

# **KENYA'S EXPERIENCE ON URBAN HEALTH ISSUES**

## **FINAL REPORT ON THE *Urban HEART* PILOT-TESTING PROJECT**

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## List of acronyms

CID	Criminal Investigation Department
MOPHS	Ministry of Public Health and Sanitation
MOWI	Ministry of Water and Irrigation
MOE	Ministry of Education
KNDS	Kenya National Demographic Survey
MOPLND	Ministry of Planning and National Development
MOF	Ministry of Finance
NAKUINFO	Nakuru Information Center
KCBS	Kenya Central Bureau of Statistics
ECK	Electoral Commission of Kenya
MOGCSS	Ministry of Gender, Culture and Social Services
COL	Commission of Land
KEPI	Kenya Expanded Program on Immunization
NACADA	National Anti Narcotic and Drug Abuse
KNNS	Kenya National Nutritional Survey

## **Abstract**

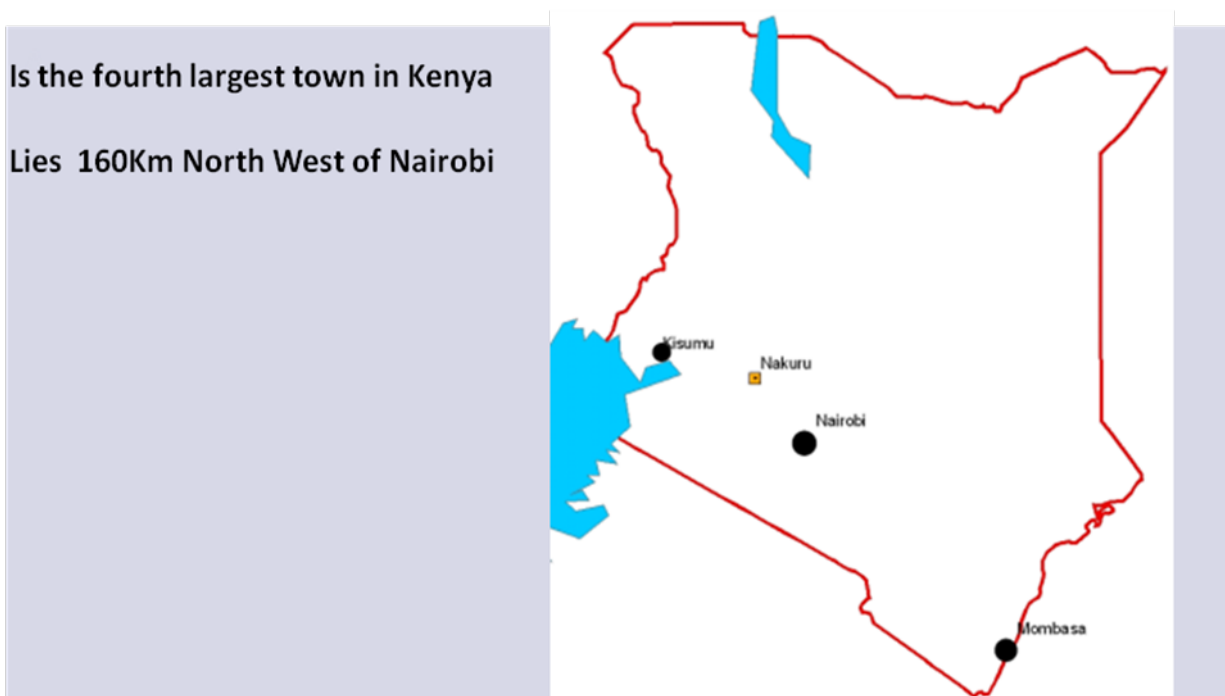
The WHO's Urban Health Equity Assessment and Response Tool (Urban HEART) was taken to the full municipal council meeting of Nakuru, Kenya, on Saturday, 3 March 2009, and was unanimously adopted for implementation. The task was to pilot-test Urban HEART to assess and analyze health equity in two wards of Nakuru, and to report the results. Recommendations for improving the tool and addressing healthy equity challenges were also generated. The health disparities have been indicated in the report showing weaknesses as well as opportunities and strengths that can be leveraged to improve the lives of Kenyans living in the two wards and possibly beyond. We believe the local authority has the potential for implementing the recommendations given herein.

## 1.0 Introduction

### 1.1 Background on Nakuru, Kenya

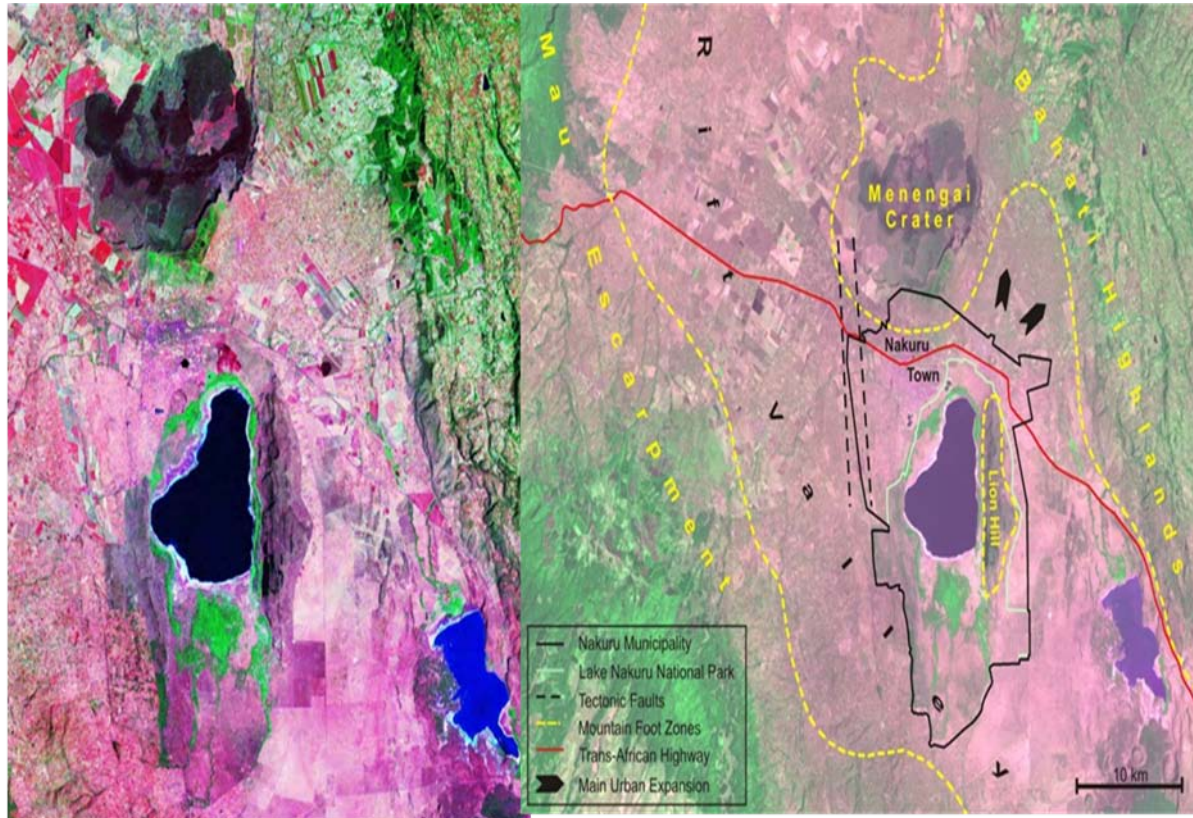
Nakuru, the capital of Kenya's Rift Valley Province, is located 160 kilometres northwest of Nairobi, along the Kenya-Uganda highway, at an altitude of 1800 metres (Fig. 1). Founded by the British colonial authorities at the beginning of the 20th century as a station along the Ugandan Railway, Nakuru later became a service centre for a fertile agricultural hinterland occupied by white settlers. Large ranches and farms can still be found on the western and south-eastern sides of town, some of them still being owned by settlers, others having been turned into limited companies specializing in dairy farming, meat and horticultural production. The town's industry is mostly related to the agricultural sector. Milling, tanning, oil refining and agro-products cover the bulk of the secondary sector, together with textile and soap manufacturing.

**Figure 1. Map showing Nakuru's location**



The town is sandwiched between the scenic Menengai Crater to the north and the Lake Nakuru National Park to the south (Fig. 2). The latter is famous for its rich variety of fauna and flora. Its central location along the Kenya-Uganda railway and the Trans-African Highway and the fertile agricultural hinterland are some of the significant factors that have influenced the town's growth.

Figure 2. Imagery showing Nakuru and its surrounding areas



The town has witnessed a tremendous increase in its population over the past three decades. Migrants from rural areas often settle in already overcrowded informal settlements mainly in Rhoda Ward. This has led to an increase in demand for basic services and infrastructure such as housing, water and sanitation, and roads, among many others. This in turn has put a strain on the available resources, and increased challenges to the municipal council to meet the needs of the town's inhabitants.

Nakuru enjoys a diversity of geographical and ecological features. To the south, adjacent to the town, is Lake Nakuru National Park, a wetland of global significance; to the west is the Mau Escarpment, a water tower of regional significance; and to the north is the extinct 12 km wide Menengai crater, one of the largest of its kind in the world.

Lake Nakuru National Park is under increased pressure from Nakuru town. The last rows of houses in the informal settlements in Rhoda are literally leaning against the electrified fence surrounding the park. Poor management of solid waste and lack of control of surface run-off pose a serious ecological threat to River Njoro and to the lake's ecosystem.

### 1.1.1 Demography

There has been a tremendous increase in population growth in Nakuru over the last couple of decades. There were 163 927 persons in 1989 and 231 000 in 1999. Population growth is expected to continue with an annual growth rate per year of 3.8% (Fig. 3).

The current population is estimated at 500 000 with those under 18 years of age accounting for 54% of the population and children under five years accounting for 16%.

Nakuru's municipal boundaries were expanded from encompassing 32 square kilometres in 1952 to 78 square kilometres in 1978. They were further expanded to include Lake Nakuru National park and the peri-urban agricultural settlements to the southwest of the town for a total area of 290 square kilometres in 1992. Of the total area, 56 square kilometers are urbanized, 32 square kilometers are predominantly agricultural, and the remaining 202 square kilometers is the national park.

**Figure 3. Estimated population growth rate of Nakuru, Kenya, from 1989 to 2020**

Year	1989	1995	2000	2005	2010	2015	2020
	163 927	213 954	258 724	312 861	378 328	457 495	553 223

Source: Nakuru Strategic Structural Plan 2003

### 1.1.2 Administration and political set-up

Nakuru's municipal boundary is identical to that of the Nakuru Municipality Division. The division is divided into five administrative locations: Lanet, Afraha, Kaptembwa, Baharini and Barut. The municipality has fifteen Civic Wards: Lanet, Menengai, Afraha, Hospital, Industrial-Area, Shabab, Kaptembwo, Rhoda, Langalanga, Lake-View, Shauri-Yako, Bondeni, Kivumbini, Barut-East and Barut-West. The latter two are rural and predominantly agricultural.

Settlement fabrics are sections/areas within the urban area that possess general consistency in their character and form. This consistency need not be in all aspects of the settlement but should at least be found in as many key components as possible. Secondly, they need not be situated in close proximity to each other but may be located on opposite sides of the town, far from each other.

The different fabrics and settlements are noted as having varying problems and potentials. In each of them, there is need for planning and management interventions to increase efficiency of space use and to create logic in the internal linkages and relationships between various components of the fabric.

As a case study for the implementation of the Strategic Structure Plan proposals, and in line with the three track mode of the Strategic Structure Planning process, a project for the reorganization of Flamingo I Estate is currently in place. The other principal action is the re-organization and restructuring of these areas to become more integrated into the global town.



## 1.2 Objectives

- To raise awareness of the people on health inequities in two wards of Nakuru.
- To create and improve physical, social and environmental conditions in the two wards.
- To mobilize people to mutually support each other through inter- and intra-sectoral collaboration.
- To sensitize and exploit the full potential within the municipal council, to perform all functions necessary to sustain people's quality of life.

## 1.3 Aim of the survey

The survey is aimed at analyzing differences in health opportunities between residents of Langalanga and Rhoda Civic Wards with a view to identifying viable and effective strategies that could be used to reduce health inequities in the municipality.

## 1.4 Assumptions

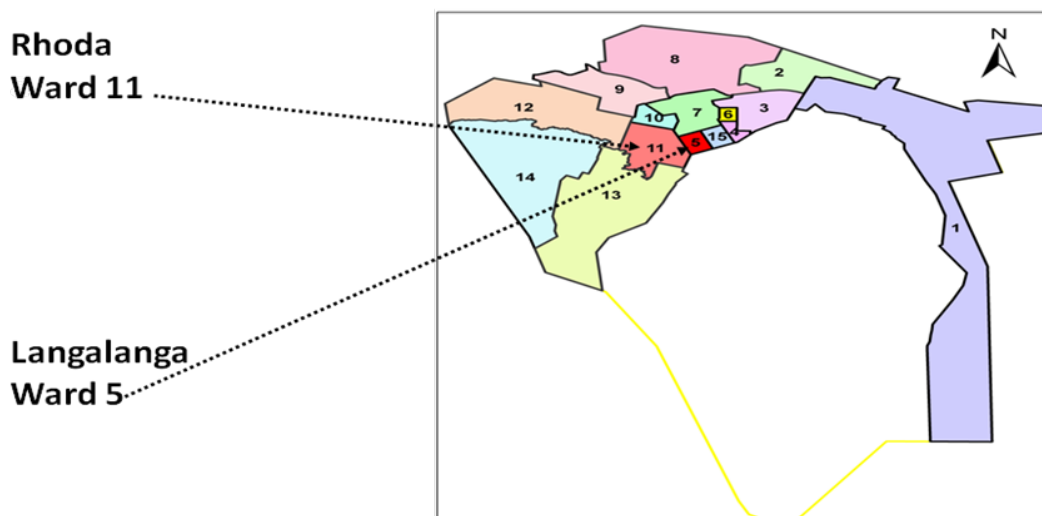
- High political commitment, intersectoral collaboration and community participation exist.
- A city health profile has been developed and data are available for analysis.
- Physical and virtual network are in existence for the generation, analysis and dissemination of information.

## 2.0 Methodology

### 2.1 Study area

Nakuru comprises 15 civic wards, each of which has a unique history and characteristics. Each ward has a name and is assigned a unique identification number. Langalanga and Rhoda Civic Wards, the two wards in which Urban HEART was piloted, are situated in the northwestern side of Nakuru town (Fig. 3).

**Figure 3. Map of Nakuru civic wards including Rhoda and Langalana**



Langalanga Ward covers an area of 0.8 square kilometres and is made up of Racetrack, Langalanga I, II, and Langalanga III estates. It has a population of 10 926 inhabitants. It borders Biashara Ward to the north along KANU Street and Lakeview Ward to the east along Mashindano Street. It shares a boundary with Rhoda to the west along Baringo Road and Lake Nakuru National Park to the south.

Langalanga falls within Zone 1 of the municipal planning units and its development is supported by infrastructure such as roads, electricity and a network of grid-pattern-like roads providing efficient access to residential areas even during wet seasons. Though predominantly residential and without a market, Langalanga is adequately served by a well established residential-cum-commercial centre providing business premises for retail and service shops.

Langalanga offers a wide range of dwellings including permanent one bed-room to multiple bed-room high-rise houses with water infrastructure and organized systems of refuse collection. Rent costs in this ward range from 5000 to 15 000 Kenyan shillings (US\$ 60-180) per month and attracts tenants of middle-income level.

Residents of Langalanga have easy access to health care and walk a maximum of 500 metres to Langalanga Health Centre providing curative, investigative, preventive, antenatal and maternal child health care at subsidized costs.

Pre-primary and primary education services are available in Langalanga. There are 3 government-aided primary schools and 2 privately run primary schools. Enrollment in public primary schools currently stands at 3526 pupils represented by 1826 boys and 1700 girls with a classroom density of 49 pupils per class. The maximum travel distance to a public school in this ward is 500 metres.

Rhoda Ward covers 4.2 square kilometres and consists of Rhoda and Mwariki estates. It borders the upper-middle-income level Shabab Ward to the north, Langalanga Ward to the east, the agrarian Baruti East Ward along River Njoro to the south, and the low-income settlement of Kaptembwo Ward to the west.

Development control in Rhoda Ward is non-existent. Housing development is haphazard and does not take into account required standards, disregarding essential social, aesthetic, environmental long-term impacts on the inhabitants.

The area is dominated by randomly developed temporary dwellings, often as many as 30 single rooms on a plot, often without sufficient toilets, electricity or water. House rent ranges from 300 to 1800 Kenyan shilling (US\$ 4-24) a month.

Poor access to water for domestic consumption is a problem affecting vast areas of the municipality. Households in Rhoda, though connected to the water distribution network, have dry taps most of the time and have to rely entirely on private water vendors.

A majority of roads in Rhoda are earth or gravel and without storm water drains making them impassable during wet seasons. During heavy rains runoffs damage physical structures, especially toilets and weak buildings.

Though Rhoda is home to the severely underutilized Njoro Sewerage Works, disposal of human waste in this ward is mainly through pit latrines. Waste is disposed into open drains leading to blockage and unhealthy living conditions.

The ward is well served with electric power grids but the cost of installing electricity is still unaffordable for a majority of landlords in Rhoda. Many of them struggle to cope with water and sanitation infrastructure problems and perhaps are without an idea about how to deal with electricity bills in the mainly communal dwellings.

Markets are provided by the council. Wakulima and Top Market are the main wholesale and retail markets, respectively, and are located at the Central Business District in Afraha Ward.

Other markets are in Lanet, Bodeni, Langalanga and Shabab Wards but none have been provided in Rhoda Ward. Residents carry out business activities, mainly sale of grains, vegetables and cooked food, by the roadside and along electric power way-leaves, which are subjected to the vagaries of weather, insecurity and lack of sanitary facilities.

Provision of social services and amenities is under the Department of Social Services and Housing of the Municipal Council of Nakuru. There are a number of social halls and smaller sports grounds in residential areas in planned zones but these are totally lacking in the low-income settlements.

Public health care facilities are conspicuously absent in Rhoda. Residents walk a minimum of 3 kilometres to the nearest municipal clinic and a further 2 kilometres to Langalanga Health Centre or the provincial general hospital for laboratory tests.

Rhoda Ward has four public primary schools - Mwariki, Kibowen, Heshmia and Eileen Gochoch with an enrollment of 4 040 pupils (1975 boys and 2065 girls). Classroom density in this ward stands at 48 and compares well with the municipal average of 47. However, on average, pupils in Rhoda walk longer distances to school (minimum of 1 kilometre) due to the vastness of the ward and the skewed distribution of public schools.

## **2.2 Organization and implementation of the survey**

The survey was coordinated by a consultant with the support of two officers and carried out within five days by a team of four research assistants from Egerton University and Moi University, respectively. The survey questionnaire is included in Appendix 1 of this report.

## **2.3 Survey samples**

Sampling was done on the basis of geospatial land data existing at the Nakuru information office. A random sample of plots were drawn using SPSS based on the unique plot identification numbers in the database. Fifty plots each were randomly selected from the 1300 plots in Langalanga and from the 2099 in Rhoda Ward, respectively.

These samples of plot identification numbers were spatially linked to the land parcel map using the plot numbers as the unique identifier. The samples were loaded to a map project and overlaid with high resolution satellite images of the two study areas and printed at a small scale of 1:25000. From the satellite image, roads and plot boundaries and associated developments were clearly visible.

Research assistants, having been trained on map reading techniques, used the paper maps to trace sample plots and conduct interviews. One of the sampled plots in Langalanga was found to be under construction and, hence, unoccupied. Another was a non-residential lot. This resulted in a reduction of the sample of plots to 48.

In Rhoda, two of the sampled plots were found to have merged, and a third had been abandoned, reducing the sample of plots to 48.

## **2.4 Data entry and analysis**

The database containing the survey data was created in SPSS. Major parts of the analysis were conducted in this application, though some analysis was done in Microsoft Excel. All the survey data were converted into geospatial data for further analysis.

Cross-tabulations were used to assess urban health inequities in the two study areas. Selected results are illustrated in this report using charts, graphics and maps.

## 2.5 Photo documentation



Councilor Rispa Ouma,  
contributing towards a discussion



Government Chief Public Health  
Officer, Kepha Ombacho (left), and  
Engineer Ndegwa, WHO  
representative (right).



Consultant for the project and the  
Chief Public Health Officer of  
Nakuru Municipal Council consulting  
during workshop in Nakuru.



Chief Public Health Officer consulting during workshop in Nakuru.



Councilors present.



Officials of various government ministries.



The project consultant with data collectors during sensitization workshop.



Dr Jacob Kumaresan, Director of the WHO Kobe Centre (second from left), with the National Steering Committee of Urban HEART while visiting Kenya.



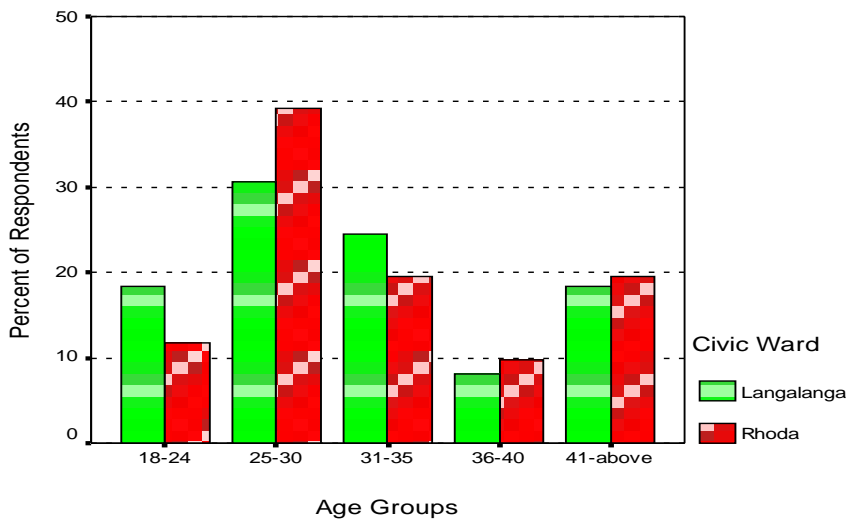
Dr Jacob Kumaresan with the representative of the Chief Public Health Officer in his office in Nairobi, Kenya.

### 3.0 Research findings

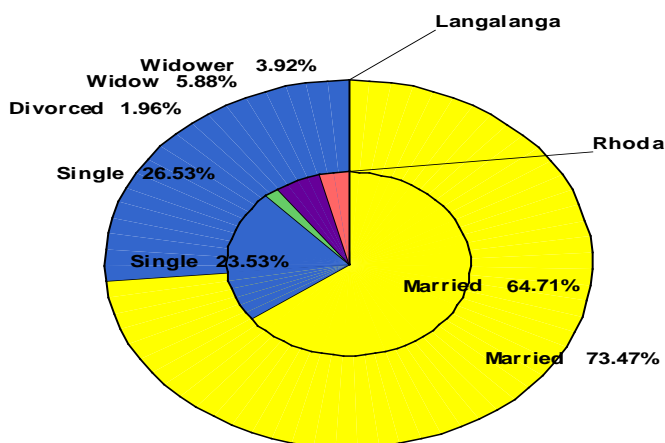
#### 3.1 Respondents background

The bulk of respondents were individuals found at their homes. Attention was given, on the one hand, to have a good gender representation and, on the other hand, to follow guidelines on respondent selection. In spite of this, men were not satisfactorily represented. More than two-thirds (67%) of the respondents from either ward were women. Many of these (56% in Langalanga and 64% in Rhoda) were aged between 25 and 35 years (Fig. 4). These are relatively young people involved in their reproductive years who might also play an important role in decision-making processes. A majority of them (72% in Langalanga and 58% in Rhoda) were married (Fig. 5).

**Figure 4. Age distribution of survey respondents in Langalanga and Rhoda**



**Figure 5. Marital status of survey respondents in Langalanga and Rhoda**



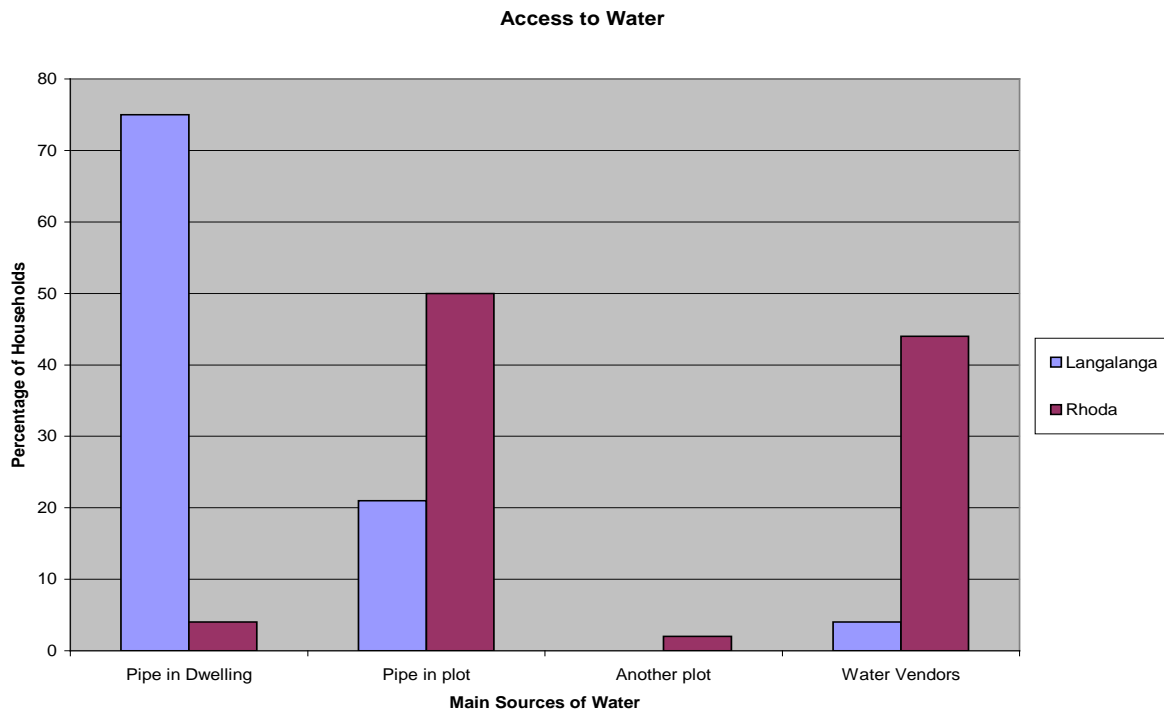


### 3.2 Water

Nakuru town gets its water from both surface and sub-surface/underground water sources currently operated and maintained by the Nakuru Water and Sanitation Services Company (NAWASSCO) and supplemented by private and community boreholes.

Chronic shortages affect mainly the low-income settlements in Kaptembwo Rhoda and Lanet. In Rhoda only 4% of the residents have a regular water supply; 46% rely on water vendors and buy water at 20 Kenyan shillings for 20 liters (Fig. 6).

**Figure 6. Access to water in Langalanga and Rhoda**



Residents in Langalanga Ward enjoy a regular water supply 75% of the households reported having water at their dwellings all the time and only 4% reported buying water from vendors (Fig. 6).

The chemical and bacteriological safety of the water sold by the vendors cannot be ascertained. More so the cost of the water is relatively high compared to the water supplied to dwellings by NAWASSCO.

### 3.3 Human waste disposal

Toilet coverage in Nakuru Municipality is about 87%. Only one-fifth of the municipality (Afraha, Langalanga and Kivumbini Wards) has a sewer network.

Rhoda Ward has 90% toilet coverage and compares well with Langalanga with 98%. A large part of the toilets in Rhoda (89%) are pit latrines compared to 2% in Langalanga. Effectiveness of pit latrines is not guaranteed. They lack privacy in the day and security in the night due to their nature and location. They are difficult to keep clean and some have ill-fitting doors. Households without toilets may be disposing of their waste indiscriminately, posing a danger to the health of the people due to flies and smell nuisance.

Without a sewer network a majority (85%) of households dispose of their waste water onto the streets making the roads impassable and posing a danger to children playing on the streets.

### **3.4 Solid waste management**

Management of solid waste in Nakuru is primarily the responsibility of Nakuru Municipal Council. However, in recent years, private sector entrepreneurs and community-based organizations have increasingly been involved in refuse collection and disposal. The municipality, itself lacking staff and vehicles, only does collection in municipal estates and a small part of the Central Business District.

Refuse collection service in Langalanga is provided by a private firm. Most of the households (87%) have subscribed with the firm and pay 150 Kenyan shillings per month for waste collection. Nearly all (90%) of the households queried reported that their waste is collected at least once a week.

There is no organized system of refuse collection in Rhoda. A majority of households (77%) reported they have no subscription to any refuse collection service. A third (33%) of households have their refuse collected by the landlord or do it themselves.

Lack of organized refuse collection systems in Rhoda has resulted in accumulation of garbage within close range of living quarters posing a great danger to the health of these residents but also to the environment and the aesthetic nature of the estate.

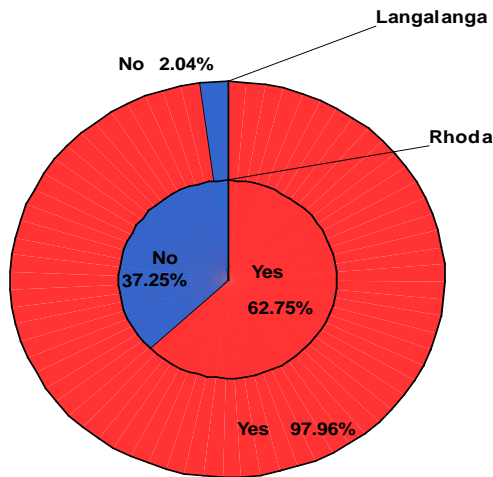
### **3.5 Drainage**

Storm water drainage in the town is mainly dependent on man-made drains, and partially on natural drains. Man-made drains are only to be found in the urban zone of the municipality and along tarmac road such as those in Langalanga.

### **3.6 Electricity**

The main provider of electric power is the Kenya Power & Lighting Company. The cost of installing electricity is still unreachable for a majority of landlords in low-income settlements where the main challenges are water and sanitation. Though power grids transverse a majority of the wards in Nakuru, only about 62% of landlords in Rhoda have installed power into their plots compared to about 98% in Langalanga (Fig. 7).

**Figure 7. Electricity coverage in Langalanga and Rhoda**



### 3.7 Transport

There are about 8 000 bicycle taxis competing for space amongst themselves and with motorized transport in the ever busy and narrow Oginga Odinga Avenue that is the main corridor to Rhoda. Accidents involving motorized and non-motorized transport are frequent in all parts of the town.

### 3.8 Health

Nakuru has a variety of health institutions including a referral hospital, three private hospitals, five health centers and one maternity clinic run by the municipal council, two private nursing homes and over 110 private health clinics. These are well distributed within Afraha, Hospital, Kivumbini and Langalanga Wards but are conspicuously lacking in low-income settlements of Rhoda.

Though morbidity data disaggregated at the ward level are not available, upper respiratory tract infections, malaria and gastroenteritis are the leading causes of illness in Nakuru.

The District Health Management Team - a department of the ministry of health which is responsible for keeping all health-related information and data, including both preventive and curative, and is responsible for monitoring and evaluating health regulations and policy - is the regional advisory body to health providers.

From the department's national data, infant mortality rate is 78 per 1000 live births. Under-five mortality rate is 115 per 1000 live births. Maternal mortality was 414 per 100 000 live births. Life expectancy was estimated at 48 years. Proportion of 1-year old children immunized against measles is 82%. HIV prevalence rate is 7.4% nationally.

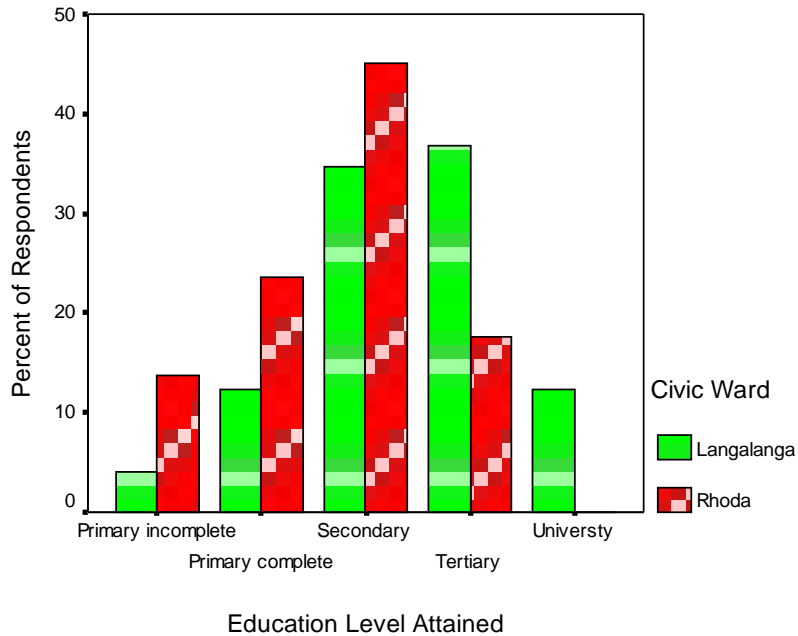
### 3.9 Education

Education services available in Nakuru municipality include pre-primary, primary, secondary and tertiary education. The municipal council and the private sector are the major providers of educational services. There are 60 government-aided primary schools and 45 privately-run primary schools in the

municipality. Enrollment in public primary schools currently stands at 49 607 pupils represented by 24 775 boys and 24 832 girls spread over 1050 classrooms.

Literacy level in the two wards is relatively good compared to national standards. About 85 % of residents have completed basic primary education (Fig. 8). Comparing the two wards, Rhoda has a higher level of illiteracy at 13% compared to Langalanga’s 4%.

**Figure 8. Educational attainment in Langalanga and Rhoda**



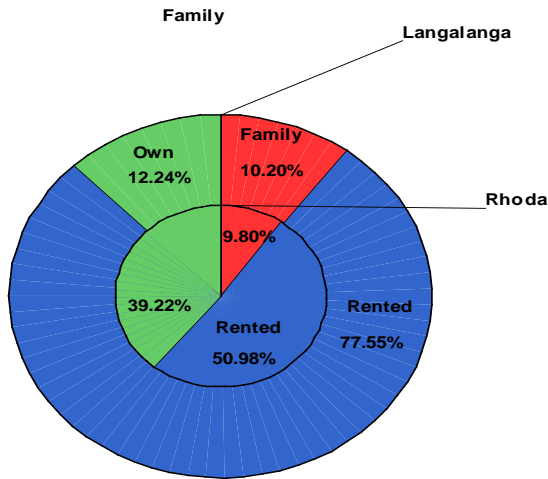
This may point to a possible higher school dropout rate in Rhoda than in Langalanga. Further the survey reveals Rhoda is not a favored neighborhood for people with university education. Even looking at tertiary education, one still finds that twice as many people with tertiary education live in Langalanga than in Rhoda, and twice as many people with little or no formal education live in Rhoda than in Langalanga (Fig. 8).

### 3.10 Housing

There are about 6 956 public housing units within the town, 5 434 of which are owned by the municipal council and 1522 by central government departments and corporations. The rate of growth of the formal housing sector is minimal despite the high population growth.

It estimated that a majority (87%), of Nakuru residents are tenants while a significant 13% own and occupy their own units. Owner occupied housing is prevalent in Menengai, Lanet, and Kivumbini (Naka and Section 58) Wards, all of them middle- and high-income housing areas.

**Figure 9. Home ownership in Langalanga and Rhoda**



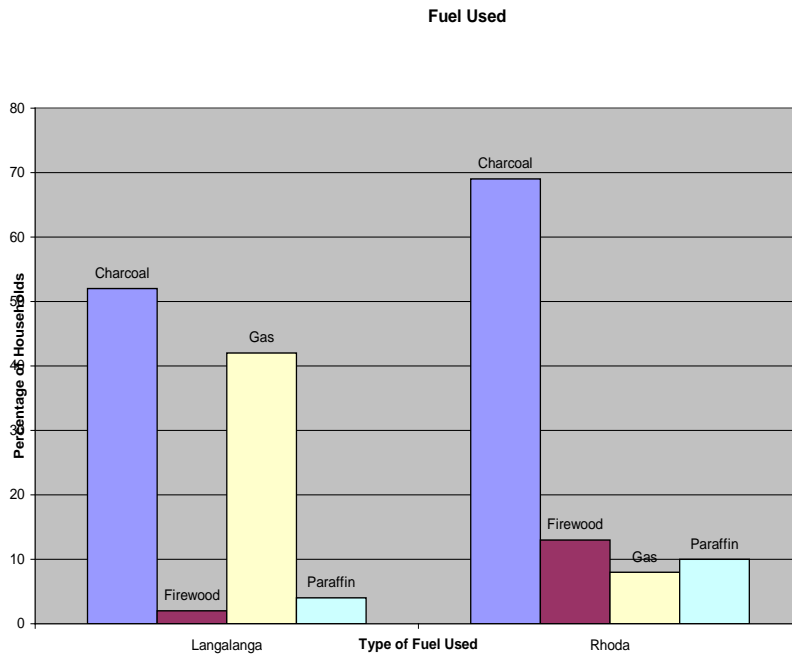
Over three-quarters (77%) of residents in Langalanga live in rented shelter while 23% live in their own or family houses (Fig. 9). In Rhoda, half of the respondents reported living in rented houses. It is not clear how a significant percentage (39%) happened to be occupying their own house in Rhoda. It is possible that landlords live within the plot and prohibit tenants from divulging information. Instead the landlords may have responded to queries regarding the property.

### **3.11 Fuel use**

The main types of fuel used in Nakuru are charcoal, wood and paraffin, and to a small extent Liquefied Petroleum Gas (LPG). Use of electricity is minimal, perhaps owing to the high cost of electricity.

In Langalanga 54 % of residents use charcoal as their main fuel compared to 81 % in Rhoda (Fig. 10). Very few households (8%) are using LPG in Rhoda compared to 42% in Langalanga. Ten per cent of households in Rhoda use paraffin as their major fuel while only 4% do so in Langalanga.

**Figure 10. Types of fuel used in Langalanga and Rhoda**



**3.12 Trade and commerce**

Markets are provided for by the municipal council. Wakulima and Top Market are the main wholesale and retail markets, respectively, and are located at the Central Business District in Afraha Ward. At the moment the markets are congested and business activities are carried outside these premises and along streets in the town.

Other markets are in Lanet, Bodeni, Langalanga and Shabab Wards and none have been provided in Rhoda Ward.

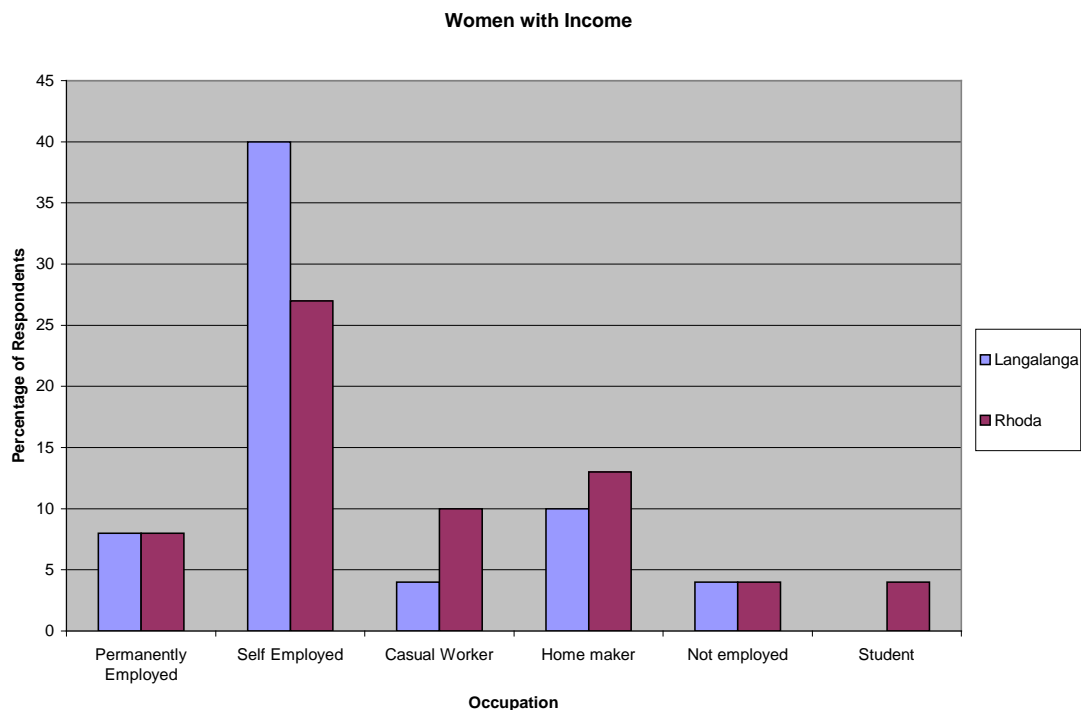
The survey shows that 29% of residents in Langalanga Ward are permanently employed compared to 15% in Rhoda. The survey further reveals that 54% residents in Langalanga are either self-employed or casual workers compared to 63 % in Rhoda.

A casual employee in this context is one finding a wage-paying job at least one day a week. Those without any type of employment were 16% for Langalanga and 23% for Rhoda. This is a big segment of the population without a regular source of income.

**3.13 Women in employment**

The survey reveals that an equally small proportion of women (8%) were permanently employed in both Langalanga and Rhoda (Fig. 11). The proportion of self-employed women was 40% in Langalanga and 27% in Rhoda. The proportion of women without employment, including home-makers, students and the unemployed, were 14% in Langalanga and 21 % in Rhoda.

**Figure 11. Employment status of women in Langalanga and Rhoda**



The informal sector is affected by lack of supportive government policy, space, credit and security among other hindrances. The survey data show that, in spite of this, 40% of women in Langalanga and 27% in Rhoda, respectively, have managed to start and sustain their own business and have sufficient control of their incomes (Fig. 11).

### 3.14 Urban HEART Matrix

The survey results and other data sources (Appendix 2) were used to assess health equity in Nakuru, specifically between Langalanga and Rhoda Wards, using the Urban HEART Matrix (Fig. 12).

**Figure 12. Urban HEART health equity assessment Matrix**

DOMAIN	INDICATOR	WARDS	
		LANGALANGA	RHODA
Physical Environment and Infrastructure	Access to safe water	75	4
	Access to improved sanitation	98	90
	Households with waste collection services	90	27

	Percentage of households using LPG or electric energy	42	8
Social and Human Environment	Literacy rate	96	85
	Births attended by skilled personnel		
	Proportion of 1-year immunized against measles	National figure = 82	
	Prevalence of children on road to health		
Economics	Employment	29	15
	Percentage of women earning an income	48	35
	Proportion of households with income-generating activities	40	27
Governance	Percentage of government spending dedicated to health and education	12.8	
	Voter participation rate	77	77
	Number of developments planned and implemented with the community		
	Net enrollment ratio in primary school		



## **4.0 Response to Urban HEART pilot study findings**

Based on an analysis of the evidence generated from the research in the two locations, the following broad intervention measures are proposed. The responses are aimed at reducing the health inequities revealed by the survey. Some responses may be implemented with local resources. Some require intervention of government departments and others require contributions from the private sector and donors.

Various neighbourhoods have community-based movements articulating various development concerns and may be in a position to identify interventions that are a priority or acceptable to their local communities. They may also have resources they could contribute.

Land, shelter, physical infrastructure and services (water, roads, solid waste management, etc.), and social infrastructure facilities (schools, hospitals, etc.), should be provided for the urban population and especially in low-income neighborhoods and in the new settlements emerging in the eastern part of the town.

There is a need for deliberate efforts to increase the number and variety of economic activities with the aim of creating employment opportunities in the peri-urban areas. Improvement of satellite markets by provision of shelter, electricity and water, may play a major role in promoting opportunities for self-employment by the youth and women, thereby reducing dependency.

A comprehensive municipal urban land-use policy to regulate the supply of land for urban development is urgent. Definition of optimum plot coverage, plot ratios and plot sizes to maximize utility of available infrastructure is even more urgent.

The municipal council should forge partnerships with, and provide incentives for, private sector initiatives in the production of infrastructure and services on private land.

### **4.1 Economic development**

Increase in human development activities which form the basis for employment and income-generation, and, by extension, the sustainability of human life, is desirable in Nakuru. The town's economy is dogged by a variety of problems, including inadequate regulations to promote micro-enterprises, affordable credit, business premises, and business education, leading to stagnation of its key service sectors.

Supplying requisite infrastructure to key economic sectors, planning interventions, enhancing capacity, re-organizing space, providing support infrastructure and services such as sheds, social amenities and credit facilities, are favorable steps towards economic development.

Empowerment of women through affordable credit facilities, and provision of business education and incentives to youth, may greatly promote entrepreneurship in the peri-urban areas. Promoting the potential of information and communication technology (ICT) in business modeling and management would be an added advantage for the youth.

## **4.2 Infrastructure**

### **4.2.1 Water supplies**

Residents in low-income settlements in the east and in the north-west of the town bear the brunt of skewed service distribution. They spend a large amount of their time, time that could have otherwise been spent productively, tracking water, yet pay the most for the commodity and suffer the greatest consequences of water-borne and water-related diseases.

Expansion of water reticulation systems in the peri-urban areas, rehabilitation of water reticulation systems and improved routine maintenance may reduce the time, money and consequences of water shortages.

Partnerships between NAWASSCO and community groups to develop and operate water Kiosks and maintain supply and reticulation systems may be a positive step towards water sufficiency in the low-income settlements.

### **4.2.2 Sewage and waste water disposal**

Over ninety-five percent of households in the low-income settlements use pit latrines or soak-away pits to dispose of human waste. This system is often used as an intermediate solution awaiting development of sewer systems. Recommended interventions to improve sanitation in Nakuru are listed below.

- Expand the sewer reticulation to all areas of the town giving priority to densely populated residential areas and newly settled peri-urban areas to fully utilize the available capacity.
- Develop an improved storm water drainage system to reduce excessive floods especially in Mwariki and Rhoda.
- Increase the number of public toilets in the Central Business District and in commercial centres with environment-friendly systems such as the Eco-tact toilets used in Nyayo.
- Encourage participation and partnership between the municipal council, private sector and other stakeholders, in the development, operation and maintenance of public toilets.

### **4.2.3 Storm water drainage**

- Expand the existing storm water drainage system to serve more areas especially those adjacent to the fault line.
- Develop routine maintenance and cleaning of storm water drains.
- Initiate public education and awareness campaigns on safe methods of solid waste disposal.

### **4.2.4 Solid waste management**

- Launch public education and awareness campaigns on safe waste handling and disposal methods at production points.
- Promote waste minimization techniques such as recycling and reuse.
- Improve waste collection systems by building the capacity of community-based organizations and entrepreneurs through credit facilities and by supplying them with appropriate easy-to-service equipment and recruiting experienced personnel.

- Support the entrepreneurs to provide effective services by enforcing municipal bylaws.

#### **4.2.5 Energy and fuel**

- Explore possibilities for developing alternative, cheap and environmentally sound and secure energy sources.

#### **4.2.6 Transportation**

- Provide infrastructure for non-motorized transport modes by constructing bicycle tracks and footpaths, footbridges and tunnels along busy routes.
- Repair roads.

#### **4.2.7 Housing**

- Increase the housing stock through development of new units and redevelopment of existing ones.
- Use of the Floor Space Index (FSI) to allow for higher buildings (apartments) in stable areas can greatly increase the housing provision.
- The municipal council should create an enabling environment for private sector participation in housing production.
- Articulate the national housing policy at local level to spell out the roles of various actors in housing provision.
- Municipal Council of Nakuru to take full responsibility for all developments in the city, especially in the peri-urban areas, and work in conjunction with Nakuru County Council in planning those areas outside its jurisdiction.
- Availing of guidelines on building designs and standards through various channels including the Internet to make it easy for developers and investors to engage with the council.
- Encourage participatory land use planning process to educate the communities on alternative technologies.

#### **4.2.8 Health**

- Develop public health facilities in the low-income areas.
- Encourage religious institutions to participate in health facility development and service provision.
- Encourage disease prevention by improving primary healthcare, personal hygiene and environmental cleanliness.
- Devise effective pollution prevention and control mechanisms at household level and in public places.
- Issue tenure documents to all land parcels occupied by these facilities to protect them from encroachment.

#### **4.2.9 Education**

- Develop public schools in the newly settled peri-urban areas.

- Give incentives to landowners that set aside land for the development of educational facilities, especially in peri-urban areas.
- Encourage and facilitate participation of the private sector, religious institutions and other key stakeholders in the provision of education facilities and services.
- Issue development guidelines to schools for effective use of community-based development resources such as CDF and LATF allocations.

#### **4.2.10 Markets**

- Improve conditions in the existing markets through paving of open-air markets, reorganization of spaces and activities, and provision of support infrastructure and services such as water, electricity, public toilets, solid waste management, etc.
- Open new markets in the densely populated areas, low-income settlements and in newly settled peri-urban areas.
- Issue tenure documents to all land parcels occupied by these facilities to protect them from encroachment.

#### **4.2.11 Recreation facilities**

- Rehabilitate and maintain existing structures and facilities.
- Develop more recreational facilities in densely populated low-income areas.
- Issue tenure documents to all land parcels occupied by these facilities to protect them from encroachment.

### **4.3 Governance and administration**

- Decentralize government and municipal planning and administrative functions to local level.
- Provide information access points on urban development.
- Improve community policing system and devise a feedback system to encourage continued improvement.
- Involve the community in financing the development of facilities within residential areas.

### **4.4 Participatory planning**

There is a need to consider the benefits of involving local communities in plan formulation and implementation processes. This involvement may come in the form of the private sector, non-governmental organizations, community-based organizations and individual citizens in various stages of planning, decision-making and plan implementation. Participatory planning will not only improve the quality of plans, but also improve acceptability of such plans by all stakeholders, and hence the effectiveness of proposals and action plans. It could also be viewed as a means by which resources to finance plan preparation and implementation processes could be raised, thereby reducing the burden of public institutions in shouldering the usually expensive tasks. All in all, participation represents an enhancement of local democracy for the town's people. In Nakuru, this could be achieved through the following:

- The municipal council should strive to provide an enabling environment for the community and other stakeholders to participate in all phases of plan preparation, project formulation and

implementation. The municipal authorities should strive to build partnerships with these stakeholders.

- In the same light, the municipality should consider privatizing some aspects of service provision and play a greater role in facilitating these private initiatives.
- Devise a policy to provide incentives for individuals and organizations which participate in activities that lead to the achievement of the overall goals and objectives of the plan.
- Strengthen the enforcement section of the municipal council to be able to monitor and control urban development.
- Strengthen other departments responsible for service provision by recruiting adequate qualified personnel and by supplying adequate equipment that is appropriate for local conditions.
- Establishment of the Municipal Land Control Board and the Municipal Liaison Committee to scrutinize and approve all subdivisions, change of user, extension of user, extension of lease and building plans in order to improve land management.

## Appendix 1

### Survey questionnaire used for data collection

Enumerator Code	Date of Interview
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Name of Neighborhood	Civic Ward
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#### BACKGROUND INFORMATION

Gender of respondent [1] Male [2] Female

In which age category do you belong?

18-24	25-30	31-35	36-40	41 and above

Indicate your current marital status – *Tick below box*

Married	Single	Divorced	Window/Widower

Please indicate the highest level of education you have attained

Primary incomplete	Primary – complete	Secondary	Tertiary	University

State composition of your household members

	Male	Females
Under Fives		
Children (5-17 years old)		
Youth (18-24 years old)		
Adults 25 years and above		

How many of your children aged over fifteen have completed primary education? .....

How many members of your family possess Birth Certificates? .....

How many of your children are fully immunized? .....

How many of children were delivered in a health facility? .....

What is your present livelihood?

- [1] Permanently employed    [2] Casual worker    [3] Self employed    [4] Not employed  
 [5] Student    [6] Home maker

How long have you lived in this estate?

- [1] Less than 12 months    [2] 1-3 years    [3] Over five years

Is the house you live in rented or owned by you?    [1] Family    [2] Rented    [3] Own

Which is the main type of fuel used by your household for cooking or heating?

- [1] Firewood    [2] Charcoal    [3] Paraffin    [4] Paper    [5] Electricity    [6] Gas

Which of the following correctly describes the type of your house?

- [1] Permanent – (with a foundation and stone wall)
- [2] Semi-permanent – (without foundation but with cement plastered or timber walls)
- [3] Temporary – (without foundation or cement plastered walls or with tin walls)
- [4] Other – (*specify*) .....

Is your house connected to electric power?      [1] Yes      [2] No

What is your household expenditure on the following?

Items	Daily	Monthly
House rent		
Electricity		
Food		
Clothing		
Transport		
Medical expenses		
Water		
Toilet		
Waste Collection		
Others(specify		



What are the sources of income for your household?

Sources	Income in Kshs
Regular Salary	
Spouse contribution	
Support from children and/or relatives	
Support from NGOs/FBOs	
Part-time Employment	
Small Business	
Farming	
Rental income	
Others(specify)	

By what means do you get water for domestic use?

- [1] Pipe in dwelling    [2] Pipe on the plot    [3] Fetch from borehole  
 [4] Buy from vendors    [5] Fetch from another plot

Who collects your household waste for disposal?

- [1] Nakuru Municipal Council    [2] Community Based Organization  
 [3] Household member    [4] Land lord  
 [5] Private firm    [6] Never collected

How often is your solid waste collected by the provider?

- [1] Daily    [2] Twice a week    [3] Once a week    [4] Once a fortnight

Are you a registered voter in your Constituency? [1] Yes [2] No

Did you vote in the last general elections? [1] Yes [2] No

Have you or has any member of your family participated in any community based decision-making process in the last six months? [1] Yes [2] No

How many crimes incidences have happened on this plot in the last three months? .....

Are you satisfied with the action taken over this crime? [1] Yes [2] No

## Appendix 2

### Local indicator set and data sources

#### Policy Domain 1

#### Physical Environment and Infrastructure

Indicator	Definition / concept	Source
Household with access to safe water	Percent of household with level I, II or III connection  <i><u>Number of HHs w level I, II or III connection</u> x 100</i>  <i>Total # of HHs in the Area</i>	MOPHS,MOWI
Household with access to sanitary toilet facility	Percent of household with adequate excreta disposal facilities  <i><u># of HHs with adequate excreta disposal facilities</u> x 100</i>  <i>Total # of HHs in the Area</i>	MOPHS
Household served by city solid waste management syst.	Percent of households served with solid waste management services  <i><u>Number of HHs served by SWM system</u> x 100</i>  <i>Total # of HHs in the Area</i>	NAKUINFO,KNDS
Household using solid fuel (wood, charcoal, paper, etc.)	Percent of households using solid fuel  <i><u>Number of households using solid fuel</u> x 100</i>  <i>Total # of HHs in the Area</i>	MOA,MOENR
Incidence rate of road traffic injuries (fatal and non-fatal)	Number of people injured in road traffic accidents per 100,000 population  <i><u># of people injured in road traffic accidents</u> x 100,000</i>  <i>TP of Area</i>	TRAFFIC POLICE

Policy Domain 2

Social and Human Development

Indicator	Definition / concept	Source
Youth Literacy rate	<p>Literacy rate of 15–24 year-olds, or the youth literacy rate, is the percentage of the population aged 15–24 years who can both read and write with understanding a short simple statement on everyday life (MDG definition).</p> <p><i># of youth 15-24 yo who have attained primary education (can read &amp; write)</i></p> $\frac{\text{_____}}{\text{TP of 15-24 yo in the Area}} \times 100$	KNDS
Elementary completion rate	<p>Percentage of first year entrants who have completed/finished elementary level of education</p> <p><i>Elementary Graduates in School Year N - 1</i></p> $\frac{\text{_____}}{\text{Enrolment in Grad 1 School Year N – 6}} \times 100$	MOE
Health Enrolment Rate	<p>Percentage of families enrolled in NHIF</p> <p><i>Number of families enrolled in NHIF</i></p> $\frac{\text{-----}}{\text{Total number of families in an Area}} \times 100$	KNHDS
Fully Immunized Child	<p>Percentage of infants given BCG, DPT3, OPV3, Measles and Hepatitis B3 vaccine before 1 year old</p> <p><i># of children given 1 dose of BCG, 3 doses each of OPV, DPT and HepaB and 1 dose of anti-Measles vaccine before reaching 12 mos. old</i></p> $\frac{\text{_____}}{\text{3 % of the Total Population}} \times 100$	KEPI

Policy Domain 2

Social and Human Development

Indicator	Definition / concept	Source
Under 5 children moderately to severely underweight	<p>Percentage of children under five diagnosed with moderate to severe form of malnutrition</p> <p><i>Number of children less than 5 years old classified as moderately to severely underweight</i></p> <p>_____ x 100</p> <p><i>TP of Under Five Children in Area</i></p>	KEPI, KCBS
Infants exclusively breastfed until 6 months	<p>Percentage of infants exclusively breastfed until 6 months of age</p> <p><i>Number of infants exclusively breastfed until 6 months of age</i></p> <p>_____ x 100</p> <p><i>TP of 1 year Children in Area</i></p>	KNNS, Census
Prevalence rate of teenage births	<p>Percentage of adolescent girls 15-19y/o with teenage births</p> <p><i>Number of adolescent girls 15 to 19 yrs old with teenage births</i></p> <p>_____ x 100</p> <p><i>TP of Live Births in the Area</i></p>	MOE,MOH,CBS

Policy Domain 2

Social and Human Development

Indicator	Definition / concept	Source
Facility Based Deliveries	<p>Percentage of women giving birth in health facilities</p> <p><i>No of women delivering in Health Centers, Birthing Clinics, Hospitals</i></p> $\frac{\text{No of women delivering in Health Centers, Birthing Clinics, Hospitals}}{\text{Total Population} \times 3.5\%} \times 100$	MOH,PMO
Skilled Birth Attendance	<p>Percentage of births attended by skilled health professional</p> <p><i>No of deliveries attended by skilled health professional (MD, Nurse, Midwife)</i></p> $\frac{\text{No of deliveries attended by skilled health professional (MD, Nurse, Midwife)}}{\text{Total Population} \times 3.5\%} \times 100$	MOH
Prevalence rate of tobacco smoking among 13 to 15 yrs.	<p>Prevalence of tobacco smoking among 13-15yo</p> <p><i>Number of 13 to 15 years old current smokers</i></p> $\frac{\text{Number of 13 to 15 years old current smokers}}{\text{TP of 13-15 youth in the area}} \times 100$	NACADA, MOH

Policy Domain 3

Economics

Indicator	Definition / concept	Source
Employment rate	Proportion of 15-64 youth who are employed  $\frac{\text{Number of people aged 15-64 youth who are employed}}{\text{TP of 15-64 youth in Area}} \times 100$	MOL,KBS
Housing ownership	Percent of household with secure tenure  $\frac{\text{Number of households owned, rented or occupied free with consent of owner}}{\text{Total \# of HHs in Area}} \times 100$	COL
Mean Family Income Expenditure	Total Amount of income of all Households in a given area  $\frac{\text{Total amount of income of all HHs in an Area}}{\text{Total \# of HHs in an Area}} \times 100$	KCBS,MOF, MOPLND
Subsistence Threshold Poverty line  Absolute Poverty	Economic well-being measured by the proportion of people living in absolute poverty, measured using a poverty line of one US dollar per person per day (PPP).  $\frac{\text{Number of households living on \$1/day}}{\text{Total \# of HHs in Area}} \times 100$	MOPLND,KCBS

Policy Domain 4

Governance

Indicator	Definition / Concept	Sources
<p>Government spending allocated to health and other social services (education, housing)</p>	<p>Proportion of budget allocated to health and social services out of total local budget</p> <p><i>Total amount of Budget allocated for health ,education and housing</i></p> <hr style="border: 0.5px solid green;"/> <p style="text-align: right;"><i>x 100</i></p> <p><i>Total amount of budget</i></p>	<p>MOF</p>
<p>Social Participation Rate</p>	<p>Percentage of families with at least one member involved in legitimate people’s organization</p> <p><i>Number of families w a member of a peoples org in an Area</i></p> <hr style="border: 0.5px dashed green;"/> <p style="text-align: right;"><i>x 100</i></p> <p><i>TP of families in an Area</i></p>	<p>MOGCSS</p>
<p>Voter participation rate (national and local)</p>	<p>Percentage of population voting in local and national election</p> <p><i>Number of registered voters who actually voted in local and national elections</i></p> <hr style="border: 0.5px solid green;"/> <p style="text-align: right;"><i>x 100</i></p> <p><i>TP of registered voters</i></p>	<p>ECK</p>
<p>Percentage of Locally generated revenue out of total budget</p>	<p>Percent of local revenue out of total budget</p> <p><i>Total amount of locally generated revenue</i></p> <hr style="border: 0.5px solid green;"/> <p style="text-align: right;"><i>x 100</i></p> <p><i>Total amount of budget</i></p>	<p>TREASURER TO THE COUNCIL</p>



Policy Domain 4  
 Governance

Indicator	Definition / Concept	Sources
Index Crime rate	<p>Rate of index crime per 100,000 pop</p> <p><i>Number of victims of index crimes (violent crimes and crimes against property)</i></p> $\frac{\text{Number of victims of index crimes (violent crimes and crimes against property)}}{\text{TP of area}} \times 100,000$ <p><i>The Crime Index offenses of murder and non-negligent manslaughter, forcible rape, robbery, and aggravated assault comprise the general category of Violent Crime. The Crime Index categories of burglary, larceny-theft, motor vehicle theft, and arson comprise the general category of Property Crime.</i></p>	CID POLICE