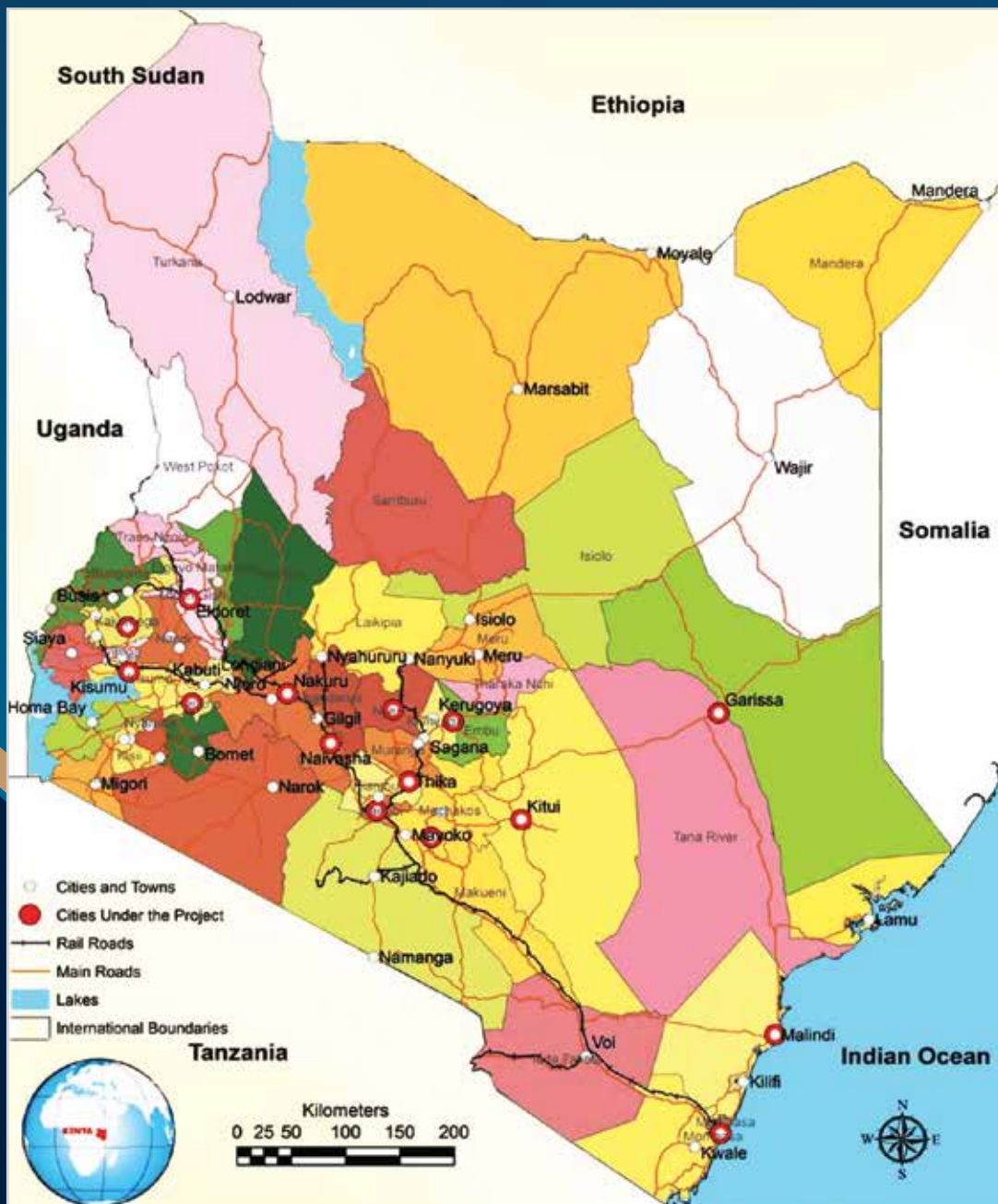


# Kenya

## STATE OF THE CITIES



## NAKURU



WORLD BANK GROUP



# KENYA STATE OF THE CITIES BASELINE SURVEY

STATISTICAL ABSTRACT FOR NAKURU, KENYA



# TABLE OF CONTENTS

---

Abbreviations .....	i
Kenya State of the Cities Survey: Cities Covered .....	ii
Acknowledgements .....	iii
Introduction .....	iv
Background .....	iv
Methodology .....	iv
Questionnaire .....	v
Data Quality .....	v
Table Presentation .....	v
<b>Part A: Household Characteristics .....</b>	<b>1</b>
A.1 Household Demographic Composition .....	1
A.2 Household Education Characteristics .....	2
A.3 Household Health Profile .....	4
<b>Part B: Household Economic Profile.....</b>	<b>5</b>
B.1 Household Occupational Composition.....	4
B.2 Household Income/Expenditure Levels.....	7
B.3 Household Wealth Composition .....	10
B.4 Household Finance.....	11
B.5 Household-Owned Business Profile .....	12
<b>Part C: Dwelling Tenure, Security, and Characteristics .....</b>	<b>13</b>
C.1 Household Dwelling Characteristics .....	13
C.2 Home and Land Ownership.....	15
C.3 Distribution of Housing Values and Rents .....	16
C.4 Neighborhood Social Capital and Civic Participation .....	17
D.1a Water Access .....	19
<b>Part D: Infrastructure Services .....</b>	<b>19</b>
D.1b Water Quality.....	21
D.2a Electricity and Waste-Disposal Services .....	22
D.2b Access to Sanitation Services .....	23
D.3 Access to Transport.....	24
D.4 Access to Communications .....	26
D.5 Access to Infrastructure Indicator .....	26
<b>Conclusions .....</b>	<b>28</b>

## LIST OF TABLES

Table 1: Description of formats used to denote statistical significance .....	vii
Table A.1: Household demographic characteristics .....	2
Table A.2: Household education characteristics .....	3
Table A.3: Household health characteristics.....	4
Table B.1: Household members' main activity .....	6
Table B.2a: Monthly household spending power, as measured by expenditure .....	8

Table B.2b: Monthly household spending power, as measured by income .....	9
Table B.3: Household wealth composition .....	10
Table B.4: Household finance .....	11
Table B.5: Household-owned business profile.....	12
Table C.1: Household dwelling characteristics.....	14
Table C.2: Household residence and land tenure .....	15
Table C.3: Distribution of housing values and rents .....	16
Table C.4a: Neighborhood social capital and civic participation .....	18
Table C.4b: Neighborhood social capital and civic participation .....	18
Table D.1a: Water access .....	20
Table D.1b: Water quality .....	21
Table D.2a: Access to electricity and waste-disposal .....	22
Table D.2b: Access to sanitation .....	24
Table D.3: Access to transport .....	25
Table D.4: Access to communications .....	26
Table D.5: Access to infrastructure indicator .....	27

## LIST OF FIGURES

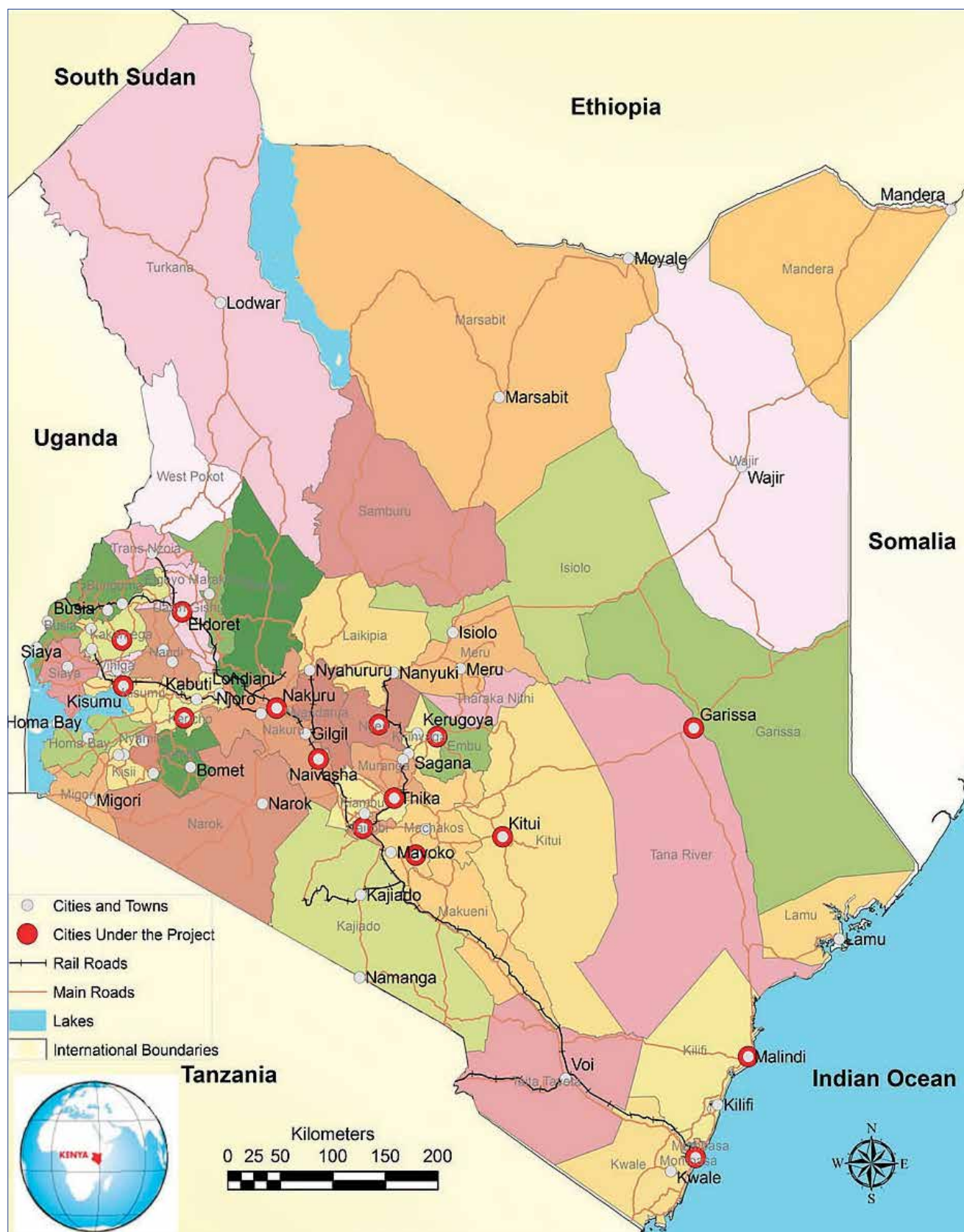
Figure 1: Development diamond .....	28
Figure 2: Infrastructure polygon .....	29
Figure 3: Living conditions diamond .....	29

# ABBREVIATIONS

---

<b>CAPI</b>	Computer Assisted Personal Interview
<b>EA</b>	Enumeration area
<b>GOK</b>	Government of Kenya
<b>HH</b>	Household
<b>HUD</b>	U.S. Department of Housing and Urban Development
<b>KIHBS</b>	Kenya Integrated Household Budget Survey
<b>KISIP</b>	Kenya Informal Settlements Improvement Program
<b>KMP</b>	Kenya Municipal Program
<b>KNBS</b>	Kenya National Bureau of Statistics
<b>NMSP</b>	Nairobi Municipal Service Project
<b>PDA</b>	Personal Digital Assistant, in this case a hand held computer used by interviewers
<b>PSU</b>	Primary Sampling Unit
<b>SMSA</b>	Standard Metropolitan Statistical Area
<b>SRS</b>	Simple Random Sample
<b>SSU</b>	Secondary Sampling Unit
<b>WB</b>	World Bank
<b>WBG</b>	World Bank Group

# KENYA STATE OF THE CITIES BASELINE SURVEY: CITIES COVERED





## ACKNOWLEDGEMENTS

---

The Kenya State of the Cities Baseline Survey was the result of the hard work, dedication, and support of many people. Within the World Bank, the work was coordinated and led by Sumila Gulyani (Lead Urban Specialist) and Wendy Ayres (Senior Economist). The report reflects the hard work of a team of experts from NORC who designed the survey instrument and sampling strategy, collected the data, and prepared the reports. These include Ray Struyk, Sarah Hughes, Sam Haddaway, Santanu Pramanik, Yvonne Cao, and Tasha Heidenrich. Clifford Zinnes of NORC at the University of Chicago oversaw production of all documents, including the statistical analysis and production of tables. Data collection was administered by a Kenyan firm, Infotrak Research and Consulting. Computer programming was in Stata and provided by Aaron Wilson. The Baseline Survey also benefited from the continued insights and guidance and of Ellen Bassett (Professor of Urban Planning, University of Virginia) and Debabrata Talukdar (Professor of Economics, School of Management, University of Buffalo), and from the contributions of Dean Cira, (Lead Urban Specialist), Sheila Kamunyori (Urban Specialist), and R. Mukami Kariuki (Lead Water and Sanitation Specialist).

The team acknowledges the support provided by the World Bank management, in particular Diarietou Gaye (Country Director for Kenya), Thomas O'Brien (Country Program Coordinator for Kenya), and Sameh Wahba (Practice Manager, GSURR). The team also thanks the Peer Reviewers for their support. These include Melanie Walker (Senior Adviser, EXC), Catalina Marulanda, (Lead Urban Specialist, GSU10), and Apurva Sanghi (Program Leader, Kenya).

Support for the preparation of the Kenya Baseline Survey was provided by Elizabeth Karuoya (Program Assistant) and Roderick Babijes (Program Assistant). The team also thanks the report's editor, Tony Sittoni, and graphic designers Paul Chikombe and Robert Waiharo. To them the team extends its gratitude.

The team is grateful for the support of the Government of Kenya at all levels, without which this survey would not have been possible. Especially important were the contributions of the Kenya National Bureau of Statistics, which provided critical inputs into the sample design. The contributions of the team at the Directorate of Urban Development, Ministry of Land, Housing, and Urban Development were also essential. The team wishes to thank the respondents to the survey, who generously contributed their time to enable the survey teams to collect crucial information on the state of the cities in Kenya.

Finally, the team wishes to thank the Government of Sweden, the Cities Alliance, and the Bill and Melinda Gates Foundation for their generous support for the preparation of the Kenya State of the Cities Baseline Survey. Without their support, this work would not have taken place.

# INTRODUCTION

## Background

The Kenyan government, with the support of development partners, is increasing its investments in urban infrastructure and services. To support these efforts, the World Bank has contracted NORC at the University of Chicago to carry out a baseline study of the demographic, infrastructure, and economic profiles of fifteen Kenyan towns and cities: Nairobi City, Mombasa, Naivasha, Nakuru, Malindi, Eldoret, Garissa, Embu, Kitui, Kericho, Thika, Kakamega, Kisumu, Machakos, and Nyeri. This was undertaken in order to deepen understanding of the cities' growth dynamics, and to identify specific challenges to quality of life for residents. The study, called the "Kenya State of the Cities Baseline Survey," collects and analyzes household survey data to produce key statistics and identify differences in conditions among types of households—especially differences between those living in informal versus formal settlements. The ultimate goal is to use the information to establish development priorities for infrastructure and service investments and, eventually, to track the effectiveness of these investments.

Prior to the State of the Cities survey, there were little data available to support the design of programs to improve infrastructure and related services in most Kenyan cities. While there have been several household surveys of Nairobi's informal settlements and numerous analyses using the data, few surveys or analyses have been carried out in other Kenyan towns and cities or for modest-income areas in Nairobi.

To facilitate access to the rich datasets generated by the survey, three written products were commissioned: a Statistical Abstract (such as this one) for each city, a City-at-a-Glance for each city (a two-page summary of the Abstract), and an Overview Report (a more comprehensive discussion of the topics in this Introduction, a topic-by-topic comparative analysis of the fifteen cities, and appendices with the survey instrument). The Abstract's objective is to provide comprehensive but easily accessible information on the wide range of municipal conditions covered in the survey, as reported by households. Some information in the Abstract also comes from secondary sources, such as the national Census and the Kenya Integrated Household Budget Survey (KIHBS). The primary audience for the Abstract includes policy makers, development practitioners, development partners, civil society organizations, and urban residents. Better planning and more productive investments can result from exploiting the information in each city's Abstract.

## Methodology

For this baseline household survey, NORC used a two- and three-stage, stratified, cluster sampling design intended to be representative of poor and non-poor households living in formal and informal settlements in the fifteen cities included in the study. The first-stage sampling frame was based on Kenya's 2009 census frame of enumeration areas (EAs). In the census sample frame, EAs are identified as urban, peri-urban or rural. EAs are further identified as containing formal or informal settlement types. For the first stage sampling, NORC selected EAs from strata identified as informal (slum), urban-formal, peri-urban-formal and rural. In cases where the EAs were "large" (200 to 700 households) these EAs were divided in half, thirds, or quarters and one segment was randomly selected.

For the final stage of sampling, NORC carried out a full household listing in each selected EA (or segment, as the case may be) and randomly selected ten households for interviewing.<sup>1</sup> Because expected response rates were unknown prior to data collection, interviewers were given a target to complete at least seven interviews in each EA. In Nakuru, 136 EAs were selected in the first stage.<sup>2</sup> In the second stage, a total of 9,943 households were listed and 1,164 households were contacted for interview.

The data for this report are based on 1,095 completed interviews carried out in Nakuru from July 14, 2012 to November 12, 2012 by a team of six interviewers and one supervisor. Among eligible households,<sup>3</sup> the response rate was 94.07 percent.<sup>4</sup> Data collection took place in both formal and informal settlements simultaneously; 459 interviews were completed in informal settlements and 636 were completed in formal settlements.

## Questionnaire

The Kenya Cities Program questionnaire was developed iteratively using a base set of questions developed by the World Bank and refined to capture the key variables related to infrastructure access and municipal services of interest to the Kenyan government. The final fielded questionnaire is available in Volume II of the Overview Report. Both the household listing form and the questionnaire were programmed for use as a Computer-Assisted Personal Interview (CAPI) and both were carried out using tablet computers which transmitted data to project servers via the mobile phone network. Interviewers captured GPS coordinates during listing and again at the end of each interview.

## Data Quality

Pretesting of the questionnaire using paper-and-pencil showed an approximate administration time of 50 minutes. Recorded administration time of the CAPI instrument was considerably shorter, with a median duration of 20 minutes in Nakuru (21 minutes across all towns and cities). However, duration values may have been compromised by transmission problems and supervisor reviews, which may have overwritten timestamps. Despite the uncertainty of exact durations, data quality measures do not show systematic interviewer-related errors in the final data. Approximately a third of all interviews underwent validation, including call-backs by supervisors or central office staff (in-person and by phone).

## Table Presentation

Each city's Abstract includes a set of tables designed to provide basic information on households' economic and demographic conditions, their housing conditions, and access to infrastructure and services. One challenge in preparing the Abstract was to provide a complete picture of conditions while still being selective in the information presented so as not to overwhelm the reader. A second challenge was to display the information in a way that permits stakeholders to understand conditions faced by different population groups.

---

<sup>1</sup> A complete description of the sampling design is found in "Kenya Municipal Program State of Cities: Overview Report," NORC, June 2013.

<sup>2</sup> 134 EAs were included in the listing activity. One EA was located in police barracks, so was dropped from the study and replaced by an EA selected using the first stage criteria. Property management in a second EA declined permitting listing activity and the EA was dropped.

<sup>3</sup> Eligible households are defined as occupied dwellings with at least one resident age 18 or older who is present during the field period.

<sup>4</sup> The completion rate is the number of households that successfully completed an interview over the total number of households assigned.

To meet these challenges we have developed a set of tables with items believed to be most important for stakeholders and have broken down the items in several ways. In addition to providing an overall picture of household (HH) characteristics, the tables illustrate whether household characteristics differ by key factors. The rows of each table generally list the household characteristics (e.g., size of household, percentage of children in school). The columns present statistics for the entire city, then show how the data differs by location (informal vs. formal areas), household poverty status (poor vs. non-poor), gender of the head of household (male vs. female headed, for informal areas only), as well as other factors pertinent to the particular table.<sup>5</sup>

From each table, one can quickly observe if there are large differences in household characteristics by location, spending power, etc., simply by comparing the cells (numbers). Each table also shows whether the observed differences are statistically significant.<sup>6</sup> “Statistically significant” means that statistical analysis has revealed that a difference, no matter how small or large, is unlikely due to chance or randomness. In practice, statistically significant differences are the ones researchers are interested in—they can be interpreted as telling us about meaningful differences in household characteristics by location, spending power, gender, or other category. When we discuss differences in the text of this report, we will refer to “statistically significant” differences unless otherwise noted.

In terms of policy decisions, whether differences matter is a combination of whether they are statistically significant and how large the differences are. Ultimately, it is up to the policy practitioner to decide how large a difference must be to matter in the context of interest. An important note when interpreting results is that statistical significance does not imply causality. In other words, if values are statistically significant from each other, this does not mean that one variable caused a change in the other variable. Another factor may be influencing both variables; for example, for we may find a “significant” difference between head-of-household education and household poverty, perhaps the key common cause is social status, which affects both their educational attainment and job/spending opportunities. Additionally, where a statistically significant difference is identified it does not imply the direction of the relationship. Perhaps the household poverty is the reason for the different education levels, or vice-versa. In this report, therefore, we will say a household characteristic is “associated with” or “correlated” with certain factors, rather than saying one is caused by another.

In order not to clutter the tables yet provide the reader with the maximum information, we mark statistically significant results in the tables with **bold** (for two adjacent values in the same row) and *italics* (to compare adjacent columns of data). Underlined values denote an insufficient number of household responses for some enumeration category of the sampling design to perform a test of statistical significance. The number of observations for a particular variable is noted in the tables in rows denoted by “N”. Cells with no observations are indicated with hyphens (-).<sup>7</sup> The table, below, summarizes the formatting used in tables throughout the Abstract: A value that is both **bold** and *italicized* indicates

<sup>5</sup> Informal/formal status was defined at the enumeration area level by the Kenya National Bureau of Statistics during the 2009 Census. Poor/non-poor is defined using the answer to a question asking respondents whether their total household expenditure in the last month was above or below a poverty line calculated using the household size (5,567 KSh for each adult 15 years and older + 3,619 KSh for each child aged 5 to 14 + 1,336 KSh for each child under 5 years old).

<sup>6</sup> Statistical significance is noted when a test achieves a p-value  $\leq 0.05$ .

<sup>7</sup> Regarding issues of non-response, both observational and item-specific, see Section 4, below.

statistically significant differences for two adjacent cells (i.e., values in the same row) as well as for the distributions between adjacent columns. In contrast, a value in standard font—no bolding, italics, or underlining—still means that a significance test was performed but that the values under comparison were not statistically significantly different from each other.

There is one caveat to the formatting rules that must be addressed regarding the significance testing of distributions. While the absence of italics sometimes means that the distribution was tested and was not found to be statistically significant, this is often not the case – i.e., there are many distributions which were not tested for significance. To avoid confusion, the comprehensive list of distributions which were tested for significance follow

- **Table B.2a:** Expenditure ranges by location, tenure, water connection, business, skilled/unskilled head, and gender of household head (in informal areas)
- **Table B.2b:** Income ranges by location, tenure, water connection, business, skilled/unskilled head, and gender of household head (in informal areas)
- **Table C.3:** Distribution of home value ranges and rent ranges by location, tenure, water connection, business, skilled/unskilled head, and gender of household head (in informal areas)
- **Table D.1a:** Percent of households with a piped water connection inside their dwelling by security of ownership; percent of households with a piped water connection inside their compound by security of ownership; percent of households close to piped water access by security of ownership; cost of water by security of ownership; most important water source by security of ownership; reasons for no connection by security of ownership
- **Table D1.b:** Water source by water quality; water provider by water quality; water treatment buy water quality; treatment methods by water quality.

Another feature of the data worth mentioning is that outliers (responses that are very different from all the others) were not a major issue in the survey data, affecting just three variables in any important way.<sup>8</sup>

Finally, note that in tables presenting a distribution of responses, if some response categories are left out then the distribution will not add up to 100%. In cases where all response categories are listed then the first row of responses is given as 100. Unless otherwise noted, all figures presented in the tables are percentages.

<sup>8</sup> Across all fifteen municipalities these were (i) home value, in which 20 responses were reported in millions units instead of as the value itself (so we simply divided these responses by a million); (ii) 40 respondents reported travel time for a weekly or monthly commute rather than a daily commute (these over-eight-hours responses were dropped); (iii) we removed one case in which the time to get water was over a week.

**Table 1: Description of formats used to denote statistical significance**

Format	When we use it	Example
<b>Bold</b>	Two bolded values in the same row next to each other indicate that the difference is statistically significant. We also use bold for 'Yes' or 'No' variables. If bold, it means that the difference between the mean of households that answered 'yes' (displayed) and the mean of those that answered 'no' (not displayed) is statistically significant. <sup>(a)</sup>	Table A.1 displays the mean household size for households located in formal and informal settlements; if the pair of values is bold, it means that the difference in household sizes between formal and informal areas is statistically significant.  Table B.2 displays the proportion of households which own land (or have tenure) that fall below the poverty line. If bold, it means that this proportion is statistically significantly different from the proportion of households which do not own land that fall below the poverty line.
<i>Italics</i>	We indicate statistically significant differences between columns of three or more cells using italics; this means the difference between the entire distributions (columns) is statistically significant. <sup>(b)</sup>	Table B.2, Monthly household spending power, displays the distribution of households across income and expense ranges. If values appear italicized in both columns for households located in formal and informal settlements, the difference between the two distributions is statistically significant.
<u>Underline</u>	Denotes values where, due to lack of data at the census tract (enumeration area, or EA) level, it was not statistically possible to conduct the significance test. <sup>(c)</sup>	Table B.3 shows the mean value of households' primary residence with and without land, and of any other residence and/or land. An underlined value means that due to lack of data at the census tract level, it is not possible to perform a test for significant differences.
Hyphen (-)	In cases where there are no data for a cell at all, we note that with a hyphen (-).	Table B.3 shows data related to household finance. For the percentages of households according to source of financing, the cells that display a hyphen means that there were no observations for that particular variable and category.

*Notes:*

- Here a *p*-test from an Adjusted Wald test is conducted.
- Here Pearson's Chi-squared test is conducted.
- At least two households are required to compute a household-level variance, which is required to conduct a hypothesis test. Note that this does not imply that the respective table values are based on just one household or even just one EA.

The core of this abstract comprises a set of tables divided into chapters. Each chapter contains a textual summary of each table and highlights some of their implications. The tables are divided into four groups:

- Household characteristics – 3 tables
- Economic profile – 5 tables
- Tenure, tenure security, dwelling characteristics – 4 tables
- Infrastructure services – 7 tables

Notes to the tables are identified by small letters appearing as superscripts at the end of each table. All tables present weighted figures at the household level, unless otherwise noted, to reflect the total population of the respective table cell. The N values, however, present the unweighted number of households, unless otherwise noted.

The final chapter of this abstract contains a series of three “Development Polygons”. These complement the detailed tables presented in sections A through D by illustrating an “overall” sense of the state of the city. The figures included are the Development Diamond, the Infrastructure Polygon, and the Living Conditions Diamond.<sup>9</sup>

While the tables generally have a common set of column headings, there is some variation. The following are definitions for those headings that require clarification:

- a. *Informal/Formal Areas* – This distinguishes between areas based on whether most households in the area have property title and official services. It is a designation provided by a status code at the level of the EA (Enumeration area) as used by the National Census.
- b. *Gender (Informal)* – For the households living in the locations coded as “Informal,” data for household characteristics are provided for both male- and female-headed households. As is standard, the male-headed households may contain the spouse while female-headed households do not.
- c. *Class (of durable)* – Durable assets are a standard measure of household wealth. They are grouped into three classes, roughly based on their likely market value and degree of permanence. The actual items in each class are indicated in the table. The values reported for these categories are the number owned by the household, not their average or total value.
- d. *Spending Power* – The total value of household expenditures collected by the survey, excluding rent or mortgage payments.
- e. *Access to Infrastructure* – This indicator combines six categories of infrastructure (divided into 13 subcategories) weighted by importance to the household and summed to create a household indicator from 0 to 9.5. See NORC (August 2013), “Kenya Municipal Program State of the Cities: Overview Report” for a more detailed description.
- f. *Household Poverty* – The poverty line varies depending on the number of members of the household and their age. It is calculated by adding together:
  - 5,567 KSh per month for each adult 15 years and older in household,
  - 3,619 KSh per month for each child aged 5 to 14 in household,
  - 1,336 KSh per month for each child under 5 years old in household.

---

<sup>9</sup> The basic format for all three figures appear in the World Bank Policy Research Working Paper, “Poverty, Living Conditions, and Infrastructure Access” A Comparison of Slums in Dakar, Johannesburg, and Nairobi” by Sumila Gulyani, Debabrata Talukdar, and Darby Jack (2010). We strived to make our own figures as similar as possible, though some deviations, noted in the accompanying text, were necessary.





# HOUSEHOLD CHARACTERISTICS

This section presents basic household characteristics. Table A.1 provides information on household size and household member distribution by age category. Table A.2 details the level of education of the members of household, as well as the proportion of children and adults of different ages who were currently in school at the time of the survey. Finally, Table A.3 presents household health characteristics, including the proportion of children under 15 who have received the BCG vaccine (an immunization against tuberculosis), a major public health concern given that Kenya is a high-tuberculosis-burden country.<sup>10</sup> Table A.3 also includes the number of household members with an illness or injury in the two weeks prior to the survey, the proportion of those members who visited a health practitioner, average household medical expenditures for the month preceding the survey, and the percentage of households that have health insurance. All of these figures are given comprehensively and broken down by location type, the household's poverty status, and the gender of head of household (among informal areas).

## A.1 Household Demographic Composition

The 2009 census estimated that the municipality of Nakuru had a population of 307,990, a 33% increase over the figure reported in the 1999 census; this represents of a 2.9% annualized average growth rate.<sup>11</sup>

The average household size in Nakuru, as reported by survey respondents, is 3.1 members. The average poor household is significantly larger than the average non-poor household (3.3 vs. 2.8 members). In informal areas, male-headed households are, on average, larger than female-headed households (3.1 vs. 2.5 individuals). On average, about 88% of households' members are aged 5 to 60 years old—14.9% are between 5 and 14 years old, 71% are between 15 and 60, 11.4% are under 5 and around 2% are over 60. The head of household is female in 29% of all households. Ninety-five percent of female-headed households are located in formal areas, and 59% of female-headed households are poor, i.e. given their household size they have monthly expenditures below the poverty line. The only two significant differences found were that (1) the mean percentage of 5 to 14 year olds is significantly higher in poor households than in non-poor households, and (2) the mean percentage of individuals 15 to 60 year olds in non-poor households is higher than in poor households.

<sup>10</sup> World Health Organization Global tuberculosis report 2012, retrieved June 12th 2013 from [http://www.who.int/tb/publications/global\\_report/en/](http://www.who.int/tb/publications/global_report/en/)

<sup>11</sup> From Statistical Abstract 2010 and Statistical Abstract 2006, Kenya National Bureau of Statistics.

**Table A.1: Household demographic characteristics**

Characteristic	All	Location		Husehold poverty poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Number of households							
Weighted	88,041	4,597	83,444	53,552	32,449	3,223	1,253
N (unweighted)	1,095	459	636	693	386	323	124
Size of household	3.11	2.97	3.11	<b>3.29</b>	<b>2.84</b>	<b>3.11</b>	<b>2.51</b>
N	1,095	459	636	693	386	323	124
Mean percent of household members aged:							
Total	100	100	100	100	100	100	100
Under 5	11.4	12.5	11.3	<b>13.2</b>	<b>9.1</b>	11.0	14.8
5 to 14	14.9	13.5	14.9	16.1	13.1	13.0	14.8
15 to 60	71.0	72.2	71.0	<b>68.6</b>	<b>74.3</b>	74.0	68.9
Over 60	2.0	1.3	2.0	1.7	2.3	1.3	1.5
N	1,095	459	636	693	386	323	124
Proportion of households...							
Male-headed	71	72	71	72	69		
Female-headed	29	28	29	28	31		
N	1,064	447	617	667	381		
Female-headed distribution		5	95	59	41		
N		301	298				

## A.2 Household Education Characteristics

Nakuru was part of the Rift Valley Province, where in 2009 primary classrooms had an average class size of 36 students and secondary classrooms had on average 34 students. Student-teacher ratios in the former Rift Valley Province were, on average, 40.5 for primary schools and 23 for secondary schools.<sup>12</sup>

The first panel of Table A.2 presents statistics on the education of all individuals aged 5 years and older within the surveyed households. About 36% of all individuals have completed secondary school or higher—a figure that is likely skewed by the fact that the majority of household members are between 15 and 60 years old—and 50% completed primary or higher. On the one hand, a significantly higher percentage of household members in informal areas completed primary school than did so in formal areas; on the other hand, significantly more household members in formal areas completed more than a secondary education (15% vs. 9% for informal areas). A similar pattern is registered by poverty level; while a larger proportion of poor households only completed primary school than non-poor households (18% vs. 11%), individuals from non-poor households were more likely to complete more than secondary school than those from poor households (23% vs. 10%). Having “no education” is rare; only 2% of individuals in poor households had no education and there are no differences across categories. In informal areas, members in male-headed households are more likely to have ended their education after completing secondary school than female-headed households (25% vs. 16%); although, members in female-headed households are more likely to have completed more than secondary school than members from male-headed households (13% vs. 8%).

<sup>12</sup> Provinces no longer exist in Kenya. This data is based on the Kenyan Institute for Public Policy Research and Analysis 2009 Economic Report, Table A3.16, pg. 192, per Ministry of Education statistics, [http://www.marsgroupkenya.org/pdfs/2009/10/Kenya\\_Economic\\_Report\\_2009.pdf](http://www.marsgroupkenya.org/pdfs/2009/10/Kenya_Economic_Report_2009.pdf)

The second panel of the table shows the mean percent of adult individuals over 18 years within each household. This is done to show intra-household educational levels among households' adult members. We find that on average, 49.4% of a Nakuru household's adults have completed secondary school or higher (28.9% completed secondary, while 20.5% completed higher education). Only about 2.5% of a household's adults had no education whatsoever. The remaining 47.1% completed some primary, all of primary, or some secondary schooling. We also found interesting differences between households in formal and informal areas. In informal areas, a significantly higher percentage of household's adults completed primary school, while a significantly lower percentage completed higher education past secondary. In poor areas, a significantly higher percent of households' adults only completed primary school, while a significant lower percentage completed higher education past secondary. Finally, we found that in informal areas, a significantly higher percentage of female-headed households' adults completed higher education past secondary (21.9% vs. 12% of adults from male-headed households).

Ninety-three percent of individuals aged 5 to 14 years old are currently in school; this figure is 67.3% for individuals 15 to 18 and 10.3% for individuals over 18. The percentage of individuals over 18 that are currently in school is significantly higher among non-poor households than poor households (14.3% vs. 8.3%), while in informal areas, the percentage of adults in school is considerably higher among female-headed households than among male-headed ones (16.4% vs. 7.9%).

**Table A.2: Household education characteristics**

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of individuals 5 and older with highest grade completed:							
Total	100	100	100	100	100	100	100
None	2	2	2	2	2	2	2
Some Primary	33	32	33	35	31	31	37
Completed primary	16	19	16	18	11	20	18
Some secondary	13	14	13	13	13	14	14
Completed secondary	21	23	21	21	21	25	16
Higher	15	9	15	10	23	8	13
N	2,758	1,123	1,635	1,837	877	830	260
Mean percent of household's adults over 18 with highest grade completed:							
Total	100	100	100	100	100	100	100
None	2.5	2.1	2.6	1.7	2.7	1.9	2.2
Some Primary	14.0	13.0	14.1	14.6	13.1	11.6	15.2
Completed primary	18.4	23.7	18.1	21.8	12.3	24.7	22.2
Some secondary	14.7	16.6	14.6	15.5	13.7	17.4	13.9
Completed secondary	28.9	29.2	28.9	30.1	27.5	31.4	23.5
Higher	20.5	14.5	20.9	15.3	30.4	12.0	21.9
N	1,094	459	635	693	385	323	124
Percent of individuals in school by age group:							
5 to 14	93.2	88.3	93.5	92.4	94.6	89.4	91.3
N	413	171	242	289	119	122	45
15 to 18	67.3	65.1	67.4	58.5	80.8	65.3	67.9

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
N	162	67	95	102	58	44	20
Over 18	10.3	10.0	10.3	<b>8.3</b>	<b>14.3</b>	<b>7.9</b>	<b>16.4</b>
N	1,091	458	633	691	384	323	123

### A.3 Household Health Profile

Nakuru was part of Rift Valley Province, which in 2005 had an average of 11 doctors and clinical officers per 100,000 residents and 51 nurses per 100,000 residents.<sup>13</sup> The former Rift Valley Province had 16 medical facilities per 100,000 residents, including hospitals, clinics, dispensaries, and other types of facilities.<sup>14</sup>

Overall, 88% of households' children under 15 have received BCG (tuberculosis) immunizations, with not enough observations within EAs to test for statistical significance of variation between groups. Fifteen percent of households had a sick or injured household member in the two weeks prior to the interview. Sixty-nine percent of these visited a health practitioner, spending on average 565 KSh on medical expenses. Rates of health insurance coverage are quite low (10%).

**Table A.3: Household health characteristics**

Characteristic	All	Location		HH poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of household's children under 15 having received BCG immunization	88	87	89	88	89	87	89
N	633	269	364	445	183	182	77
Percent of households with an injured/ill member, previous two weeks	15	11	15	15	13	11	12
N	1,095	459	636	693	386	323	124
Percent of ill household members that visit a health practitioner, previous two weeks	69	76	69	66	81	84	60
N	139	50	89	90	45	36	14
Household medical expenditures (KSh), previous month	565	572	565	471	737	324	1232
N	1,092	459	633	691	385	323	124
Percent of households with health insurance	10	9	10	9	12	9	6
N	1,091	459	632	691	386	323	124

<sup>13</sup> 2004/2005 numbers of healthcare providers obtained from Partners for Health Reformplus 2006 Report, Table A1, pg. 39, Annex A, statistics obtained from Rep. of Kenya. [www.healthsystems2020.org/files/1654\\_file\\_Tech101\\_fin.pdf](http://www.healthsystems2020.org/files/1654_file_Tech101_fin.pdf). Per capita figures calculated by dividing by 2005 (estimated) population obtained from the Kenya Integrated Household Budget Survey, Table 3.1, [http://www.knbs.or.ke/pdf/Basic%20Report%20\(Revised%20Edition\).pdf](http://www.knbs.or.ke/pdf/Basic%20Report%20(Revised%20Edition).pdf).

<sup>14</sup> Based on most current (undated) figures from Kenya Bureau of Statistics Open Kenya online database, <https://kenya.socrata.com/Health-Sector/Health-Facility-Pie-Chart/yr4-763w>. Per capita figures calculated by dividing by 2009 census population, obtained from 2010 Statistical Abstract, Kenya National Bureau of Statistics.

## HOUSEHOLD ECONOMIC PROFILE

### B.1 Household Occupational Composition

Table B.1 presents the current occupation, or main activity, of household members. The first panel shows the percent of all adults over 18 in each of the occupations. The five most prominent occupation categories are casual employee, regular employee, self-employed, homemaker, and student, which together comprise about 81% of all adults in Nakuru over 18 years old. About 7% of adults are unemployed and looking for a job, and 5.6% are unemployed and not looking for one. Individuals in informal areas are significantly more likely to be casual employees than individuals in formal areas (34.4% vs. 23.4%), and are significantly less likely to be unemployed and not looking for a job (3.3% vs. 5.8% in formal areas). Individuals in poor households are significantly less likely to be regular employees, students, and earning income from investments or property, while they are significantly more likely to be casually employed, homemakers and even sick or unable to work than individuals from non-poor households. Although members of female-headed households are three times as likely to be students as members of male-headed households (16.7% vs. 5.5%), the proportion of sick members or individuals unable to work among female-headed households is higher than among individuals from male-headed households in informal areas (1% vs. 0.1%).

The second panel shows the average percent of adults over 18 within each household that are occupied in each of the categories. This is done to show intra-household occupational status among households' adult members. The results here are similar to those in the first panel above. Here, we find that on average, about two-thirds (64.7%) of a household's adult members are either regular employees, casual employees, or self-employed. About 11.6% are homemakers, 5.8% are unemployed but looking for work, and 7% are students; no other category includes more than 5% of adult household members. Interestingly, our survey found that in formal areas, the average percent of households' adults who are regular homemakers is slightly higher than the average percent in informal areas (11.6% vs. 10.9%, a significant difference). Regarding poverty level, while adults in the average poor household are more likely to be casual employees and homemakers, the percentages of regular employees, self-employed adults, apprentices, and students are significantly higher in the average non-poor household. In informal areas, male-headed households tend to be composed, on average, by a larger proportion of casual employees and homemakers than female-headed households. In contrast, female-headed households are more likely, on average, to host a larger proportion of regular employees and students than male-headed households.

**Table B.1: Household members' main activity**

Occupation <sup>a</sup>	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of adults over 18 with occupation:							
Employer	0.1	0.1	0.1	0.1	0.0	0.1	0.0
Regular employee	21.1	18.2	21.3	17.3	26.5	18.7	17.4
Casual employee	24.0	34.4	23.4	28.9	16.4	36.1	27.5
Self-employed	14.3	11.3	14.5	12.9	17.0	10.9	14.5
Unpaid family worker	0.4	0.1	0.4	0.3	0.5	0.1	0.0
Apprentice	0.4	0.0	0.4	0.1	1.0	0.0	0.0
Student	9.2	8.0	9.3	6.5	13.7	5.5	16.7
Pensioner/investor	0.7	0.4	0.8	0.6	1.0	0.5	0.0
Earning from investments/ property	1.0	0.6	1.0	0.7	1.7	0.4	0.6
Sick/unable to work	0.6	0.3	0.6	0.9	0.0	0.1	1.0
Unemployed looking for work	7.1	8.1	7.1	8.6	4.8	7.3	10.4
Unemployed, not looking for work now	5.6	3.3	5.8	5.6	4.7	3.7	2.4
Homemaker	12.2	12.2	12.2	13.9	9.8	12.9	8.6
N	1,956	808	1,148	1,274	649	612	173
Mean percent of household's adults over 18 with occupation: <sup>b</sup>							
Employer	0.1	0.2	0.0	0.1	0.0	0.3	0.0
Regular employee	21.9	19.1	22.0	18.0	26.8	18.9	20.7
Casual employee	27.7	36.3	27.3	33.1	20.0	39.2	28.1
Self-employed	15.1	12.3	15.2	12.2	19.7	11.3	16.2
Unpaid family worker	0.2	0.1	0.2	0.1	0.1	0.1	0.0
Apprentice	0.4	0.0	0.4	0.1	0.9	0.0	0.0
Student	7.6	7.1	7.6	6.1	10.0	4.5	13.7
Pensioner/investor	0.7	0.3	0.7	0.5	1.1	0.5	0.0
Earning from investments/ property	1.0	0.4	1.0	0.7	1.5	0.3	0.3
Sick/unable to work	0.4	0.2	0.4	0.7	0.0	0.1	0.5
Unemployed looking for work	5.8	7.5	5.7	7.1	3.8	6.5	9.5
Unemployed, not looking for work now	4.6	2.8	4.7	4.3	4.4	3.5	1.2
Homemaker	11.6	10.9	11.6	13.8	8.4	11.6	7.8
N	1,094	459	635	693	385	323	124

Notes:

- The category "Other" has been omitted.
- These numbers are obtained by first computing the percentages of each household's members in each category, and then taking the mean of these percentages over all households.

## B.2 Household Income/Expenditure Levels

There are two general approaches to measure spending power: expenditure and income, both of which are shown in the tables below. In the survey, income derives from household members' salaries, business earnings, rents, public cash support, and earnings from financial assets in the month prior to the interview, but does not include any remittances. Expenditures include all purchases, including investments for household-owned businesses. In theory, both approaches express the same amount of spending power, but typically one approach is not enough, especially when estimations are based on survey data. This is because survey respondents' perceptions about their income and expenditures can be unreliable; estimates vary depending on seasonal changes in economic activities, type of assets owned, household's cash flows, and in-kind payments.

In practice, the expenditure approach is usually more accurate because most respondents, making purchases daily, recall their expenses better. Income, on the one hand, can be problematic because it can be subject to respondent misreporting (e.g., desire to impress the enumerator) and, with non-wage income; respondents do not generally make a clear distinction between revenue (sales) and income (revenue minus expenses). Using both methods, therefore, provides an additional level of verification.

Over half (62%) of all households have monthly expenditures below the poverty line, as determined by the household composition. This proportion is about equally high in both formal and informal areas; however, households whose heads work in a "skilled" profession are more less likely to be below the poverty line than households headed by individuals working in an "unskilled" profession (55% vs. 65%). In informal areas, considerably more male-headed households remain below the poverty line than female-headed ones (72% vs. 55%), a statistic that is skewed though by the fact that there are considerably more male-headed households in Nakuru. Poverty status does not vary significantly depending on whether households own a business.

Income and expenditure distributions vary significantly depending on household location (only income), tenure status, water connection, and whether the household head is skilled. Whether a household owns its dwelling, has a water connection or is headed by a "skilled" individual are strong predictors of income and expenditure levels—these households are more likely to fall into the highest income/expenditure categories and significantly less likely to be below the poverty line (except tenure).

On average, households who sent money to individuals outside their household sent around 5,959 KSh in the three months prior to the interview, and those that received money received, on average, almost 8,652 KSh in the same period. Households were more likely to send money than to receive it, and wealthier households were much more likely to send money—45% of households in the top expenditure category sent money to friends or relatives, compared to only 13% of those in the bottom—and receive money—38% of households in the top expenditure category received money from friends or relatives, compared to only 16% of those in the bottom.

**Table B.2a: Monthly household spending power, as measured by expenditure**

Characteristic	All	Location		Household has...			Household head is <sup>c</sup>		Gender (Informal)		Value of transfer (row pct.) <sup>d</sup>
		Informal areas	Formal areas	Tenure <sup>a</sup>	Water connection	A business <sup>b</sup>	Skilled	Un-skilled	Male-headed	Female-headed	
Percent of households below poverty line	62	67	62	60	<b>50</b>	58	<b>55</b>	<b>65</b>	<b>72</b>	<b>55</b>	
N	1,079	456	623	97	141	163	288	791	320	124	
Mean expenditure (monthly KSh)	16,020	<b>12,317</b>	<b>16,224</b>	<b>26,000</b>	<b>27,240</b>	17,779	<b>20,107</b>	<b>14,423</b>	12,658	11,399	
N	1,095	459	636	99	141	169	293	802	323	124	
Percent of households with expenditure: <sup>d</sup>											
Less than 3,000 KSh	2	1	2	2	0	2	1	2	1	1	3,760 (13%)
3,001-6,000 KSh	13	15	12	11	6	9	<b>8</b>	<b>14</b>	16	14	2,876 (18%)
6,001-9,000 KSh	16	<b>24</b>	<b>16</b>	10	10	<b>9</b>	13	17	23	28	3,593 (24%)
9,001-30,000 KSh	24	26	24	<b>12</b>	<b>14</b>	28	19	26	24	29	3,679 (28%)
13,001-18,000 KSh	20	17	20	19	13	20	24	19	20	13	4,818 (44%)
18,001-30,000 KSh	17	13	18	25	35	21	<b>22</b>	<b>15</b>	12	13	4,931 (47%)
31,001-75,000 KSh	6	4	6	<b>13</b>	<b>18</b>	10	<b>11</b>	<b>4</b>	4	2	10,795 (48%)
Above 75,000 KSh	2	0	2	<b>8</b>	<b>4</b>	1	2	1	0	0	10,507 (45%)
N	1,095	459	636	99	141	169	293	802	323	124	361
Cash transfers <sup>e</sup>	5,959	<u>3,486</u>	<u>6,044</u>	<u>3,823</u>	<u>8,613</u>	<u>10,566</u>	<u>5,630</u>	<u>6,204</u>	<u>3,375</u>	<u>3,570</u>	
N	186	69	117	24	28	34	47	139	35	31	

**Notes:**

- Household possesses deed or other officially recognized document conferring ownership of the structure, land, or both.
- "Business" refers to a self-employed activity that may or may not entail household or wage employees.
- Includes those self-declared as "skilled" as well as "professional".
- An imputed 30-day value from responses over several periods (7 days for food, 30 days for other consumables, 12 months for durables and annual services). See Volume I in the Overview Report. No significance test performed on this column.
- Transfers are cash outflows over last three months averaged over households with such flows (equal to proportion of row households in parentheses).



**Table B.2b: Monthly household spending power, as measured by income**

Characteristic	All	Location		Household has...			Household head is <sup>c</sup>		Gender (Informal)		Value of remittance (row pct.) <sup>e</sup>
		Informal areas	Formal areas	Tenure <sup>a</sup>	Water connection	A business <sup>b</sup>	Skilled	Un-skilled	Male-headed	Female-headed	
Proportion of households with income: <sup>d</sup>											
Less than 3,000 KSh	6	10	6	6	4	2	2	8	8	17	5,041 (16%)
3,001-6,000 KSh	16	22	16	10	3	10	9	19	21	23	3,490 (16%)
6,001-9,000 KSh	18	22	18	13	7	20	11	21	23	19	5,831 (13%)
9,001-30,000 KSh	19	17	19	12	5	13	24	17	18	16	8,776 (21%)
13,001-18,000 KSh	14	11	15	16	22	16	20	12	12	11	5,702 (20%)
18,001-30,000 KSh	15	12	15	12	23	22	17	14	12	11	1 0 , 6 7 3 (26%)
31,001-75,000 KSh	9	5	9	20	29	13	13	7	6	4	2 5 , 3 6 3 (18%)
Above 75,000 KSh	2	0	2	10	7	2	3	2	0	0	6,509 (38%)
N	1,030	439	591	92	135	151	273	757	306	122	173
Cash remittances <sup>e</sup>	8,652	10,950	8,552	7,530	19,887	8,088	9,118	8,479	12,566	9,759	
N	186	69	117	24	28	34	47	139	35	31	

**Notes:**

- Household possesses deed or other officially recognized document conferring ownership of the structure, land, or both.
- "Business" refers to a self-employed activity that may or may not entail household or wage employees.
- Includes those self-declared as "skilled" as well as "professional".
- Total household cash income in KSh, previous month, not including in-kind income or cash assistance from/to family or friends who live outside the household. No significance test performed on this column.
- Remittances are cash inflows over last three months averaged over households with such flows (equal to proportion of row households in parentheses).

## B.3 Household Wealth Composition

The “household wealth index” is calculated from the household’s declared ownership of a list of common household items. The value itself is created by totaling the estimated value of each item (indicated in brackets, in USD), converting to KSh, and dividing by 1,000; so the average of 27.6 means that the average household owned approximately 27,600 KSh worth of listed possessions. However, since each possible possession was only counted once, this should not be taken as a reliable estimate, but rather a unitless index of comparison. Households in informal areas, poor households and female-headed households hold lower scores of the index than households in formal settlements, non-poor and male-headed households. All differences between categories are statistically significant.

**Table B.3: Household wealth composition**

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Index of household wealth <sup>a</sup>	27.6	21.9	28.0	24.0	33.6	23.3	18.1
N	1,095	459	636	693	386	323	124
Household’s average holdings of:							
Class-1 durables (furniture, pans, iron, mosquito net) [7]	5.3	<b>5.0</b>	<b>5.4</b>	<b>5.2</b>	<b>5.6</b>	5.1	4.7
Class-2 durables (stove, sewing machine, fan, wheelbarrow, water storage tank) [60]	1.0	<b>0.9</b>	<b>1.1</b>	1.0	1.1	1.0	0.8
Class-3 durables (refrigerator, washing machine, electric generator, bicycle) [100]	0.2	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.3</b>	<b>0.2</b>	<b>0.1</b>
Farm animals (poultry and livestock) [200]	0.1	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.2</b>	0.1	0.0
Entertainment equipment (radio, TV, satellite dish, DVD, video player) [80]	1.8	1.6	1.8	<b>1.6</b>	<b>2</b>	<b>1.7</b>	<b>1.4</b>
Motorized transport (motorcycle [400], car [1,000])	0.0	0.0	0.0	0.0	0.1	0.0	0.0
N	1,095	459	636	693	386	323	124
Value of primary residence, not its land (in 1,000 KSh) <sup>b</sup>	100	<u>100</u>	<u>100</u>	<u>100</u>	-	-	-
N	2	1	1	2	0	0	0
Value of primary residence and its land (in 1,000 KSh) <sup>b</sup>	5,438	<u>1,281</u>	<u>5,604</u>	<u>2,993</u>	<u>7,684</u>	<u>1,632</u>	<u>372</u>
N	58	20	38	29	29	15	5
Value of other land and/or residence (in 1,000 KSh) <sup>c</sup>	2,133	<u>1546</u>	<u>2142</u>	<u>984</u>	<u>3243</u>	<u>1546</u>	-
N	23	4	19	12	11	4	0

**Notes:**

- This is a class-weighted average of the number of items as disaggregated in this same table, multiplied by the weight given within the square brackets [ ].
- About 95% of the sample had missing values for this amount, though at about the same frequency across the categories of this table. About half the sample that declared owning land or a residence failed to report its value. Averages are only over households with the asset. See “Proportion of Owners” in Table C.1. Note that values in the last three rows of the table are divided by one thousand.
- Since the survey does not ask the value of these, they have been imputed as a percent of primary residence value where it was declared (see Footnote (b)). These imputations are: land in city (10%), land outside city (5%), residence only in city (40%), and residence only outside of city (28%). If household has both land and structure these are scored separately and added together. In the case where the land of primary residence is not owned the value of the residence is first doubled before the imputations are made.

There are significant but small differences by area type and poverty in holdings of Class-1 durables, area type and gender of head in Class-2 durables, and area type, poverty, and gender of head in Class-3 durables. Non-poor households hold on average, two entertainment equipment items compared to 1.6 among poor households. Also, male-headed households own, on average 1.7 entertainment equipment items and female-headed households own 1.4 items.

Home values are relatively concentrated. The high number of missing or don't know responses to this question means that the averages shown are drawn from a relatively small group and tests of statistical significance were not possible.

## B.4 Household Finance

Around 52% of all households in Nakuru have a bank account, a number that differs significantly across area type, and poor/non-poor status. Although the percentage of households with loans is extremely low, there are significant differences across area type and poverty status in the proportion of households that obtained loans from banks (5% of households) and microfinance institutions (2% of households). Households in formal areas and non-poor households are significantly more likely to obtain loans from banks and microfinance institutions than households in informal settlements and poor households (though percentages here are still very small). Consistent with findings mentioned above, far more households (38%) sent money to people not living at the household than received money (20%). Households in formal areas are more likely to send and receive money than those in informal settlements. Significantly fewer poor households send money than non-poor households. In informal areas, significantly more female-headed households than male-headed households receive assistance.

**Table B.4: Household finance**

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of households with a bank account	52	<b>42</b>	<b>53</b>	<b>49</b>	<b>59</b>	45	35
N	1,090	458	632	688	386	322	124
Percent of households with a loan	11	<b>5</b>	<b>11</b>	<b>8</b>	<b>18</b>	6	5
N	1,095	459	636	693	386	323	124
Percent of households with a loan from a...							
Bank	5	<b>2</b>	<b>5</b>	<b>3</b>	<b>9</b>	2	1
Microfinance institution	2	<b>1</b>	<b>2</b>	<b>1</b>	<b>4</b>	0	1
Savings/credit group or co-op	5	2	5	3	8	3	1
Relative/friend	1	2	1	1	2	2	2
Informal lender	0	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
N	1,095	459	636	693	386	323	124
Percent of households receiving cash from those not now living at residence <sup>a</sup>	20	<b>15</b>	<b>20</b>	20	21	<b>11</b>	<b>25</b>
N	1,095	459	636	693	386	323	124
Percent of households sending cash to those not now living at residence <sup>a</sup>	38	<b>28</b>	<b>39</b>	<b>35</b>	<b>44</b>	31	23
N	1,095	459	636	693	386	323	124

Notes:

Over the previous twelve months.

## B.5 Household-Owned Business Profile

Seventeen percent of households own a business, most of which (59%) engage in some form of selling. The rate business ownership between households in formal and informal settlements is the only significant difference on this table. These businesses tend to be fairly new, as the average age for a business is less than a year and the average number of employees is between one and two—in fact, the business owner is the sole employee in many cases. Nearly all businesses are registered either with a local authority (56%) or not at all (41%), and 46% of businesses do not pay fees or taxes. However, the relatively low number of businesses means that it is not possible to perform tests of statistical significance for most of Table B.5.

**Table B.5: Household-owned business profile**

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of household with business ownership, last 12 months	17	11	17	15	18	12	11
N	1,095	459	636	693	386	323	124
Type of business: <sup>a</sup>							
Manufacturing	12	13	12	14	8	16	3
Selling	59	62	58	64	55	55	82
Transport	7	3	8	4	8	4	0
Professional (including Internet)	0	0	0	0	0	0	0
Other (barber, cleaning, etc.)	22	24	22	18	29	29	8
N	169	52	117	95	68	38	14
Years in operation	0.9	1.2	0.9	0.5	1.1	1.3	1.1
N	169	52	117	95	68	38	14
Number of employees	1.7	1.5	1.7	1.6	1.7	1.5	1.4
N	168	52	116	95	68	38	14
Which are...							
Household members	1.1	1.1	1.1	1.2	1	1.1	1
N	168	52	116	95	68	38	14
Non-household members	0.6	0.4	0.6	0.4	0.8	0.4	0.4
N	165	52	113	93	68	38	14
Revenue in previous month <sup>b</sup>	14,818	11,569	14,945	10,522	20,213	10,708	13,858
N	131	43	88	69	56	31	12
Registration status:							
Local authority (municipal or city council)	56	60	56	56	60	67	40
Kenya Revenue Authority	2	4	2	3	1	5	0
Registrar of Companies	2	0	2	1	3	0	0
None of the above	41	36	41	41	38	28	60
N	169	52	117	95	68	38	14
Share of businesses making fiscal contributions:							
Daily market local fee	18	17	18	20	17	16	18
Single business permit local fee	34	35	34	34	35	43	13
Value Added Tax	2	6	2	2	3	5	9
N	169	52	117	95	68	38	14

Notes:

- Households were allowed to choose more than one category so these figures may exceed 100%.
- Average over only those businesses operating over the period.

## DWELLING TENURE, SECURITY, AND CHARACTERISTICS

### C.1 Household Dwelling Characteristics

On average, households in Nakuru have 2.2 people per room, a ratio that significantly differs by poor/non-poor status and the gender of household head. Households have more than one bathroom on average. Twenty-one percent of households have a kitchen. This proportion is more than twice as high in formal settlements (22%) as in informal (10%), and higher among non-poor households (27%) than poor households (18%). Both are significant differences.

Most households in Nakuru cook with charcoal, gas or paraffin/kerosene. Significantly higher percentages of households in formal areas use gas. A significantly higher proportion of poor households charcoal, but they are less likely to cook with electricity and gas than do non-poor households; on the other hand, significantly larger proportions of non-poor households use electricity and gas.

Most households are renters (88%), with only a small percentage (11%) owning their land and structure. There are no significant differences in property ownership patterns across categories.

Households in Nakuru report that they are highly susceptible to natural and manmade hazards. Fully 53% of households report that the area around their dwelling floods during heavy rains, 17% live in areas subject to mudslides, 20% say they live within a ten-minute walk of a formal or informal garbage dump, and 7% state that they are exposed to factory pollution in their neighborhood. Households in informal areas and those that are poor are more likely to be closer to formal or informal garbage dumps than households in formal areas and non-poor ones. Likewise, in formal areas and among non-poor households respondents reported less incidence of factory pollution than respondents located in informal settlements and those who belong to poor households.

Quality of housing (wall materials) varies widely across location and poverty status. Nine percent of households in this city have an earth or clay floor, and almost all households (92%) have an iron or grass roof. Only 61% of households have stone or brick walls; although the latter is more common in formal areas than informal areas (62% vs. 36%), and among non-poor households than poor households (69% vs. 57%).

**Table C.1: Household dwelling characteristics**

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Number of persons per room	2.2	2.3	2.2	<b>2.4</b>	<b>1.8</b>	<b>2.4</b>	<b>2.1</b>
N	1,082	454	628	686	380	319	123
Number of bathrooms	1.3	1.5	1.3	1.2	1.4	1.4	1.7
N	1,094	459	635	693	386	323	124
Proportion of residences with kitchen	21	<b>10</b>	<b>22</b>	<b>18</b>	<b>27</b>	12	8
N	1,095	459	636	693	386	323	124
Primary cooking fuel:							
Electricity	3	3	3	<b>2</b>	<b>4</b>	2	5
Paraffin or kerosene	12	13	12	12	14	15	9
Gas	12	7	<b>12</b>	<b>8</b>	<b>20</b>	6	9
Charcoal	69	74	69	<b>74</b>	<b>60</b>	73	76
Firewood	3	3	3	4	3	3	2
N	1,073	447	626	683	374	311	124
Proportion of households that:							
Total	100	100	100	100	100	100	100
Owens the land only	0	0	0	0	0	<u>0</u>	<u>0</u>
Owens structure only	0	0	0	0	0	<u>0</u>	<u>0</u>
Owens land and structure	11	7	11	11	11	<u>8</u>	<u>7</u>
Rents	88	92	88	88	88	92	93
Squats	0	0	0	1	0	0	0
N	1,095	459	636	693	386	323	124
Pct. of households in areas subject to <sup>a</sup> :							
Flooding <sup>b</sup>	53	55	52	55	49	54	58
Mudslides <sup>c</sup>	17	21	17	19	14	20	23
10 minute walk to formal or informal garbage dump	20	<b>39</b>	<b>19</b>	<b>23</b>	<b>15</b>	38	41
Factory pollution (air, water, noise)	7	<b>11</b>	<b>7</b>	<b>8</b>	<b>4</b>	12	11
N	1,095	459	636	693	386	323	124
Housing quality:							
Pct. with earth/clay floor	9	<b>26</b>	<b>8</b>	<b>10</b>	<b>6</b>	27	23
Percent with corrugated iron roof	92	96	92	93	90	97	96
Percent with grass roof	0	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Percent with stone/brick/block walls	61	<b>36</b>	<b>62</b>	<b>57</b>	<b>69</b>	35	38
N	1,095	459	636	693	386	323	124

**Notes:**

- All data is self-reported, and therefore subjective.
- Households reported that the area floods during heavy rains.
- Households reported that they are located on a hillside that is subject to mudslides.

## C.2 Home and Land Ownership

Most households are renters (88%), with only a small percentage (11%) owning their land and structure. Seventy-four percent of households owning their structure reported feeling secure in their ownership.

**Table C.2: Household residence and land tenure**

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of households that:							
Total	100	100	100	100	100	100	100
Own the land only	0	0	0	0	0	<u>0</u>	<u>0</u>
Own structure only	0	0	0	0	0	<u>0</u>	<u>0</u>
Own land and structure	11	7	11	11	11	8	7
Rent	88	92	88	88	88	92	93
Squat	0	0	0	1	0	0	0
N	1,095	459	636	693	386	323	124
Percent of households that feel secure in ownership	74	<u>53</u>	<u>75</u>	<u>68</u>	<u>80</u>	<u>64</u>	<u>21</u>
N	99	31	68	60	37	23	8
Variability of households feeling secure <sup>a</sup>	0.004	0.27	0.01	0.05	0.6	0.29	0.17
N	99	31	68	60	37	23	8
Percent of house holds that experienced eviction	3	3	3	2	5	3	3
N	1,095	459	636	693	386	323	124
Proportion of household owners by type of land-possession document:							
Total	100	100	100	100	100	100	100
None	11	<u>14</u>	<u>11</u>	<u>14</u>	<u>7</u>	<u>9</u>	<u>30</u>
Freehold title	59	<u>47</u>	<u>59</u>	<u>55</u>	<u>65</u>	<u>46</u>	<u>49</u>
Temporary occupation license	2	<u>6</u>	<u>2</u>	<u>3</u>	<u>0</u>	<u>8</u>	<u>0</u>
Share certificate	9	<u>1</u>	<u>10</u>	<u>13</u>	<u>0</u>	<u>2</u>	<u>0</u>
Government certificate of title <sup>b</sup>	16	<u>30</u>	<u>16</u>	<u>13</u>	<u>24</u>	<u>32</u>	<u>22</u>
Letter from chief (provincial administration)	0	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Other	3	<u>3</u>	<u>3</u>	<u>2</u>	<u>4</u>	<u>4</u>	<u>0</u>
N	113	34	79	70	41	26	8
Neighborhood mobility							
Years in dwelling	5.5	5.2	5.5	5.5	5.5	5.5	5.2
N	1,094	459	635	693	385	647	323
Years in neighborhood	6.4	6.5	6.4	6.4	6.4	6.4	6.5
N	1,092	459	633	691	385	323	124
Home loan payment as a percent of spending power <sup>c</sup>	92	<u>36</u>	<u>93</u>	<u>43</u>	<u>114</u>	<u>36</u>	<u>0</u>
N	22	6	16	10	12	6	0

Notes:

- Computed as the intra-class correlation coefficient, where the "class" is the EA. This measures the extent to which households within an EA resemble each other in their feelings of security in ownership. No significance tests performed on this row.
- Long-term lease from City council/Government.
- Computed only for those with a housing loan.

Most household owners (59%) reported having a freehold title for their land, while 16% declared having a government certificate of title, and 11% reported no land possession documents whatsoever. Three percent of households reported being evicted.

The bottom portion of Table C.2 focuses on neighborhood mobility. Households reported living an average of five and a half years in their present dwelling, and about a year longer in their present neighborhood.

### C.3 Distribution of Housing Values and Rents

Most respondents reported their home values to be between 9,000 KSh and 2.5 million KSh, but still 40% of them reported home values beyond 2.5 million KSh; the average value was about 5.28 million. Note that very few households—60 in total—reported home values, so these results are likely unreliable.

Average rent is 2,135 KSh per month and renters are quite evenly distributed across ranges of rent amount, while only 13% of them pays more than 3,500 KSh. Differences across categories could not be tested for significance.

**Table C.3: Distribution of housing values and rents**

Characteristic	All	Location		Household has...			Household head is... <sup>c</sup>		Gender (Informal)	
		Informal areas	Formal areas	Tenure	Water connection	A business	Skilled	Un-skilled	Male-headed	Female-headed
Average home value (1,000 KSh) <sup>a</sup>	5,276	<u>1,214</u>	<u>5,443</u>	<u>5,438</u>	<u>17,453</u>	<u>1,177</u>	<u>17,846</u>	<u>2,292</u>	<u>1,632</u>	<u>372</u>
N	60	21	39	58	15	13	13	47	15	5
Distribution of home values: Total	100	100	100	100	100	100	100	100	100	100
1-8,999 KSh	0	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
9,000-299,999 KSh	11	<u>40</u>	<u>10</u>	<u>9</u>	<u>8</u>	<u>12</u>	<u>24</u>	<u>8</u>	<u>25</u>	<u>66</u>
300,000-999,999 KSh	33	<u>16</u>	<u>34</u>	<u>34</u>	<u>12</u>	<u>57</u>	<u>0</u>	<u>41</u>	<u>17s</u>	<u>17</u>
1,000,000-2,499,999 KSh	16	<u>30</u>	<u>15</u>	<u>16</u>	<u>18</u>	<u>6</u>	<u>17</u>	<u>15</u>	<u>37</u>	<u>17</u>
2,500,000-250,000,000 KSh	40	<u>14</u>	<u>41</u>	<u>41</u>	<u>62</u>	<u>25</u>	<u>59</u>	<u>36</u>	<u>21</u>	<u>0</u>
N	60	21	39	58	15	13	13	47	15	5
Average monthly rent (tenants) <sup>b</sup>	2,135	<u>1,639</u>	<u>2,164</u>		<u>5,575</u>	<u>2,166</u>	<u>2,879</u>	<u>1,813</u>	<u>1,616</u>	<u>1,682</u>
N	977	424	553		118	147	273	704	297	116
Distribution of monthly rents: Total	100	100	100		100	100	100	100	100	100
1-899 KSh	25	<u>20</u>	<u>26</u>		<u>10</u>	<u>22</u>	<u>11</u>	<u>31</u>	<u>20</u>	<u>21</u>
900-1,499 KSh	21	<u>30</u>	<u>20</u>		<u>10</u>	<u>22</u>	<u>21</u>	<u>20</u>	<u>32</u>	<u>22</u>
1,500-1,999 KSh	21	<u>24</u>	<u>21</u>		<u>4</u>	<u>13</u>	<u>22</u>	<u>21</u>	<u>22</u>	<u>29</u>
2,000-3,499 KSh	20	<u>20</u>	<u>20</u>		<u>19</u>	<u>27</u>	<u>26</u>	<u>17</u>	<u>19</u>	<u>21</u>
3,500-150,000 KSh	13	<u>7</u>	<u>14</u>		<u>57</u>	<u>16</u>	<u>19</u>	<u>11</u>	<u>6</u>	<u>7</u>
N	977	424	553		118	147	273	704	297	116

Notes:

Self-reported, current, monthly, fair-market price (response to the question, “If you were to sell your house, how much do you think you could sell it for?”).

Excludes imputed owner-occupied rents.

Includes those self-declared as “skilled” as well as “professional”.



## C.4 Neighborhood Social Capital and Civic Participation

Respondents that own their homes are generally more likely than renters to participate in their community. Thirty-one percent of owners attended neighborhood forums (compared to 10% of renters). Owners are also more likely to have voted in all types of elections, though only the difference between owners and renters voting at 2007 the general elections is statistically significant (79% vs. 65%). In informal areas, significantly more male-headed households voted in local elections than female-headed households (39% vs. 23%).

Only 12% of respondents reported that they had an informal community or neighborhood leader, more concentrated among owners than renters (37% vs. 9%). Very few respondents (5%) said that they have participated in a public demonstration or protest.

The survey asked respondents whether people in their neighborhood would cooperate if asked by an official to conserve water or electricity because of an emergency, and whether people in their neighborhood look out for each other. On both questions, the results were positive. When asked if people in their community would cooperate if asked by an official, the results averaged 3.3 on a four-point scale (where 4=“very likely” and 1=“very unlikely” to cooperate). When respondents were asked if they agreed that people look out and trust each other in their neighborhood, answers averaged 4.1 on a five-point scale (where 1=“strongly disagree” and 5=“strongly agree”). On the first question, there was a slight difference between owners and renters. Sixty percent of respondents said they felt safe in their own neighborhood. There are several statistically significant differences: one was by residents’ access to infrastructure, and the other one by household head gender. In the upper half of infrastructure access, 62% of respondents felt safe in their own neighborhood compared to 57% of respondents in the lower half. Further, while 61% of male-headed households felt safe in their own neighborhood, only 45% of female-headed households expressed the same feeling.

**Table C.4a: Neighborhood social capital and civic participation**

Characteristic	All	Location		Access to infrastructure <sup>a</sup>		Gender (Informal)		Tenure <sup>b</sup>	
		Informal areas	Formal areas	Lower half	Upper half	Male-headed	Female-headed	Own	Rent
Civic participation									
Percent of households... contacting local council	12	10	12	12	12	9	9	16	12
N	1,095	459	636	528	567	323	124	101	994
attending a neighborhood forum	13	11	13	14	12	10	11	31	10
N	1,095	459	636	528	567	323	124	101	994
Social activism									
Percent of households voting in local election <sup>c</sup>	37	35	37	37	38	39	23	50	36
N	1,094	458	636	527	567	323	123	101	993
2007 general election <sup>c</sup>	67	59	67	65	69	61	54	79	65
N	1,095	459	636	528	567	323	124	101	994
2010 referendum <sup>c</sup>	68	64	68	68	68	67	58	76	67
N	1,095	459	636	528	567	323	124	101	994
Percent of households with informal community or neighborhood leader	12	17	12	14	11	19	11	37	9
N	1,068	453	615	517	551	320	121	98	970
Percent of households that took part in a public demonstration or protest	5	4	5	5	5	3	4	7	5
N	1,093	457	636	528	565	321	124	100	993

**Table C.4b: Neighborhood social capital and civic participation**

Characteristic	All	Location		Access to infrastructure <sup>a</sup>		Gender (Informal)		Tenure <sup>b</sup>	
		Informal areas	Formal areas	Lower half	Upper half	Male-headed	Female-headed	Own	Rent
Social capital									
Average household response to:									
People in my neighborhood cooperate if asked by an official <sup>c</sup>	3.3	3.3	3.3	3.2	3.3	3.3	3.3	3.5	3.2
N	1,094	459	635	527	567	323	124	101	993
People in my neighborhood look out for/trust each other <sup>d</sup>	4.1	4.0	4.1	4.0	4.1	4.0	4.0	4.4	4.1
N	1,095	459	636	528	567	323	124	101	994
Proportion of households feeling safe from crime in own neighborhood	60	56	60	57	62	61	45	62	59
N	1,095	459	636	528	567	323	124	101	994

Notes:

- Defined by assigning scores using responses from thirteen infrastructure-related questions.
- Alternatively, this could be the length of time living in the neighborhood: less/more than (say) 2 years.
- Four-point scale where 1="Very unlikely" to 5="Very likely".
- Five-point scale where 1="Strongly disagree" to 5="Strongly agree".

**D.1a Water Access**

Fourteen percent of households have a private piped water connection in their dwelling, a proportion which is significantly higher in formal areas (15%) and among non-poor households (20%) than in informal areas (5%) and poor households (12%). An additional 75% have piped water in their compound. This varies significantly by area type and respondents' security in their home ownership, where "secure" represents owners who feel no one could force them to leave without an official legal process in which they would participate, "insecure" represents owners who feel they could be forced out, and "rent" represents those who rent their homes and therefore have no security of ownership as well as squatters and those who own their dwelling but not land. Finally, seventy-three percent of households are close (within 50 meters) to a source of piped water. On average, it takes respondents over two hours a day to obtain water, including travel to and from the water source, waiting time, and filling time. Water costs an average of 739 KSh a month. Although there was not enough data at the census tract level to test for statistically significant differences between categories of households for the cost of water in time or money, we note that there are numerical differences. Households in informal areas spend more time but less money obtaining water than those in formal areas, female-headed households spend less money and time obtaining water than their male-headed counterparts, and poor households spend less time and money (643 KSh vs. 865 KSh) than wealthier households, perhaps reflecting an overall lack of resources to devote to obtaining water.

Despite the fact that 14% of households have piped water in their dwellings, only 11% of respondents report that piped water is their most important water source. Sixty-nine percent of households report that their most important source of water is a shared yard tap; another 10% name water vendors as their most important source. Non-poor households are more likely than poor households to use piped water (18% vs. 8%). Piped water services are considerably more common in formal areas than in informal settlements (12% vs. 4%), where more households primarily obtain water from vendors and neighbors. Of the households that didn't have access to piped water, the main reason given (41%) was because they rented rather than owned their home and their landlord would not pay for a connection; the second most common reason (20%) was inability to afford the initial connection (although relatively few were unable to afford a water bill). Only 3% of respondents reported that the water provider had a waiting list, and 10% said they had other sources available.

Table D.1a: Water access

Characteristic	All	Security of Ownership <sup>a</sup>			Location		Household poverty		Gender (Informal)	
		Secure	Insecure	Rent	Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of households with private piped water connection inside dwelling	14	22	10	14	5	15	12	20	6	4
N	1,095	69	30	996	459	636	693	386	323	124
Percent of households with piped water connection in compound	75	49	53	78	64	76	76	74	63	64
N	1,095	69	30	996	459	636	693	386	323	124
Percent of households close to piped water access <sup>b</sup>	73	<u>74</u>	<u>24</u>	<u>78</u>	<u>73</u>	<u>73</u>	<u>73</u>	<u>73</u>	<u>73</u>	<u>74</u>
N	238	32	14	192	143	95	172	63	102	40
Monthly cost of water in... Time (minutes) <sup>c</sup>	887	<u>633</u>	<u>4936</u>	<u>519</u>	<u>587</u>	<u>916</u>	<u>587</u>	<u>1638</u>	<u>683</u>	<u>283</u>
N	252	33	17	202	144	108	180	68	101	42
Money (KSh)	739	<u>1438</u>	<u>1142</u>	<u>537</u>	<u>479</u>	<u>757</u>	<u>643</u>	<u>865</u>	<u>524</u>	<u>391</u>
N	442	52	28	362	207	235	283	153	145	57
Most important water source: Total	100	100	100	100	100	100	100	100	100	100
Piped	11	15	10	11	4	12	8	18	4	4
Bottled	0	0	0	0	0	0	0	0	0	0
Shared tap connection	69	38	46	73	62	70	70	67	62	61
Vendor (kiosk, tanker, other)	10	1	35	10	17	10	11	9	16	19
Neighbor(s)	4	10	2	3	13	3	4	2	14	11
Well/borehole	4	19	6	2	0	4	4	3	0	1
Natural source outside household	1	5	0	0	0	1	1	0	0	0
N	1,095	69	30	996	459	636	693	386	323	124
No connection due to:	100	100	100	100	100	100	100	100	100	100
Other sources available	10	<u>6</u>	<u>38</u>	<u>9</u>	<u>17</u>	<u>9</u>	<u>8</u>	<u>12</u>	<u>17</u>	<u>16</u>
Renting <sup>d</sup>	41	<u>0</u>	<u>2</u>	<u>56</u>	<u>53</u>	<u>39</u>	<u>44</u>	<u>37</u>	<u>51</u>	<u>59</u>
Can't afford connection	20	<u>41</u>	<u>59</u>	<u>10</u>	<u>11</u>	<u>21</u>	<u>21</u>	<u>14</u>	<u>11</u>	<u>9</u>
Can't afford monthly bill	4	<u>6</u>	<u>1</u>	<u>3</u>	<u>3</u>	<u>4</u>	<u>6</u>	<u>0</u>	<u>4</u>	<u>0</u>
Provider has waiting list	3	<u>5</u>	<u>0</u>	<u>3</u>	<u>1</u>	<u>3</u>	<u>3</u>	<u>4</u>	<u>1</u>	<u>0</u>
No service available	16	<u>32</u>	<u>1</u>	<u>12</u>	<u>13</u>	<u>16</u>	<u>13</u>	<u>22</u>	<u>14</u>	<u>13</u>
Other	7	9	0	7	2	8	5	10	2	3
N	238	32	14	192	143	95	172	63	102	40

Notes:

a. Most important water source.

b. Since multiple responses were permitted, the sum can exceed 100%. Likewise, "Other" is not shown, since it was negligible, so the sum may also be less than 100%.

## D.1b Water Quality

Water quality is generally rated “good” or “fair,” although 49% of the households that obtain water from neighbours rate their water quality to be fair or poor.

Almost all respondents purchase their water from a public utility (98%). Almost a half (45%) of the households in Nakuru treat their drinking water in some way; of those that treat water, most boil it (80%) or add bleach or chlorine (76%).

**Table D.1b: Water quality**

Characteristic	All	Household poverty		Location		Water quality					Gender (Informal)	
		Poor	Non-poor	Informal areas	Formal areas	Good	Fair	Poor	Total	N	Male-headed	Female-headed
Water source: <sup>a</sup>	11	8	18	4	12	85	15	0	100	118	4	4
Piped												
Bottled	0	0	0	0	0	100	0	0	100	1	0	0
Shared tap connection	69	70	67	62	70	69	28	3	100	722	62	61
Other vendor	10	11	9	17	10	63	27	10	100	118	16	19
Neighbor(s)	4	4	2	13	3	51	26	23	100	81	14	11
Well/Borehole	4	4	3	0	4	45	51	4	100	25	0	1
Natural outside-household source	1	1	0	0	1	71	29	0	100	8	0	0
N	1,095	693	386	459	636	721	322	52			323	124
Water provider:	98	98	98	100	98	71	26	3	100	844	99	100
Public												
Private	1	1	1	0	1	100	0	0	100	7	1	0
Self	0	0	0	0	0	0	100	0	100	1	0	0
Community	1	1	1	0	1	58	42	0	100	5	0	0
N	857	521	323	316	541	586	242	29			221	84
Percent of households treating drinking water	45	46	45	37	46	70	27	3	100	462	38	34
N	1,095	693	386	459	636	721	322	52			323	124
Treatment method: <sup>b</sup> boiling	80	85	73	80	80	69	29	2	100	372	78	87
Add bleach/chlorine	76	20	31	23	24	78	20	3	100	105	118	44
Other (sieve, filter, settle)	0	0	0	0	0	100	0	0	100	3	0	2
N	462	293	164	165	297	307	141	14			118	44

Notes:

- Self-reported; “secure” includes owners who feel no one could force them to leave without an official legal process in which they would participate, “insecure” includes owners who feel they could be forced to leave without an official legal process, and “rent” includes renters, squatters, and people who own their structure but not land.
- Respondents were asked whether there were dwellings or businesses within 50 meters of their home that had a piped water connection in the dwelling or compound.
- Calculated as the sum of time spent travelling, waiting in line, and filling containers.
- House does not have a connection and landlord will not pay for one.

## D.2a Electricity and Waste-Disposal Services

Seventy-three percent of respondents reported access to electricity. Reasons for not having a connection are similar to those for water—the primary reason reported was that households did not own their home and didn’t have a choice (61%), followed by inability to pay for the initial connection (24%). Only 13% of respondents reported functional street lighting in their area, which differs significantly between formal and informal locations (29% vs. 12%).

The average monthly bill for those with electricity is 719 KSh a month. Five percent of households with electricity do not pay for it. Electricity payments are primarily made to the public utility (78%), although a few respondents pay their landlord (9%), pay a third party from utility power line (8%) or buy prepaid cards (5%). Even when electricity is available, it is not particularly reliable; 27% of respondents experience outages on a weekly basis or more.

Over a half of households (55%) reported using a collection system for refuse disposal. Twenty-three percent of all households reported getting rid of their refuse by dumping it in their neighborhood or compound. Twelve percent of them burn their refuse; this is significantly more common in formal than in informal areas (12% vs. 5%). About half of households that use a collection system pay for this service.

**Table D.2a: Access to electricity and waste-disposal**

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Electricity							
Proportion of households with access to electricity	65	53	71	61	76	53	54
N	973	490	483	660	308	380	108
Reason for no connection: Total	100	100	100	100	100	100	100
Renters	58	<u>62</u>	<u>55</u>	<u>58</u>	<u>55</u>	<u>63</u>	<u>63</u>
Firm has waiting list	6	<u>9</u>	<u>4</u>	<u>5</u>	<u>10</u>	<u>9</u>	<u>9</u>
Cannot afford connection	31	<u>27</u>	<u>34</u>	<u>33</u>	<u>26</u>	<u>25</u>	<u>28</u>
Cannot afford monthly bill	5	<u>2</u>	<u>7</u>	<u>4</u>	<u>8</u>	<u>3</u>	<u>0</u>
Other	0	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	0	0
N	363	221	142	280	80	168	52
Percent of households with mostly functioning street lighting	16	<b>25</b>	<b>13</b>	16	17	25	26
N	974	490	484	660	308	380	108
Average monthly bill, KShs	787	<u>746</u>	<u>796</u>	<u>650</u>	<u>1047</u>	<u>761</u>	<u>690</u>
N	974	490	484	660	308	380	108
Percent of households not paying for electricity	8	<u>10</u>	<u>8</u>	<u>9</u>	<u>8</u>	<u>7</u>	<u>21</u>
N	326	117	209	194	130	87	29
Payment to: Total	100	100	100	100	100	100	100
Utility	97	<u>94</u>	<u>98</u>	<u>97</u>	<u>97</u>	<u>95</u>	<u>88</u>

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Prepaid card	1	<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>
Landlord	2	<u>4</u>	<u>1</u>	<u>2</u>	<u>2</u>	<u>3</u>	<u>9</u>
Third party (from utility power line)	1	<u>2</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>2</u>	<u>4</u>
N	292	107	185	174	116	82	24
Percent of households with outages at least once weekly	20	<u>22</u>	<u>19</u>	<u>21</u>	<u>16</u>	<u>20</u>	<u>26</u>
N	608	267	341	378	228	210	56
<b>Refuse disposal</b>							
Main method:							
Dumping	23	28	23	24	21	27	31
Burying	9	9	9	10	9	9	13
Burning	12	<b>5</b>	<b>12</b>	12	11	6	2
Collection system(a)	55	55	55	53	59	55	53
N	1,094	459	635	692	386	323	124
Proportion of households paying for collection	50	<u>54</u>	<u>50</u>	<u>41</u>	<u>62</u>	<u>54</u>	<u>50</u>
N	614	257	357	371	234	182	65

Notes:

Run by city, community, or private firm.

## D.2b Access to Sanitation Services

Only 17% of households reported that they have a toilet in their home, and this significantly varies by location and poverty status; whereas 17% of households in formal areas and 28% of non-poor households have a toilet at home, only 9% of those in informal settlements and 11% of poor households have one. Most households use a public or shared latrine (46%), an individual pit latrine (28%), or a flush toilet (21%). Households in informal settlements and poor households are much more likely to use public latrines than households in formal areas and non-poor households. Non-poor households are more likely to use flush toilets than poor households (31% vs. 16%). The majority of households (74%) share a toilet with several other families. Compared to households in informal areas, significantly more households in formal areas do not share toilets at all, while significantly fewer share with 10 or more other households. Non-poor households register a similar pattern when compared to poor households. Most toilets (72%) drain into pits; more than a quarter of them (18%) use toilets connected to a sewage system, and only 2% have a septic tank instead.

“Grey water” (waste water from washing, cleaning, etc.) is generally poured out into the road or dumped down the drain. Non-poor households are more likely to dump their grey water down the drain than pour it into the street.

**Table D.2b: Access to sanitation**

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of households with toilet in home	17	9	17	11	28	8	10
N	1,095	459	636	693	386	323	124
Type of toilet system: Total							
Pit latrine (individual)	28	24	29	29	25	23	25
VIP latrine	4	2	4	3	5	2	2
Flush toilet/WC	21	18	21	16	31	19	15
Public/shared latrine	46	55	45	50	39	55	55
Paid shared latrine	0	0	0	0	0	0	1
N	1,095	459	636	693	386	323	124
Percent of households sharing toilet:							
Doesn't share	26	11	27	21	35	11	10
Shares with 2-9 other households	40	36	40	46	30	34	38
Shares with 10+ other households	34	53	33	33	35	54	52
N	1,086	453	633	686	384	319	122
Type of disposal system for toilet:							
Total	100	100	100	100	100	100	100
Pit latrine	72	71	72	76	65	72	68
Sewer (legal)	18	18	18	12	29	18	17
Sewer (informal)	7	8	7	10	3	8	10
Septic tank/soak pit	2	3	2	2	3	2	5
N	1,079	450	629	683	380	317	121
Disposal of "grey water": Total							
Total	100	100	100	100	100	100	100
Dump into drain	31	29	31	26	39	30	25
Pour onto road	63	66	63	68	54	65	69
Pour into latrine	5	6	5	4	5	5	6
Other	1	0	2	1	2	0	0
N	1,091	458	633	691	384	322	124

## D.3 Access to Transport

Most individuals (80%) work or study outside their neighborhood rather than inside. Individuals from households in formal areas are more likely to work or study outside their neighborhood than those in informal areas (81% vs. 73%). Practically all respondents commute on foot (65%) or via a matatu (27%).<sup>15</sup> Students, people in informal areas and poor households are significantly more likely to walk than workers, individuals from formal areas and from wealthier households, and typically less likely to use a matatu. Three percent of respondents declare they use their bicycles for commuting. One percent of household members drove to work or school in their own vehicle.

<sup>15</sup> A "matatu" is a 14-seater minivan used throughout Kenya as a form of public transport.



Average one-way transport time is 24 minutes. Of the respondents that had to pay to travel, the average one-way cost is 82 KSh.

Fifty-seven percent of respondents said that their access to roads is generally good, and 43% think their access is poor, especially non-poor households (49%) and female-headed households (58%). Twenty-three percent of households have limited road access during the rainy season.

**Table D.3: Access to transport**

Characteristic	All	Household activity <sup>a</sup>		Location		Household poverty		Gender (Informal)	
		Work	Study	Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent who work or study...									
inside the neighborhood	19			27	18	20	17	25	31
outside the neighborhood	80			73	81	79	82	74	69
inside and outside the neighborhood	1			0	1	1	1	1	0
N	1,504			625	879	936	543	465	144
Main mode of travel(b)	65	66	84	74	64	70	54	72	80
Walk									
Bicycle	3	6	2	4	3	3	4	5	2
Own vehicle	1	0	0	0	1	1	2	0	0
Matatu	27	25	11	19	28	24	34	20	18
Shared taxi	0	0	0	0	0	0	0	0	0
Bike taxi	2	3	3	3	2	2	4	2	1
Municipal bus	1	0	0	0	1	0	1	0	0
N	2,179	521	376	897	1,282	1,416	729	658	217
Transport time (minutes)	24	19	19	19	24	22	26	19	21
N	2,156	517	375	892	1264	1402	721	654	216
One-way trip cost to work/school (KSh)	82	35	51	39	83	64	102	37	49
N	635	150	53	203	432	347	278	156	40
Households with road access as: Poor	43			49	42	40	49	45	58
Good	57			51	58	60	51	55	42
N	1095			459	636	693	386	323	124
Percent of households with limited road access during rainy season	23			21	23	23	24	17	28
N	1095			459	636	693	386	323	124

Notes:

1. Informal areas only.
2. To work or to school. May not add to 100% since "Other", which was negligible, is not reported in table.

## D.4 Access to Communications

While land lines are practically nonexistent among households in Nakuru, mobile phone ownership is widespread. The average household owns 1.3 mobile phones. The number owned varies significantly by area type and, in informal areas, the gender of the household head. A remarkably large number of those with mobile phones use mobile banking (68%), with significant differences by area type and the gender of the household head. On the other hand, relatively few respondents have a computer (2%), though the rate of computer ownership is four times as high among non-poor households as among poor households. Only 6% reported accessing the internet using any means, a figure which is significantly higher among households in formal settlements than informal settlements (7% vs. 4%), and among non-poor households than poor households (13% vs. 4%).

**Table D.4: Access to communications**

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of households with functioning land line	0	0	0	0	0	0	0
N	1,071	325	746	793	271	231	88
Average number of mobile phones owned by household	1.3	1.2	1.3	1.3	1.3	1.3	0.8
N	1,060	323	737	785	268	229	88
Percent of households using mobile banking	68	66	68	65	76	69	58
N	1,070	325	745	792	271	231	88
Percent of households with functioning computer	2	1	2	1	4	1	0
N	1,071	325	746	793	271	231	88
Percent of households using internet (any means)	6	4	7	4	13	4	5
N	1,071	325	746	793	271	231	88

## D.5 Access to Infrastructure Indicator

The access to infrastructure indicator combines six categories of infrastructure (divided into 13 subcategories) weighted by importance to the household and summed to create a household indicator from 0 to 9.5.<sup>16</sup> Higher scores represent better access to infrastructure. This indicator provides an overall understanding of a household's infrastructure access. By averaging households' scores on the indicator, we can quickly compare infrastructure access in informal and formal areas, between poor and non-poor households, and between male- and female-headed households in informal areas.

<sup>16</sup> The 13 subcategories are: piped water (1 point); shared/indirect connection (0.5 points); direct electricity access (1); street lighting (0.5); garbage collection system (1); own toilet (1); shared toilet with less than 20 other people (0.5); legal sewer system for toilet (0.5); grey water not poured onto street (0.5); good road access at dwelling (0.5); road access not limited during rainy season (0.5); no flooding (1); no mudslides (1).

Table D.5 presents household mean scores on the access-to-infrastructure indicator. The mean score across all households in Nakuru is 3.31. Non-poor households score significantly higher than poor households. There is also a significant difference between male- and female-headed households (2.55 vs. 2.52), but the magnitude of this difference is far less than the difference between formal and informal areas.

**Table D.5: Access to infrastructure indicator**

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Mean score on access to infrastructure indicator	3.31	2.53	3.39	3.28	3.42	2.55	2.52
N	1,071	325	746	793	271	231	88

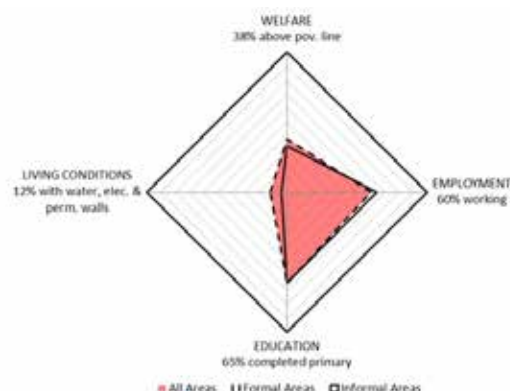
# CONCLUSIONS

The following three figures are “Development Polygons”. These polygons are meant to complement the detailed tables presented in sections A through D by illustrating an “overall” sense of the state of the city. We present information for all areas, along with formal and informal areas, in each of the three figures: the Development Diamond, the Infrastructure Polygon, and the Living Conditions Diamond.<sup>17</sup> The statistics underlying these figures are also in the tables, above. Similar graphics also appear in the City-at-a-Glance Reports and the Overview Report produced under the NORC contract.

The axes for all figures represent percentages. Polygons with larger areas represent “better” situation in regards to the associated indicator(s). Hence, a polygon with full coverage would indicate that the city is doing very well in terms of development, infrastructure, or living conditions.

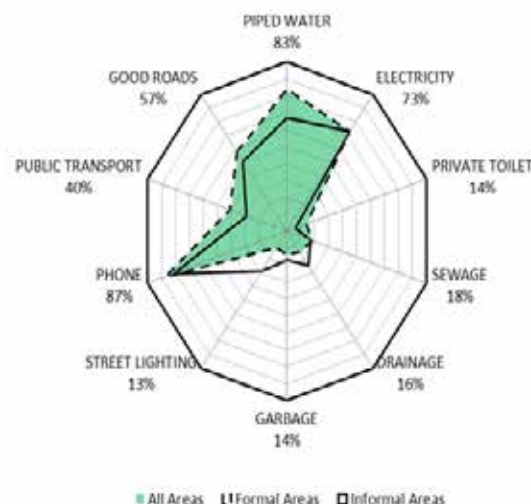
The Development Diamond (Figure 1) maps four indicators of poverty—welfare, employment, education, and living conditions. In three quarters of the development diamond—welfare, employment, and education—formal and informal areas are similarly situated. However, households in formal areas outpace the households in informal areas in terms of living conditions—in formal areas, a much larger percentage of households have permanent walls and access to both piped water and electricity (15% vs. 5% in informal areas and 14% overall).

**Figure 1: Development Diamond**



The Infrastructure Polygon, shown in Figure 2, presents residents’ access to ten different types of infrastructure—piped water, electricity, private toilets, sewage, drainage, garbage collection, street lighting, mobile phones, public transport, and good roads. Piped water is much more prevalent in formal areas than informal areas (84% and 67%), though over half of the population in all areas reports access. Private toilets are much less common overall, but we still find large differences by area type—only 6% of households in informal areas and 14% in formal areas have a private toilet. Access to sewage is quite similar in both formal and informal settlements, but still quite low (around 17%). Twenty-five percent of households or fewer have drainage, and less than 17% in informal areas and 14% in formal areas have

**Figure 2: Infrastructure Polygon**

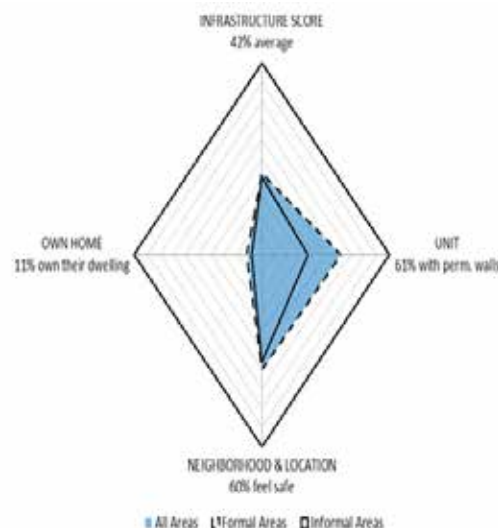


<sup>17</sup> The basic format for all three figures appear in the World Bank Policy Research Working Paper, “Poverty, Living Conditions, and Infrastructure Access” A Comparison of Slums in Dakar, Johannesburg, and Nairobi” by Sumila Gulyani, Debabrata Talukdar, and Darby Jack (2010). We strived to make our own figures as similar as possible, though some deviations, noted in the accompanying text, were necessary.

garbage collection. Interestingly, more households in informal areas report functioning street lighting than do households in informal areas—29% versus only 12%. Mobile phone usage is nearly ubiquitous, as 81% of households in informal areas and 87% of households in formal areas own one or more mobile phones. About 40% of all households report using public transport, and 57% report good roads—for both indicators, access is better in formal areas than informal areas.

Figure 3 presents the Living Conditions Diamond. The four axes of this diamond are the infrastructure score (scaled to a percentage), unit conditions, neighborhood and location, and home ownership. The first three indicators have coverage above 40%, with informal areas, as expected, scoring below formal areas. The largest difference between formal and informal areas occurs on the unit indicator—36% of households in informal areas have permanent walls, while 62% of households in formal areas do. Households in formal and informal areas exhibit similar rates of home ownership—8% of households in informal areas own their dwellings, compared to 12% of households in formal areas.

**Figure 3: Living Conditions Diamond**



**World Bank Group**  
Delta Centre  
Menengai Road, Upper Hill  
P.O. Box 30577-00100  
NAIROBI, KENYA  
Telephone: +254-020-2936000  
[www.worldbank.org/en/country/kenya](http://www.worldbank.org/en/country/kenya)

BILL & MELINDA  
GATES *foundation*

**Cities Alliance**  
Cities Without Slums

