporting only the basic needs. The level of households' income and ICT awareness reveal some kind of high ratio of dependency. Majority have very minimum savings that would really subsidize their expenditure on ICT needs. Although there is a rising level of Information Communication Technology Awareness

[54.0%], still there is a growing level of inadequacy of the residents in exploring the use of information communication technology in their areas of expertise and even trade.

Further, despite the liberalized market in terms of ICT services, telephone access and ownership remain scanty among the isolated cases of low-income earners. Literacy and the level of ICT awareness tend to be intertwined, where either of the factors is capable of spearheading the other. A minority of the population [20.4%] have used computer before thus computer knowledge is fairly low.

While the Kenyan government, through Telkom Kenya, has initiated several information transmission technologies, particularly, the uses of Post Office for parcel delivery, most of these services are poorly managed making communication even more unattainable. Public booths have since been abandoned, poorly maintained and others vandalized curtailing efficient communication for those who can't afford mobile phones. This has consequently allowed the emergence of private competitors in the ICT market. While fair competition has been economically wedded as an efficient way of ICT service delivery, sourcing for the alternative communication services is springing up but occasionally, has been jeopardized by technicality of either Internet Service Provider or connection from Telkom. Hence, whereas households source for alternative communication devices, the cost still remains high for most of potential users.

Further results have revealed the availability of Internet Cyber Cafes as well as Safaricom, Orange and Airtel Card Centers. There is wide usage of mobile Internet services, albeit for social interaction as opposed to building business linkages.

## Chapter 3

# Conclusion: Key Sustainability Issues

### Challenges Identified

#### Main Clusters of Challenges

The following main areas of challenges have been identified during the continued analysis of the current situation:

1. Inadequate Water and Sanitation
2. Poor Solid Waste Management
3. Poor Roads and Transport
4. Dwindling Culture and Recreation
5. Unemployment

Priority No.	Key Issues/ Challenges	Objectives
1	Inadequate Water and Poor Sanitation	<ul style="list-style-type: none"> <li>• Clean, safe and adequate quantities</li> <li>• Equity in distribution</li> <li>• Hygienic toilet system</li> <li>• Sewer system connected to treatment plant</li> </ul>
2	Poor Solid Waste Management	<ul style="list-style-type: none"> <li>• To establish sustainable solid waste management system</li> </ul>
3	Poor Roads and Transport	<ul style="list-style-type: none"> <li>• Improved road network to all parts of the planning area</li> <li>• Enhancing non-motorized transport</li> </ul>
4	Dwindling Culture and recreation	<ul style="list-style-type: none"> <li>• To embrace rich cultural life for all residents</li> <li>• To promote sports and recreation activities</li> </ul>
5	Unemployment	<ul style="list-style-type: none"> <li>• To enhance youth and community empowerment</li> <li>• To promote agro-industry for job creation and value addition</li> <li>• To integrate commercial services and education sector</li> </ul>

For the city to develop in a sustainable way, it needs to address the following key/main issues:

Further secondary issues/challenges identified during the review exercise in “what is bad in Njoro” were:

- Poor planning
- Bad use of resources
- No water
- Poor Drainage
- Poor land management
- Poor management of natural resources
- Poor housing

### Assets Identified

- Agricultural potential
- Good Education system
- Water improvement
- Prime Location
- Good Climate
- Cosmopolitan nature
- Roads
- Good security
- Business friendly
- Accommodative culture
- Presence of research centres

### SWOT analysis

The following SWOT analysis has been done:

STRENGTHS	OPPORTUNITIES
<ul style="list-style-type: none"> <li>• Cosmopolitan population</li> <li>• Human resource-skilled and unskilled</li> <li>• Political stability</li> <li>• Conducive business environment</li> <li>• Geographical location</li> <li>• Availability of land</li> <li>• University education</li> <li>• Research institutions</li> <li>• Agriculture/horticulture</li> <li>• Livestock</li> <li>• River</li> <li>• Forest</li> <li>• Quarry, stone, sand, murrum</li> <li>• Road network, internal &amp; external</li> <li>• Good Communications and connectivity</li> <li>• Railway reserve</li> <li>• Abandoned airstrip</li> <li>• Hospitals</li> </ul>	<ul style="list-style-type: none"> <li>• On crossroads</li> <li>• Natural resources (river, rich ground, Water reserve)</li> <li>• Proximity to forests</li> <li>• Proximity to Nakuru town</li> <li>• Former railway reserve</li> <li>• Airstrip land available</li> <li>• Large student population</li> <li>• Possible industrial development</li> <li>• Possible horticultural development</li> <li>• Expansion of hospital</li> <li>• Social amenities e.g. revival of the youth centre</li> </ul>

WEAKNESSES	THREATS
Poor leadership	Climate change
Poor planning	Deforestation
Inconsistencies in service delivery and project implementation	High population growth
Uncoordinated government management	Unemployment
Corruption	Road accidents
Lack of safe water	Mistrust
Poor sanitation	Radicalization
Poor drainage	Political instability
Poor waste management and attitudes	Land grabbing
No bus terminal	Unplanned & uncoordinated land subdivision
Poor economic development	Poor enforcement of plans
Lack of financial services	Poor management of funds/resources
Lack of marketing of agricultural products	Inadequate funds & inflation
Lack of support for economic development	Agricultural diseases
Drugs and substance abuse	Human diseases
Insufficient civic education	Domestic violence

## Vision, Objectives, Strategies & Actions for the Sustainable Development of Njoro Town

	DO NOT WANT	WANT
HAVE	<b>CHALLENGES</b> <ul style="list-style-type: none"> <li>• Poor solid waste management</li> <li>• Inadequate water supply</li> <li>• Poor sanitation</li> <li>• Poor housing</li> <li>• Poor drainage system</li> <li>• Unemployment</li> <li>• Poor road network</li> <li>• Rapid urbanization and poor planning</li> <li>• Pollution-environment al degradation</li> </ul>	<b>ASSETS</b> <ul style="list-style-type: none"> <li>• Land (Agricultural arable)</li> <li>• Education institutions</li> <li>• Research institutios</li> <li>• Good climate</li> <li>• Industries (Timber &amp; canning factories)</li> <li>• Flower farms</li> <li>• Njoro river</li> <li>• Boreholes</li> <li>• Air strip</li> <li>• Population- Human resource</li> <li>• Railway lines</li> <li>• Green species</li> <li>• Wide roads reserves</li> <li>• Cultural diversity</li> </ul>

DO NOT HAVE	THREATS + PROBLEMS	DREAMS, VISION
	<ul style="list-style-type: none"> <li>• Insecurity</li> <li>• Food insecurity</li> <li>• Disease outbreaks</li> <li>• Political instability</li> </ul>	<ul style="list-style-type: none"> <li>• Improved agri-business</li> <li>• Adequate safe water supply</li> <li>• Quality all weather</li> <li>• Proper solid waste management</li> <li>• Housing (Adequate &amp; modern)</li> <li>• Dedicated non-motorized corridors (Pedestrian walks)</li> <li>• Transport park yards</li> <li>• Agriculture value chain improvement</li> <li>• Solid &amp; liquid waste solutions</li> <li>• Sustainable employment opportunities</li> <li>• Renewable energy</li> <li>• Replace asbestos with iron sheet in Njoro Sub- County hospital</li> </ul>

### Vision

Out of the above analysis and for the purpose of the Njoro USR, this short vision was arrived at;

## "A Well Planned Agricultural and Industrial Town"

### Description of the Vision

Njoro is planned and managed with a holistic perspective, balancing housing, businesses and space for recreation, interaction as well as green areas. Properties are protected for today's and tomorrow's needs of clean water, sustainable transportation and public services. Water is now a well-managed resource that is always available to all citizens.

Men, women and children living in Njoro are able to influence planning processes and take responsibility for the development of their communities.

Our agriculture and industry is competitive and long lasting through sustainable solutions for production and fair rights for employees. In our public procurement we aim to buy local products and the quality of crops and items from our area is well known.

### Objectives, Strategies and Possible Areas of Action





After several Working Group meetings from December 2016 and onwards, the following lists of Objectives, Strategies and Possible Areas of Action within each of the areas of challenges mentioned were identified.

The extracted possible areas of action also provide a good basis to design a Symbio City Urban Solutions Package where the proposed projects the Quick Win and the Change Project are important parts of.

Water and Sanitation

CLUSTER OF CHALLENGES:

**WATER & SANITATION**

OBJECTIVES	 <p>Clean, Safe &amp; Adequate Water</p>	 <p>Equity in Distribution of Water</p>	 <p>Hygienic Toilet System Provision for All</p>	 <p>Sewer System Connection to All and with Treatment Plant</p>
STRATEGIES	<ul style="list-style-type: none"> <li>→ WATER BOUGHT FROM RELIABLE SOURCE</li> <li>→ RAIN WATER HARVESTING</li> <li>→ CONSTRUCTION OF FACILITIES SUCH AS UNDERGROUND TANKS, WATER PANS AND DAMS</li> <li>→ PROVISION OF MORE PUBLIC TOILETS</li> </ul>		<ul style="list-style-type: none"> <li>→ INTRODUCE SAFE AND HYGIENIC DRY TOILET SYSTEM</li> <li>→ WATERBORNE TOILET SYSTEM IN THE FUTURE</li> <li>→ TREATMENT PLANT TO PRODUCE FERTILIZER</li> <li>→ DEVELOPMENT OF THE RIPARIAN AREA</li> <li>→ FOREST AND GREENERY CONSERVATION</li> </ul>	
POSSIBLE AREAS OF ACTION	<ul style="list-style-type: none"> <li>→ Plan for water network</li> <li>→ Construction of water distribution pipe from Mau Forest to Njoro</li> <li>→ Construction of water network and purification/treatment plant</li> <li>→ Advice and support to install rain water harvesting in all buildings</li> </ul>		<ul style="list-style-type: none"> <li>→ Construction of water reservoirs</li> <li>→ Purchase land for treatment plant</li> <li>→ Construct a sewerage treatment plant, include a biogas digester for liquid and solid waste</li> <li>→ Tree and ground cover planting</li> </ul>	

Solid Waste

CLUSTER OF CHALLENGES:

**SOLID WASTE**

OBJECTIVES	 <p>Sustainable Solid Waste Management</p>
STRATEGIES	<ul style="list-style-type: none"> <li>→ ENHANCEMENT OF REDUCING, REUSING, RECYCLING AND RECOVERY OF GARBAGE, 4R</li> <li>→ ENHANCE BIOGAS USAGE</li> <li>→ PRODUCTION OF ORGANIC FERTILIZER</li> </ul>
POSSIBLE AREAS OF ACTION	<ul style="list-style-type: none"> <li>→ Acquisition of land for a landfill</li> <li>→ Acquisition of a refuse truck</li> <li>→ Acquisition of incinerators</li> <li>→ Provision of litter bins and dust bins</li> <li>→ Public awareness through barazas, posters, media and government officials</li> <li>→ 4R in action</li> </ul>



*Roads and Transport*

CLUSTER OF CHALLENGES:

**ROADS AND TRANSPORT**

<b>OBJECTIVES</b>	 All Weather Roads	 Provision for Non-motorised Transport	 Provision of Roads for All, including Children
<b>STRATEGIES</b>	<ul style="list-style-type: none"> <li>→ PROPER ROADS &amp; CONNECTIONS</li> <li>→ BIG ROADS WITH NMT LANES</li> <li>→ BUS PARK, BODA BODA CENTRE</li> <li>→ STREET LIGHTING ON ALL URBAN ROADS</li> <li>→ STREET LIGHTING USING SOLAR AND/OR BIOGAS ENERGY</li> <li>→ REGULAR MAINTENANCE OF ROADS</li> </ul>		
<b>POSSIBLE AREAS OF ACTION</b>	<ul style="list-style-type: none"> <li>→ Functional drainage along the roads</li> <li>→ Provision of road signs &amp; road marking</li> <li>→ Tarmacking/rehabilitation of all roads in Njoro</li> <li>→ Transport and bus park and and body centre developed</li> <li>→ Street lighting arranged along all roads in Njoro</li> <li>→ Plan and build roads with NMT lanes</li> </ul>		

*Culture and Recreation*

CLUSTER OF CHALLENGES:

**CULTURE & RECREATION**

<b>OBJECTIVES</b>	 Rich cultural life for everybody	 Sport and recreation activities available for all
<b>STRATEGIES</b>	<ul style="list-style-type: none"> <li>→ YOUTH EMPOWERMENT</li> <li>→ CULTURAL CENTRE DEVELOPMENT</li> <li>→ CREATE DEFINED PUBLIC SPACE</li> <li>→ DEVELOPMENT OF SPORT CLUBS AND AREAS</li> <li>→ DEVELOPMENT OF HOSPITALITY SECTOR</li> </ul>	
<b>POSSIBLE AREAS OF ACTION</b>	<ul style="list-style-type: none"> <li>→ Plan and build public spaces</li> <li>→ Develop cultural, social and recreational centres</li> <li>→ Develop sport clubs, fields and amenities</li> <li>→ Build children playgrounds</li> <li>→ Revive and establish hotels, restaurants and clubs</li> </ul>	

Unemployment

CLUSTER OF CHALLENGES:

**UNEMPLOYMENT**

OBJECTIVES	<div style="display: flex; justify-content: space-around; text-align: center;"> <div data-bbox="416 519 531 630">  <p>Youth Empowerment</p> </div> <div data-bbox="560 519 674 630">  <p>Community Empowering Economically</p> </div> <div data-bbox="703 519 818 630">  <p>Promote Sport Activities &amp; Development</p> </div> <div data-bbox="847 519 961 630">  <p>Promote Development of AgroIndustry</p> </div> <div data-bbox="990 519 1105 630">  <p>Enhance Commercial Services for Education Sector</p> </div> <div data-bbox="1134 519 1248 630">  <p>Develop Njoro as Satellite town to Nakuru</p> </div> </div>
STRATEGIES	<ul style="list-style-type: none"> <li>→ INDUSTRIES ADDING VALUE TO AGRICULTURAL &amp; HORTICULTURAL PRODUCE</li> <li>→ DEVELOP HOSPITALITY INDUSTRY</li> <li>→ ENHANCE THE SERVICE FOR EDUCATIONAL INSTITUTIONS</li> <li>→ PROMOTE INDUSTRIES FOR TURNING WASTE INTO ASSETS</li> <li>→ VOCATIONAL TRAINING</li> <li>→ ENTREPRENEURSHIP TRAINING</li> <li>→ COTTAGE INDUSTRIES DEVELOPMENT</li> <li>→ MAKE NJORO A MARKET HUB FOR AGRICULTURAL PRODUCE</li> <li>→ CREATE SPORT CENTRES</li> </ul>
POSSIBLE AREAS OF ACTION	<ul style="list-style-type: none"> <li>→ Start an incubator programme</li> <li>→ Proper marketing of agricultural products</li> <li>→ Enhance the milling industries</li> <li>→ Recycling of waste products</li> <li>→ Tourism and hospitality industry development</li> <li>→ Build sporting grounds</li> <li>→ Promote the construction industry</li> <li>→ Develop the milk processing industry</li> <li>→ Create a transport and bus park</li> <li>→ Enhance the shopping environment</li> <li>→ Develop rehab and old peoples home</li> </ul>

## Priority Area

### Water and Sanitation

<b>Goal: Provision of Clean, Safe and Adequate Water in Njoro Town</b>			
<b>Quick Win: Sustainable Water Management with Water supply and storm water Drainage in Jowatho Informal Settlement, Njoro Township</b>			
<b>Change Project: Sustainable Water Management in Jowatho Informal Settlement</b>			
<b>Objectives</b>	<b>Activities</b>	<b>Inputs</b>	<b>Outputs</b>
Access to clean and safe water	<ul style="list-style-type: none"> <li>Rehabilitating existing borehole</li> <li>Water harvesting</li> <li>Pre-treatment of water</li> <li>Feasibility study on water access &amp; use</li> </ul>	<ul style="list-style-type: none"> <li>Funds</li> <li>Human resource</li> <li>Equipment</li> <li>Storage facilities</li> </ul>	<ul style="list-style-type: none"> <li>Increased water quantities</li> <li>Improved quality of water</li> <li>Improved health standards</li> </ul>
Improve hygiene and sanitation	<ul style="list-style-type: none"> <li>Sensitizing the community on WASH</li> <li>Constructing ECO-SAN toilets</li> </ul>	<ul style="list-style-type: none"> <li>Funds</li> <li>Education info. Materials</li> <li>Disinfectants</li> <li>Hand wash facilities</li> </ul>	Improved health and general hygiene
Lower incidences of water borne diseases	<ul style="list-style-type: none"> <li>Health education</li> <li>Water treatment</li> </ul>	<ul style="list-style-type: none"> <li>Edu. info. materials</li> <li>Disinfectant (chlorine tablets)</li> </ul>	Reduce waterborne diseases
Reduction of time spent fetching water	<ul style="list-style-type: none"> <li>Constructing more water points e.g. (kiosks, borehole)</li> <li>Increasing reticulation system</li> </ul>	<ul style="list-style-type: none"> <li>Funds</li> <li>Equipping water system</li> <li>Human resource</li> </ul>	Increased number of water points
Encourage urban agriculture	<ul style="list-style-type: none"> <li>Encourage est. of kitchen gardens</li> </ul>	<ul style="list-style-type: none"> <li>Education material</li> <li>Funds</li> <li>Tools and equipment's</li> </ul>	<ul style="list-style-type: none"> <li>Increased food production</li> <li>Improved health status</li> </ul>

# Appendices

## Appendix 1: Working Group Composition

S/No	NAME	Organization/ Designation	Contact
1	Maina Bernard	CO Lands	0727242254
2	John Kamau	Senior Housing Officer NCG	0725445134
3	Naomi Morang'a	Physical Planner NCG	0702973466
4	Moses Kahiga	Land Surveyor NCG	0725941463
5	Solomon Mbugua	GIS Officer NCG	0722279025
6	George Kung'u	Environment Officer Njoro	0732223668
7	Agnes Wakesho	Public Health Officer – Njoro	0721649529
8	Emma Angwenyi	Economic Planner CGN	0725155482
9	Samuel Thuo Gatharia	Water Officer - Njoro	0723719228
10	John Icigo Kamau	Elder, Njoro	0727828283
11	Gilbert Nyoro Ndungu	Business Community	0721893511
12	Rufus Muchiri	Bodaboda Operators	0713051035
13	Benard Mwathi Macharia	Ward Admin. -Njoro	0720372493
14	Hannah Wanjiku Mwangi	Market Rep	0714452696
15	Antony Wanyiri Wakahora	Youth/MCA Rep	0725689550
16	Martin Chege	Youth Rep	0798757075

## Appendix 2: Steering Committee

S/No	NAME	Organization/ Designation	Contact
1		County Secretary (Chairman)	
2		Chief Officer, Dept. of Land, Housing and Physical Planning (Secretary)	
3		CEC, Dept. of Finance & Economic Planning	
4		CEC, Dept. of Land, Housing and Physical Planning	
5		CEC, Dept. of Water, Environment & Natural Resources	
6		CEC, Dept. of Transport and Infrastructure	
7		Sub-County Administrator, Njoro	
8		Chairperson – County Assembly of Nakuru, land, Housing & Physical Planning Committee	
9		Chief Officer, Dept. of Water, Environment & Natural Resources	

## Appendix 3: Mapping Checklist

<b>COUNTY GOVERNMENT OF NAKURU</b> <b>Department of Planning</b> <b>Njoro SymbioCity Project</b> <b>Participatory Mapping Exercise</b> <b>Village Boundaries</b>		
Mapping ID	Attribute Information	
	Name of Village/Neighbourhood	
	Average land holding ,	
	Dominant shelter type (1=permanent, 2= semi permanent,3= temporary),	
	Dominant dwelling size (Number of bedrooms)	
	Main source of water,	
	Frequency of water availability	
	Main method of faecal disposal	

## Appendix 4: Layers mapped and attribute information Collected

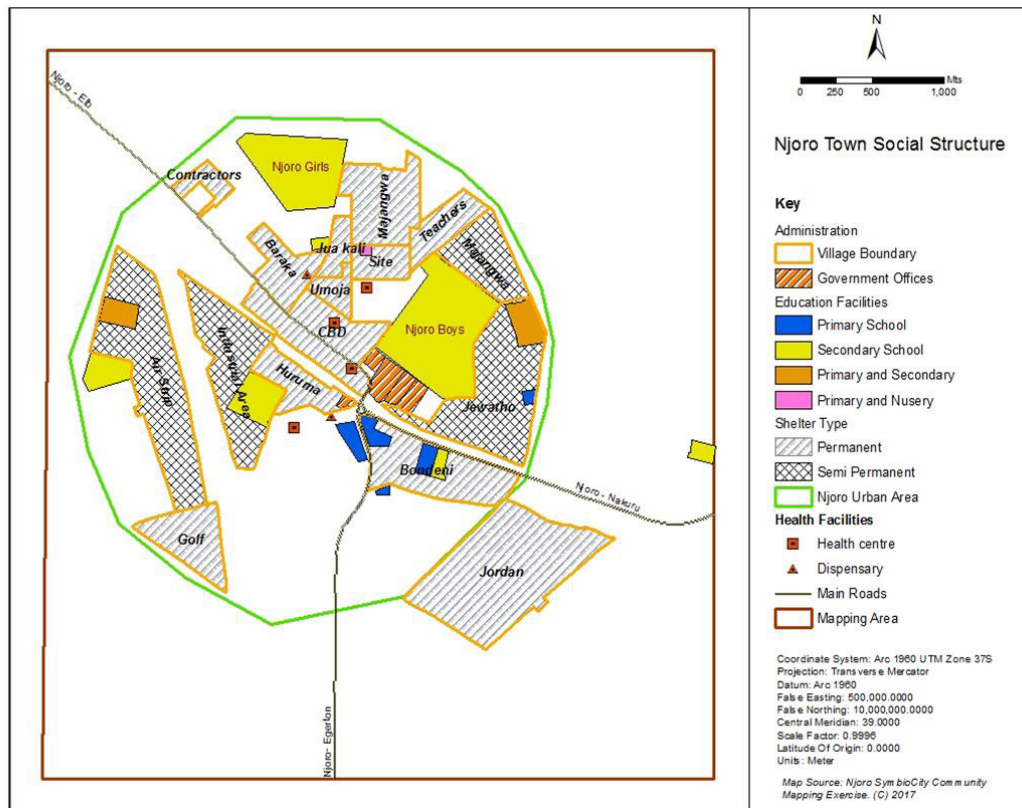
Category	Layers	Description	Information required
Adminis- tration	Administrative boundaries	Sub-location boundaries	Name of sub-location
	Village/neighbourhood Boundaries	Village or Neighbourhood Boundaries as perceived by residents	Village name, Average land holding, Dominant shelter type (permanent, semi- permanent, temporary), Dominant dwelling size, Main source of water, Frequency of water availability, Main method of faecal disposal
	Govt & NGO Offices	Show location of Government, NGO and parastatal offices	Name of office, sector to which it belongs, level in hierarchy of administration
Security	Crime spots	Show spots where crime is prevalent	Name of spot, Type of crime, Month it happened (focus on last 6 months)
	No-go areas (insecure areas)	Areas that people fear to go to due to insecurity	Map No-go-Areas, mention risk time (whether day or night)
	Street lights	Location of street light masts	Source of power,(electric or solar) source of funds, status
Education	Schools	Learning institutions – NGO, private or Govt	Name of institution, type/level and sponsorship - (include vocational training centres)
Health	Hospitals	Show location of health facilities – Govt., NGO, Private	Name, type, sponsorship; Availability of laboratory, pharmacy, maternity, MCH, VCT, ARV or services
	Health hazards	Locate Environmental & health hazards	Type of hazard - (flood areas, quarries, dumpsites, fault lines, open defecation)
Water	Water pipes	Water reticulation network	Pipe segments, ownership and point of frequent water leakages
	Boreholes	Underground water sources - (include wells, springs)	Name, ownership, serves public? condition or status – if working or not,
	Water kiosks	Communal water points	Exact location of water points, sources of funds used to set up facility and main source of water

Category	Layers	Description	Information required
Social Services	Community Projects	Projects funded by CDF, County Govt. or National Govt,	Name, Source of funding, current status (completed, ongoing, abandoned)
	Open Areas	Grounds reserved for public use	Name, reserved use, current use and status
	Social Halls	Enclosed areas reserved for public use	Name, reserved use, current use and status
	Religious centres	Mainstream worship centres with social activity programs	Name of institution, programs offered
	Rescue and Care Centres	Children, Old peoples' homes, Rescue Centres	Name, sponsor – (Govt., NGO, community or private)
	Venerable households	Households suffering extremes poverty, disease or disability	Type of venerability
Com-merce	Factories	Location of formal and informal industries,	Name, category, raw materials used, main product, main bye product, target market
	Markets	Location of formal and informal markets	Name, category, main products sold, open days
Transport	PSV Yards	Location of formal and informal Public Services Vehicles and boda boda stages	Name of stage, main type vehicle, (PSV, boda, lorry, name of SACOS operating at the stage



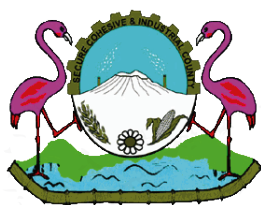
## Appendix 5: Mapping Output/Report

### A Map Developed as a result of the Mapping Exercise



Appendix 6: A photo during the mapping exercise





COUNCIL OF GOVERNORS



Embassy of Sweden  
Nairobi

 **SKL International**  
AFFILIATED TO THE SWEDISH ASSOCIATION OF LOCAL AUTHORITIES AND REGIONS



Swedish Association  
of Local Authorities  
and Regions