

South Sudan

Ethiopia

Uganda

Somalia

Tanzania

Indian Ocean

Legend:

- Cities and Towns
- Cities Under the Project
- Rail Roads
- Main Roads
- Lakes
- International Boundaries

Scale: Kilometers (0, 25, 50, 100, 150, 200)

Compass Rose: N, S, E, W

Key Locations and Regions:

- Regions:** Turkana, West Pokot, Trans-Nzoia, Elgeyo-Marakwet, Uasin Gishu, Samburu, Isiolo, Meru, Tharaka Nthi, Laikipia, Nyeri, Kirinywa, Murang'a, Kiambu, Matigora, Makueni, Namanga, Vol, Kwale, Mombasa, Malindi, Lamu, Garissa, Wajir, Mandera.
- Cities and Towns:** Lodwar, Marsabit, Moyale, Mandera, West Pokot, Trans-Nzoia, Elgeyo-Marakwet, Uasin Gishu, Samburu, Isiolo, Meru, Tharaka Nthi, Laikipia, Nyeri, Kirinywa, Murang'a, Kiambu, Matigora, Makueni, Namanga, Vol, Kwale, Mombasa, Malindi, Lamu, Garissa, Wajir, Mandera.
- Cities Under the Project:** Busia, Kisumu, Bomet, Migori, Naivasha, Gilgil, Nakuru, Nyahururu, Nanyuki, Meru, Kerugoya, Sagana, Thika, Marikakos, Mayoko, Kitui, Kajjaro, Namanga, Voi, Malindi, Kilifi, Mombasa, Kwale.



WORLD BANK GROUP

KENYA STATE OF THE CITIES BASELINE SURVEY

STATISTICAL ABSTRACT FOR NAIVASHA, KENYA

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ABBREVIATIONS

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

KENYA STATE OF THE CITIES BASELINE SURVEY: CITIES COVERED



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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. 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 Naivasha, 143 EAs were selected in the first stage. In the second stage, a total of 8,708 households were listed and 1,437 households were selected.

The data for this report are based on 1,072 completed interviews carried out in Naivasha from November 12, 2012 to February 28, 2013 by a team of eight interviewers and one supervisor. Among eligible households,¹ the completion rate was 74.6%.² Data collection took place in both formal and informal settlements simultaneously; 325 interviews were completed in informal settlements and 747 were completed in formal settlements.

Questionnaire

The Kenya State of the Cities baseline 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

Recorded administration time of the CAPI instrument showed a median duration of 21 minutes in Naivasha (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 under-went 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.

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

¹ Eligible households are defined as occupied dwellings with at least one resident age 18 or older who is present during the field period.

² The completion rate is the number of households that successfully completed an interview over the total number of households assigned.

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.³

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.⁴ “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 differences in values are statistically significant, 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 (-).⁵ The table, below, summarizes the formatting used in tables throughout the Abstract: A value that is both bold and italicized indicates 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.

³ 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).

⁴ Statistical significance is noted when a test achieves a p-value ≤ 0.05 .

⁵ Regarding issues of non-response, both observational and item-specific, see Section 4, below.

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 D.1b:** 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.⁶

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.

⁶ 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
Bold	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. ^a	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. ^b	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. ^c	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.⁷

⁷ 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.

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:

- *Informal/Formal Areas* – This distinguishes between areas based on whether most households in the area have property titles 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.
- *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.
- *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.
- *Spending Power* – The total value of household expenditures collected by the survey, excluding rent or mortgage payments.
- *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.
- *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.

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.⁸ 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 Naivasha had a population of 169,142, a 7% increase over the figure reported in the 1999 census; this represents a 0.64% annualized average growth rate.⁹

The average household size in Naivasha, as reported by survey respondents, is 2.6 members. This average is considerably larger among poor households than among non-poor ones (3 vs. 2.2 inhabitants). On average, about 85.8% of households' members are aged 5 to 60 years old—12.2% are between 5 and 14 years old, 73.6% are between 15 and 60, 11.7% are under 5 and 1.6% are over 60. The head of household is female in 28% of all households. Twenty-five percent of poor households are female-headed, and 34% of non-poor households are also female-headed.

⁸ World Health Organization Global tuberculosis report 2012, retrieved June 12th 2013 from http://www.who.int/tb/publications/global_report/en/

⁹ From Statistical Abstract 2010 and Statistical Abstract 2006, Kenya National Bureau of Statistics.

Table A.1: Household demographic characteristics

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Number of households							
Weighted	45,884	4,253	41,631	32,583	12,959	3,032	1,137
N (unweighted)	1,071	325	746	793	271	231	88
Size of household	2.80	2.61	2.82	3.05	2.19	2.71	2.15
N	1,071	325	746	793	271	231	88
Mean percent of household members aged:							
Total	100	100	100	100	100	100	100
Under 5	11.7	11.0	11.8	12.9	9.0	11.5	8.9
5 to 14	12.2	10.7	12.3	14.0	7.8	8.7	14.3
15 to 60	73.6	77.0	73.3	70.4	81.7	79.3	73.2
Over 60	1.6	0.6	1.7	1.8	1.2	0.1	1.8
N	1,071	325	746	793	271	231	88
Proportion of households...							
Male-headed	72	73	72	75	66		
Female-headed	28	27	28	25	34		
N	1,047	319	728	778	262		
Female-headed distribution		9	91	65	35		
N		292	289				

A.2 Household education characteristics

Naivasha 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.¹⁰

The first panel of Table A.2 presents statistics on the education of all individuals aged 5 years and older within the surveyed households. Less than half of all individuals (32%) have completed secondary school or higher and 67% completed primary or higher. A significantly higher percentage of female-headed household members reported having attended only some primary school compared to those from male-headed households (37% vs. 26%). Primary school completion considerably varies between members from poor (24%) and non-poor households (16%). Contrarily, individuals from non-poor households are more likely to enroll in higher education than individuals from poor households (17% vs. 6%). When it comes to household location, a significantly larger proportion of individuals from informal areas only completed secondary education than individuals living in formal settlements (31% vs. 23%). In contrast, the proportion of individuals that attained any higher education grade is larger among those coming from formal areas than members of households in informal settlements (9% vs. 5%). Having “no education” is rare; is the case of only 2% of all households in Naivasha.

¹⁰ 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 Section

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, 43.2% of a Naivasha household's adults have completed secondary school or higher (31.7% completed secondary, while 11.5% completed higher education). Only about 2.3% of a household's adults had no education whatsoever. The remaining 54% completed some primary, all of primary, or some secondary schooling. We also found interesting differences between households in formal and informal areas. In formal areas, a significantly higher percentage of household's adults completed some or all of higher education (12.1% vs. 5.4%), while a significantly lower percentage completed only secondary school (30.8% vs. 40.3% of individuals from informal areas). In poor areas, a significantly higher percent of households' adults completed primary school or studied some secondary education than adults in non-poor areas, whereas significantly a larger proportion of individuals from non-poor households studied or completed higher education than members of poor households (21.9% vs. 7.5%). Finally, we found that in informal areas, a significantly higher percentage of female-headed households' adults studied some primary education than adults from male-headed households. Although the proportion of school attainment in more advanced grades is higher for adults from male-headed households, except for higher education, these differences in adults' school attainments by the gender of the household head are not statistically significant in informal areas.

Ninety-two percent of individuals aged 5 to 14 years old are currently in school; this figure is 61% for individuals 15 to 18 and 3.7% for individuals over 18. The small number of observation within enumeration areas did not allow this analysis to test for statistical significance of the differences across categories.

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 <i>individuals 5 and older</i> with highest grade completed:							
Total	100	100	100	100	100	100	100
None	2	1	2	2	3	1	2
Some Primary	31	30	31	32	26	26	37
Completed primary	22	21	22	24	16	22	17
Some secondary	13	13	13	14	10	13	13
Completed secondary	24	31	23	22	28	33	24
Higher	8	5	9	6	17	4	6
N	2,437	703	1,734	1914	509	518	162
Mean percent of household's <i>adults over 18</i> with highest grade completed:							
Total	100	100	100	100	100	100	100
None	2.3	1.1	2.4	1.8	3.2	0.7	2.2
Some Primary	12.8	12.7	12.8	13.4	11.5	9.4	20.0
Completed primary	26.8	24.6	27.1	30.2	18.9	26.4	21.1
Some secondary	14.5	15.1	14.4	16.5	8.9	15.9	13.9
Completed secondary	31.7	40.3	30.8	30.2	35.6	41.5	36.8
Higher	11.5	5.4	12.1	7.5	21.9	5.0	6.1
N	1,070	325	745	793	270	231	88

Characteristic	All	Location		Household poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Percent of <i>individuals</i> in school by age group:							
5 to 14	92.4	<u>91.9</u>	<u>92.4</u>	<u>91.7</u>	<u>95.3</u>	<u>94.3</u>	<u>91.4</u>
N	341	89	252	283	56	56	29
15 to 18	60.9	<u>53.1</u>	<u>61.6</u>	<u>53.1</u>	<u>83.1</u>	<u>34.3</u>	<u>74.6</u>
N	123	31	92	95	28	16	14
Over 18	3.7	3.6	3.7	3.9	3.3	2.4	5.6
N	1,067	323	744	790	270	230	87

A.3 Household health profile

Naivasha was part of Rift Valley Province, which in 2005 had an average of 11.5 doctors and clinical officers per 100,000 residents and 51 nurses per 100,000 residents.¹¹ The former Rift Valley Province had 11 medical facilities per 100,000 residents, including hospitals, clinics, dispensaries, and other types of facilities.¹²

Overall, 96% of households report their children under 15 have received BCG (tuberculosis) immunizations. Seventeen percent of households had a sick or injured household member in the two weeks prior to the interview, and 70% of them visited a health practitioner. On average, households in Naivasha spent 348 KSh in medical expenses over the month previous to the survey date. Rates of health insurance coverage are low (31%), and interestingly, they vary significantly by area type; whereas only 30% of households in formal areas have health insurance, 47% of households in informal areas hold insurance.

Table A.3: Household health characteristics

Characteristic	All	Location		Household 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	96	<u>97</u>	<u>96</u>	<u>96</u>	<u>98</u>	<u>97</u>	<u>100</u>
N	564	159	405	460	102	110	43
Percent of households with an injured/ill member, previous two weeks	17	18	17	19	13	18	18
N	1,071	325	746	793	271	231	88
Percent of ill household members that visit a health practitioner, previous two weeks	70	<u>82</u>	<u>69</u>	<u>72</u>	<u>62</u>	<u>80</u>	<u>85</u>
N	186	60	126	147	37	44	14
Household medical expenditures (KSh), previous month	348	491	333	318	429	420	698
N	1,061	325	736	783	271	231	88
Percent of households with health insurance	31	47	30	29	38	50	39
N	1,068	325	743	790	271	231	88

¹¹ 2004/2005 numbers of healthcare providers obtained from Partners for Health Reform plus 2006 Report, Table A1, pg. 39, Annex A, statistics obtained from Rep. of Kenya. 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).

¹² 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 four most prominent occupation categories are casual employee, regular employee, homemaker, and self-employed which together comprise about 81% of all adults in Naivasha over 18 years old. Individuals in formal areas are significantly less likely to be casual employees than individuals in informal areas. When it comes to poverty level, poor-household members are considerably more likely to be casual employees as well as homemakers than non-poor-household members. In contrast, individuals from non-poor households are significantly more likely to be regular employers and self-employed. One interesting and statistically significant finding is that a larger proportion of female-headed household members in informal areas are sick or unable to work than individuals from male-headed households in those areas (1.5% vs. 0.1%); the same is true for students (4.6% vs. 0.9%). Also, a significantly larger proportion of individuals from male-headed households are homemakers than individuals from female-headed households (15.4% vs. 5.8%).

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. We find that on average, about 70% of a household's adult members are either regular employees, casual employees, or self-employed. About 13.2% are homemakers, 5.4% are unemployed but looking for work, and only 2.6% are students; no other category includes more than 2.5% of adult household members. Our survey found that in poor households, the average percent of adults who are casual employees and homemakers (44.8% and 15.0%) are considerably larger than among non-poor households (36.1% and 8.9%). Compared to poor households, non-poor households contain, on average, a significantly higher percentage of adults who are regular employees, self-employed and earning from investments or property. In informal areas, individuals from male-headed households are more likely to be homemakers than those from female-headed households (13.8% vs. 4.4%). There are a couple of small but statistically significant differences in informal areas between individuals from male- and female-headed households that are casual employees and students; among female-headed households, a larger proportion of individuals seem to develop those occupations than among male-headed households.

Table B.1: Household members' main activity

Occupation ^a	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	0.0	0.0	0.0	0.0	0.1	<u>0.0</u>	<u>0.0</u>
Regular employee	15.7	14.7	15.8	13.5	22.3	15.3	14.3
Casual employee	38.7	47.7	37.8	40.8	31.5	47.4	50.7
Self-employed	11.2	9.9	11.3	9.3	17.1	9.8	11.7
Unpaid family worker	0.2	0.4	0.2	0.2	0.4	0.5	0.0
Apprentice	0.3	0.0	0.3	0.3	0.2	<u>0.0</u>	<u>0.0</u>
Student	3.4	1.6	3.5	2.8	5.2	0.9	4.6
Pensioner/investor	0.8	0.0	0.9	1.0	0.0	0.0	0.0
Earning from investments/ property	1.5	0.7	1.6	1.2	2.5	0.5	1.5
Sick/unable to work	0.5	0.4	0.5	0.5	0.6	0.1	1.5
Unemployed looking for work	5.7	7.4	5.5	5.9	5.0	7.3	8.7
Unemployed, not looking for work now	3.0	1.3	3.1	3.2	2.2	1.4	1.0
Homemaker	15.6	14.7	15.6	16.9	11.6	15.4	5.8
N	1,786	527	1,259	1383	394	408	108
Mean percent of household's adults over 18 with occupation: ^b							
Employer	0.0	0.0	0.0	0.0	0.1	<u>0.0</u>	<u>0.0</u>
Regular employee	16.8	15.4	17.0	13.5	25.2	15.4	16.4
Casual employee	42.6	51.7	41.7	44.8	36.1	51.5	53.8
Self-employed	10.9	9.7	11.0	8.9	16.1	9.1	12.1
Unpaid family worker	0.2	0.3	0.2	0.2	0.2	0.5	0.0
Apprentice	0.2	0.0	0.2	0.2	0.1	<u>0.0</u>	<u>0.0</u>
Student	2.6	1.1	2.7	2.4	3.0	0.5	2.7
Pensioner/investor	0.6	0.0	0.6	0.8	0.0	<u>0.0</u>	<u>0.0</u>
Earning from investments/ property	1.6	0.5	1.7	1.1	2.9	0.3	1.0
Sick/unable to work	0.3	0.3	0.3	0.4	0.3	0.1	1.0
Unemployed looking for work	5.4	6.5	5.3	5.9	4.3	6.4	7.4
Unemployed, not looking for work now	2.4	1.2	2.5	2.6	1.8	1.2	1.3
Homemaker	13.2	12.4	13.3	15.0	8.9	13.8	4.4
N	1,070	325	745	793	270	231	88

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 is derived 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 (72%) of all households in Naivasha 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, and surprisingly, it is unaffected when the head of household works either in a "skilled" or in an "unskilled" profession. However, it is significantly lower when the household has a water connection than when the household does not have a water connection.

Income and expenditure distributions vary significantly depending on: tenure status, water connection, business ownership (expenditures only), whether the household head is skilled, and in informal areas, the household head's gender (only income). Whether a household uses a water connection is a particularly strong predictor of expenditure and income levels—households with a water connection are more likely to fall into the highest income/expenditure categories and significantly less likely to be below the poverty line.

On average, households who sent money to individuals outside their household sent around 4,842 KSh in the three months prior to the interview, and those that received money received, on average, almost 5,925 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—40% of households in the top expenditure category sent money to friends or relatives, compared to only 12% of those in the bottom. In contrast, a larger proportion of households with lower income receive remittances than wealthier households; whereas 42% households in the bottom income category receive remittances, no households in the two top income categories do, and only 16% households in the third top receive remittances.

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

Characteristic	All	Location		Household has...			Household head is ^c		Gender (Informal)		Value of transfer (row pct.) ^d
		Informal areas	Formal areas	Tenure ^a	Water connection	A business ^b	Skilled	Unskilled	Male-headed	Female-headed	
Percent of households below poverty line	72	78	71	74	26	66	72	71	82	70	
N	1,064	323	741	124	31	162	314	750	230	87	
Mean expenditure (monthly KSh)	11,708	11,359	11,744	14,509	27,226	13,286	13,455	11,003	11,748	9,713	
N	1,071	325	746	124	31	162	317	754	231	88	
Percent of households with expenditure: ^d											
Less than 3,000 KSh	2	2	2	5	0	1	1	3	2	3	4,298 (12%)
3,001-6,000 KSh	18	16	18	17	0	7	12	20	15	22	2,498 (36%)
6,001-9,000 KSh	25	29	25	25	5	31	23	26	30	29	3,704 (41%)
9,001-30,000 KSh	25	23	25	13	17	23	26	25	23	24	4,025 (43%)
13,001-18,000 KSh	15	18	15	19	17	21	19	13	20	15	4,278 (39%)
18,001-30,000 KSh	11	9	11	11	30	11	12	10	8	8	5,944 (45%)
31,001-75,000 KSh	4	2	4	10	27	6	6	3	2	0	15,195 (39%)
Above 75,000 KSh	0	0	0	1	3	0	0	0	1	0	15,696 (40%)
N	1,071	325	746	124	31	162	317	754	231	88	429
Cash transfers ^e	4,842	<u>4,131</u>	<u>4,961</u>	<u>6,694</u>	<u>7,120</u>	<u>6,276</u>	<u>5,013</u>	<u>4,676</u>	<u>3,792</u>	<u>5,204</u>	
N	150	43	107	33	5	20	41	109	27	16	

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 ^(c)		Gender (Informal)		Value of remittance (row pct.) ^e
		Informal areas	Formal areas	Tenure ^a	Water connection	A business ^b	Skilled	Un-skilled	Male-headed	Female-headed	
Proportion of households with income: ^d											
Less than 3,000 KSh	7	7	7	12	0	7	1	10	4	16	4,714 (42%)
3,001-6,000 KSh	20	23	20	17	0	19	21	20	21	29	3,612 (14%)
6,001-9,000 KSh	27	32	27	20	8	24	24	28	34	24	5,369 (11%)
9,001-30,000 KSh	21	20	21	13	5	16	22	20	19	22	5,628 (10%)
13,001-18,000 KSh	15	11	15	22	6	22	14	15	12	5	9,065 (11%)
18,001-30,000 KSh	8	6	8	10	38	8	12	6	7	3	13,896 (16%)
31,001-75,000 KSh	2	1	2	5	40	3	6	1	1	0	-
Above 75,000 KSh	0	0	0	1	3	1	0	0	0	0	-
N	1,022	311	711	120	30	147	307	715	222	83	123
Cash remittances ^e	4,842	4,131	4,961	6,694	7,120	6,276	5,013	4,676	3,792	5,204	
N	150	43	107	33	5	20	41	109	27	16	

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 24.7 means that the average household owned approximately 24,700 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.

This value is significantly higher in formal than informal areas, non-poor vs. poor households, and male- vs. female-headed households (in informal areas). There are significant differences by area type in the holdings of Class-1 durables. Poverty level delineates statistically significant differences in the holdings of Class-3 durables and entertainment equipment.

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.

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 ^a	24.7	20.4	25.2	23.3	28.7	21.4	17.9
N	1,071	325	746	793	271	231	88
Household's average holdings of:							
Class-1 durables (furniture, pans, iron, mosquito net) [7]	5.1	4.7	5.1	5.1	5.2	4.7	4.8
Class-2 durables (stove, sewing machine, fan, wheelbarrow, water storage tank) [60]	1.1	1.0	1.1	1.1	1.1	1.0	1.0
Class-3 durables (refrigerator, washing machine, electric generator, bicycle) [100]	0.1	0.1	0.1	0.1	0.2	0.1	0.0
Farm animals (poultry and livestock) [200]	0.1	0.0	0.1	0.1	0.2	0.0	0.0
Entertainment equipment (radio, TV, satellite dish, DVD, video player) [80]	1.7	1.6	1.7	1.6	1.8	1.7	1.4
Motorized transport (motorcycle [400], car [1,000])	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N	1,071	325	746	793	271	231	88
Value of primary residence, not its land (in 1,000 KSh) ^b	-	-	-	-	-	-	-
N	1,071	325	746	793	271	231	88
Value of primary residence and its land (in 1,000 KSh) ^b	652	<u>558</u>	<u>832</u>	<u>558</u>	<u>832</u>	<u>100</u>	0
N	27	1	26	16	11	1	0
Value of other land and/or residence (in 1,000 KSh) ^c	642	0	<u>641.9</u>	<u>641.9</u>	0	0	0
N	3	0	3	3	0	0	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 97% 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.

B.4 Household finance

Around 68% of all households in Naivasha have a bank account, a number that differs significantly between poor and non-poor households. However, the percentage of households with loans is extremely low, and most loans (6% of households) are obtained from banks, and non-poor households are three times as likely to obtain bank loans as poor households. Consistent with findings mentioned above, far more households (41%) sent money to people not living at the household than received money (15%). There are not significant differences in the proportion of households that either send or receive money across categories.

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	68	69	68	65	78	72	60
N	1,067	325	742	789	271	231	88
Percent of households with a loan	11	9	11	8	17	9	6
N	1,071	325	746	793	271	231	88
Percent of households with a loan from a...							
Bank	6	4	6	4	12	72	60
Microfinance institution	1	1	1	1	2	1	1
Savings/credit group or co-op	3	4	3	3	3	4	2
Relative/friend	2	1	2	2	2	1	2
Informal lender	0	0	0	0	0	0	0
N	1,071	325	746	793	271	231	88
Percent of households receiving cash from those not now living at residence ^a	15	14	15	16	13	12	18
N	1,071	325	746	793	271	231	88
Percent of households sending cash to those not now living at residence ^a	41	47	41	42	38	49	42
N	1,071	325	746	793	271	231	88

Notes:

a. Over the previous twelve months.

B.5 Household-owned business profile

Seventeen percent of households own a business, most of which (52%) engage in some form of selling. These businesses tend to be fairly new and quite small, as the average age for a business is one and one-half years 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 (21%) or not at all (73%), and 46% of businesses do not pay fees or taxes. 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 households with business ownership, last 12 months	17	14	17	16	20	14	16
N	1,071	325	746	793	271	231	88
Type of business: ^a							
Manufacturing	8	<u>10</u>	<u>8</u>	<u>7</u>	<u>11</u>	<u>11</u>	<u>9</u>
Selling	52	<u>69</u>	<u>50</u>	<u>55</u>	<u>45</u>	<u>77</u>	<u>49</u>
Transport	9	<u>2</u>	<u>10</u>	<u>11</u>	<u>5</u>	<u>3</u>	<u>0</u>
Professional (including Internet)	0	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>
Other (barber, cleaning, etc.)	31	21	31	25	42	12	41
N	162	48	114	115	47	33	15
Years in operation	1.5	<u>1.1</u>	<u>1.5</u>	<u>1.8</u>	<u>0.9</u>	<u>1.4</u>	<u>0.6</u>
N	162	48	114	115	47	33	15
Number of employees	1.7	<u>1.6</u>	<u>1.7</u>	<u>1.8</u>	<u>1.6</u>	<u>1.7</u>	<u>1.4</u>
N	162	48	114	115	47	33	15
Which are...							
Household members	1.3	<u>1.2</u>	<u>1.3</u>	<u>1.3</u>	<u>1.2</u>	<u>1.2</u>	<u>1.1</u>
N	162	48	114	115	47	33	15
Non-household members	0.4	<u>0.4</u>	<u>0.4</u>	<u>0.5</u>	<u>0.4</u>	<u>0.5</u>	<u>0.3</u>
N	162	48	114	115	47	33	15
Revenue in previous month ^b	14,693	<u>12,858</u>	<u>15,666</u>	<u>13,614</u>	<u>16,004</u>	<u>14,636</u>	<u>8,827</u>
N	198	107	91	102	96	74	33
Registration status:							
Local authority (municipal or city council)	21	<u>25</u>	<u>20</u>	<u>23</u>	<u>15</u>	<u>23</u>	<u>32</u>
Kenya Revenue Authority	4	<u>6</u>	<u>4</u>	<u>1</u>	<u>11</u>	<u>5</u>	<u>8</u>
Registrar of Companies	4	<u>0</u>	<u>4</u>	<u>2</u>	<u>8</u>	<u>0</u>	<u>0</u>
None of the above	73	<u>71</u>	<u>73</u>	<u>72</u>	<u>74</u>	<u>75</u>	<u>60</u>
N	162	48	114	115	47	33	15
Share of businesses making fiscal contributions:							
Daily market local fee	17	<u>7</u>	<u>18</u>	<u>18</u>	<u>15</u>	<u>9</u>	<u>0</u>
Single business permit local fee	31	<u>48</u>	<u>30</u>	<u>30</u>	<u>35</u>	<u>49</u>	<u>47</u>
Value Added Tax	6	<u>2</u>	<u>6</u>	<u>3</u>	<u>11</u>	<u>3</u>	<u>0</u>
N	162	48	114	115	47	33	15

Notes:

a. Households were allowed to choose more than one category so these figures may exceed 100%.

b. Average over only those businesses operating over the period.

DWELLING TENURE, SECURITY, AND CHARACTERISTICS

C.1 Household dwelling characteristics

On average, households in Naivasha have 2.1 people per room, a ratio that significantly differs by area type, household poverty, and the gender of household head. Households have less than one bathroom on average. Only 12% of households have a kitchen. This proportion is seven times as likely in formal settlements (14%) as in informal areas (2%) and, in informal areas, four times as likely among female-headed households (4%) than male-headed households (1%). Both are significant differences.

Most households in Naivasha cook with charcoal. Significantly higher percentages of households in formal areas use gas and firewood, while a significantly lower percentage uses charcoal. A significantly lower proportion of poor households use gas than do non-poor households; on the other hand, significantly larger proportions of poor households use charcoal.

Most households are renters (84%), with only a small percentage (14%) owning their land and structure. Significantly more owners concentrate in formal areas than in informal areas (15% vs. 3%), and more renters live in informal areas than in formal settlements (96% vs. 83%). The number of households that own land and structure in our sample is so small that it is not possible to state any assumptions regarding property ownership patterns.

People in Naivasha report that they are highly susceptible to natural and manmade hazards—54% of households report that the area around their dwelling floods during heavy rains, 16% declare they are on a hillside subject to mudslides, 52% say they live within a ten-minute walk of a formal or informal garbage dump, and 4% state that they are exposed to factory pollution in their neighborhood. Respondents from informal settlements are considerably more likely than those from formal areas to report flooding that affects households located there, as well as proximity to formal or informal garbage dumps and exposure to factory pollution. Non-poor households are more likely to suffer from flooding than poor households.

Quality of housing varies widely across location and poverty level. Seventy-eight percent of households in formal areas have stone, brick or block walls, compared to 63% of those in informal areas—a significant difference. Almost all households have an iron or grass roof (98%), and although the proportions are significantly different in poor vs. non-poor households, the difference is quite small—poor households are three percentage points more likely than non-poor households.

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	2.1	2.4	2.0	2.3	1.5	2.5	1.9
N	1,070	325	745	792	271	231	88
Number of bathrooms	0.9	0.8	0.9	0.8	1.3	0.8	0.9
N	1,071	325	746	793	271	231	88
Proportion of residences with kitchen	12	2	14	12	15	1	4
N	1,071	325	746	793	271	231	88
Primary cooking fuel:							
Electricity	1	1	1	1	1	1	1
Paraffin or kerosene	19	16	19	18	21	18	10
Gas	10	3	10	7	17	2	6
Charcoal	66	79	64	69	57	77	80
Firewood	5	1	6	6	4	0	3
N	1,051	317	734	787	257	223	88
Proportion of households that:							
Total	100	100	100	100	100	100	100
Owns the land only	0	0	0	0	0	0	0
Owns structure only	1	0	1	1	0	0	0
Owns land and structure	14	3	15	15	13	2	4
Rents	84	96	83	83	86	97	94
Squats	1	1	1	1	0	1	2
N	1,071	325	746	793	271	231	88
Pct. of households in areas subject to ^a :							
Flooding(b)	54	68	52	50	61	67	70
Mudslides(c)	16	19	16	14	20	19	17
10 minute walk to formal or informal garbage dump	52	81	49	54	45	80	83
Factory pollution (air, water, noise)	4	8	3	3	5	7	5
N	1,071	325	746	793	271	231	88
Housing quality:							
Pct. with earth/clay floor	10	12	9	9	11	12	14
Percent with grass roof	98	100	98	99	96	100	100
Percent with grass roof	0	0	0	0	0	0	0
Percent with stone/brick/block walls	76	63	78	77	76	64	62
N	1,071	325	746	793	271	231	88

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 (84%), with only a small percentage (14%) owning their land and structure. Ninety-two 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	0	0
Own structure only	1	0	1	1	0	0	0
Own land and structure	14	3	15	15	13	2	4
Rent	84	96	83	83	86	97	94
Squat	1	1	1	1	0	1	2
N	1,071	325	746	793	271	231	88
Percent of households that feel secure in ownership	92	81	93	94	87	69	100
N	124	9	115	89	35	6	3
Variability of households feeling secure ^a	0.01	0.00	0.02	0.01	0.02	0.00	0.00
N	124	9	115	89	35	6	3
Percent of households that experienced eviction	1	2	1	1	2	2	0
N	1,071	325	746	793	271	231	88
Proportion of household owners by type of land-possession document:							
Total	100	100	100	100	100	100	100
None	6	19	6	6	5	27	0
Freehold title	82	74	82	83	79	73	75
Temporary occupation license	2	0	2	2	0	0	0
Share certificate	7	8	7	6	10	0	25
Government certificate of title ^b	3	0	3	2	6	0	0
Letter from chief (provincial administration)	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0
N	127	11	116	93	34	8	3
Neighborhood mobility							
Years in dwelling	4.5	2.9	4.6	4.5	4.4	4.6	2.6
N	1,068	322	746	791	270	752	228
Years in neighborhood	6.0	4.6	6.1	6.3	5.4	6.1	4.3
N	1,065	322	743	787	271	228	88
Home loan payment as a percent of spending power ^c	18	10	18	20	14	3	23
N	17	3	14	11	6	2	1

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 (82%) reported having a freehold title for their land, while 6% reported no land possession documents whatsoever. Only one percent of households reported being evicted.

The bottom portion of Table C.2 focuses on neighborhood mobility. Households reported living an average of 4.5 years in their present dwelling, and year and a half longer in their present neighborhood. On average, households in formal areas reported living in the neighborhood significantly longer than households in informal areas. Also, male-headed households live considerably longer in their dwellings and neighborhoods than female-headed households.

C.3 Distribution of housing values and rents

Ninety-two percent of respondents that own their homes reported their home values to be between 9,000 KSh and 2.5 million KSh; the average value was about 652,000 KSh. Note that very few households—27 in total—reported home values, so these results are likely unreliable.

Average rent is 1,679 KSh per month. Rent amounts among formal areas and those paid by households headed by skilled individuals were larger than those in informal settlements and those paid by unskilled by households headed by unskilled individuals – though these differences could not be tested for significance.

Table C.3: Distribution of housing values and rents

Characteristic	All	Location		Household has...			Household head is ^c		Gender (Informal)	
		Informal areas	Formal areas	Tenure	Water connection	A business	Skilled	Unskilled	Male-headed	Female-headed
Average home value (1,000 KSh) ^a	652	100	656	652	2,467	924	1500	639	100	-
N	27	1	26	27	3	10	1	26	1	0
Distribution of home values: Total	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>	-
9,000-299,999 KSh	50	<u>100</u>	<u>49</u>	<u>50</u>	<u>0</u>	<u>18</u>	<u>0</u>	<u>50</u>	<u>100</u>	-
300,000-999,999 KSh	22	<u>0</u>	<u>23</u>	<u>22</u>	<u>0</u>	<u>45</u>	<u>0</u>	<u>23</u>	<u>0</u>	-
1,000,000-2,499,999 KSh	20	<u>0</u>	<u>21</u>	<u>20</u>	<u>50</u>	<u>26</u>	<u>100</u>	<u>19</u>	<u>0</u>	-
2,500,000-250,000,000 KSh	7	<u>0</u>	<u>7</u>	<u>7</u>	<u>50</u>	<u>11</u>	<u>0</u>	<u>7</u>	<u>0</u>	-
N	27	1	26	27	3	10	1	26	1	0
Average monthly rent (tenants) ^b	1,679	<u>1,307</u>	<u>1,723</u>		<u>6,955</u>	<u>1,709</u>	<u>2,294</u>	<u>1,400</u>	<u>1,329</u>	<u>1,255</u>
N	926	310	616		19	121	288	638	221	83
Distribution of monthly rents: Total	100	100	100		100	100	100	100	100	100
1-899 KSh	21	<u>22</u>	<u>20</u>		<u>3</u>	<u>24</u>	<u>9</u>	<u>26</u>	21	26
900-1,499 KSh	36	<u>38</u>	<u>36</u>		<u>0</u>	<u>27</u>	<u>33</u>	<u>37</u>	37	39
1,500-1,999 KSh	18	<u>31</u>	<u>17</u>		<u>4</u>	<u>13</u>	<u>18</u>	<u>19</u>	33	26
2,000-3,499 KSh	17	<u>7</u>	<u>18</u>		<u>4</u>	<u>27</u>	<u>27</u>	<u>13</u>	8	6
3,500-150,000 KSh	8	<u>2</u>	<u>9</u>		<u>89</u>	<u>8</u>	<u>13</u>	<u>5</u>	1	3
N	926	310	616		19	121	288	638	221	83

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 more likely than renters to participate in their community. Seventeen percent of owners attended local councils (compared to only 6% of renters) and 24% attended neighborhood forums (compared to 5% of renters); both proportions are significantly higher than the corresponding proportion of renters. Owners are also significantly more likely to have voted in all types of elections and participated in the 2010 referendum. Seventy percent of male-headed households in informal areas reported participating in the 2010 referendum, compared to 56% of female-headed households. This difference is statistically significant. Forty-four percent of respondents reported that they had an informal community or neighborhood leader. Very few respondents (4%) said that they had participated in a public demonstration or protest. In both cases, owners registered higher percentages than renters, and the differences are statistically significant.

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

Characteristic	All	Location		Access to infrastructure ^a		Gender (Informal)		Tenure ^b	
		Informal areas	Formal areas	Lower half	Upper half	Male-headed	Female-headed	Own	Rent
Civic participation									
Percent of households contacting local council	8	8	8	8	8	9	6	17	6
N	1,071	325	746	778	293	231	88	131	940
Attending a neighborhood forum	8	4	8	7	9	6	1	24	5
N	1,071	325	746	778	293	231	88	131	940
Social activism									
Percent of households voting in local election ^c	32	34	32	33	31	34	30	51	29
N	1,071	325	746	778	293	231	88	131	940
2007 general election ^c	65	61	66	64	68	61	58	87	61
N	1,071	325	746	778	293	231	88	131	940
2010 referendum ^c	69	67	69	68	69	70	56	89	65
N	1,071	325	746	778	293	231	88	131	940
Percent of households with informal community or neighborhood leader	44	50	44	46	41	48	57	56	42
N	1,037	318	719	755	282	227	85	128	909
Percent of households that took part in a public demonstration or protest	4	5	4	4	5	5	4	9	3
N	1,071	325	746	778	293	231	88	131	940

Notes:

- Defined by dividing the population in half based on a score assigned using responses from thirteen infrastructure-related questions (see Section 3 of Introduction.)
- Alternatively, this could be the length of time living in the neighborhood: less/more than (say) 2 years.
- Out of all households and not just those registered to vote.

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 Naivasha 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 on a five-point scale (where 1=“strongly disagree” and 5=“strongly agree”). On the first question, there was only a small but significant difference between owners and renters. On the second one, perceptions varied significantly by access to infrastructure, and between renters and owners. Moreover, seventy-two percent of respondents said they felt safe in their own neighborhood. The only statistically significant difference was by residents’ access to infrastructure. In the upper half of infrastructure access, 78% of respondents felt safe in their own neighborhood compared to 68% of respondents in the lower half.

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

Characteristic	All	Location		Access to infrastructure ^a		Gender (Informal)		Tenure ^b	
		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 ^c	3.3	3.3	3.3	3.3	3.4	3.3	3.3	3.5	3.3
N	1,071	325	746	778	293	231	88	131	940
People in my neighborhood look out for/trust each other ^d	4.0	3.8	4.0	3.8	4.0	3.9	3.7	4.3	3.9
N	1,071	325	746	778	293	231	88	131	940
Proportion of households feeling safe from crime in own neighborhood	72	73	71	68	78	75	70	80	70
N	1,071	325	746	778	293	231	88	131	940

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”.

INFRASTRUCTURE SERVICES

D.1a Water access

Only 4% of households have a private piped water connection in their dwelling, a proportion which is significantly higher among non-poor households (10%) than among poor households (1%). An additional 24% have piped water in their compound. This varies significantly by area type and gender of the household head; whereas 26% of households in formal areas have piped water in their compound, only 3% of households in informal areas have that service. Also, 4% of male-headed households have water connections in their compounds but no female-headed households do. Finally, 46% of households are close (within 50 meters) to a source of piped water. On average, it takes respondents nearly an hour per day (over 6 hours per week) to obtain water, including travel to and from the water source, waiting time, and filling time. Water costs an average of 577 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 and money obtaining water than those in formal areas, female-headed households spend more money but less time obtaining water than their male-headed counterparts, and poor households spend more time but less money than wealthier households, perhaps reflecting a trade-off between their more abundant and scarce resources to devote to obtaining water.

Following the fact that only 4% of households have piped water in their dwellings, only 2% of respondents report that piped water is their most important water source. Some 44% of households report that they use vendors (kiosks, tankers or other kind) as their most important source of water. Another 17% name shared tap connections as their primary water source, and another 13% indicate they primarily obtain water from wells or boreholes. Moreover, 5% of respondents reported bottled water as their primary source. Households in formal areas and non-poor households are more likely than those that are poor and are located in informal areas to use bottled water as their primary source. A considerably larger proportion of households in formal areas use shared tap connections than those in informal settlements (19% vs. 3%). Due to the large proportion of respondents that use vendors, their use varies across household location type, poverty level and security of ownership. Therefore, poor households, households located in informal areas, and those feeling insecure about their property ownership more often report vendors as their primary source of water. Interestingly, a larger proportion of households in formal areas obtain water from wells and boreholes than households in informal settlements (14% vs. 1%).

Piped water services are considerably more common among non-poor households than among the poor ones (6% vs. 1%). Of the households that didn't have access to piped water, the main reason given (65%) was that they rented rather than owned their home and their landlord would not pay for a connection; the second most common reason (14%) was there is no service available in their neighborhood, and some others (10%) said they are unable to afford the initial connection (although relatively few were unable to afford a water bill).

Table D.1a: Water access

Characteristic	All	Security of Ownership ^a			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	4	7	0	3	0	4	1	10	0	0
N	1071	115	9	947	325	746	793	271	231	88
Percent of households with piped water connection in compound	24	22	0	24	3	26	22	27	4	0
N	1,071	115	9	947	325	746	793	271	231	88
Percent of households close to piped water access ^b	46	<u>37</u>	<u>26</u>	<u>48</u>	<u>40</u>	<u>47</u>	<u>44</u>	<u>54</u>	39	38
N	855	81	9	765	314	541	654	196	220	88
Monthly cost of water in ... Time (minutes) ^c	387	<u>414</u>	<u>282</u>	<u>384</u>	<u>441</u>	<u>380</u>	<u>402</u>	<u>348</u>	462	377
N	784	82	7	695	281	503	599	181	201	74
Money (KSh)	577	<u>933</u>	<u>239</u>	<u>542</u>	<u>707</u>	<u>562</u>	<u>532</u>	<u>702</u>	702	746
N	822	71	6	745	266	556	619	198	189	72
Most important water source: Total	100	100	100	100	100	100	100	100	100	100
Piped	2	6	0	2	0	3	1	6	0	0
Bottled	5	2	0	5	1	5	3	8	1	0
Shared tap connection	17	15	0	18	3	19	18	18	4	0
Vendor (kiosk, tanker, other)	44	27	67	47	63	43	47	37	61	68
Neighbor(s)	8	8	8	8	4	8	9	3	3	4
Well/borehole	13	23	0	11	1	14	13	12	0	1
Natural source outside household	5	13	14	3	9	4	4	8	11	6
N	1,071	115	9	947	325	746	793	271	231	88
No connection due to:	100	100	100	100	100	100	100	100	100	100
Other sources available	7	18	44	5	0	8	5	13	0	1
Renting(d)	65	5	0	75	75	64	69	53	77	70
Can't afford connection	10	55	16	3	4	11	11	6	3	5
Can't afford monthly bill	3	1	0	3	1	3	2	7	2	0
Provider has waiting list	0	2	0	0	1	0	1	0	0	1
No service available	14	17	40	13	18	13	12	21	17	21
Other	0	1	0	0	0	0	1	0	0	1
N	850	80	9	761	314	536	651	194	220	88

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.1b Water quality

Water quality is generally rated “good” or “fair,” although 23% of the households that obtain bottled water as their primary source and 21% of those that use water vendors rate their water quality to be poor.

Almost all respondents that obtain their water from any kind of connection do so from a public utility (72%) or from the community (19%). Only 39% of the households in Naivasha treat their water in any way; of those that treat water, most boil it (66%) or add bleach or chlorine (26%).

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: ^a Piped	2	1	6	0	3	56	28	15	100	22	0	0
Bottled	5	3	8	1	5	20	56	23	100	35	1	0
Shared tap connection	17	18	18	3	19	53	37	10	100	151	4	0
Other vendor	44	47	37	63	43	37	42	21	100	524	61	68
Neighbor(s)	8	9	3	4	8	42	54	3	100	74	3	4
Well/Borehole	13	13	12	1	14	35	53	12	100	100	0	1
Natural outside- ousehold source	5	4	8	9	4	61	31	8	100	55	11	6
N	1,071	793	271	325	746	426	498	146			231	88
Water provider: Public	72	68	77	57	72	49	37	14	100	141	57	-
Private	5	4	7	0	5	57	43	0	100	14	0	-
Self	4	7	0	16	4	60	40	0	100	10	16	-
Community	19	20	16	27	19	58	33	10	100	44	27	-
N	209	133	74	11	198	106	83	20			11	0
Percent of households treating drinking water	39	51	61	51	54	38	43	19	100	566	39	40
N	1,071	793	271	325	746	426	498	146			231	88
Treatment method: ^b Boiling	66	71	55	67	66	41	39	21	100	377	65	70
Add bleach/chlorine	26	74	74	79	74	32	49	19	100	216	108	49
Other (sieve, filter, settle)	1	1	1	1	1	88	12	0	100	5	1	0
N	567	403	161	159	408	214	263	89			108	49

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.2a Electricity and waste-disposal services

Sixty-nine percent of respondents reported access to electricity, a figure that does not significantly vary by any category included in this abstract. 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 (58%), followed by inability to pay for the initial connection (25%). Only 1% of respondents reported functional street lighting in their area, which differs significantly between non-poor and poor households (2% vs. 0%).

The average monthly bill for those with electricity is 521 KSh a month. Only 4% percent of households with electricity do not pay for it. Electricity payments are primarily made to the public utility (82%), although some respondents pay their landlord instead (13%). Even when electricity is available, it is not particularly reliable; 20% of respondents experience outages on a weekly basis or more.

Half of all households (51%) reported getting rid of their refuse by dumping it in their neighborhood or compound; this is significantly more common in informal areas than in formal areas. In contrast, households in formal settlements are more likely to bury or burn their refuse than households in informal areas.

Also, households in formal settlements are considerably more likely to use a collection system than households in informal settlements (26% vs. 17%). Fifty-two percent of the households that use a collection system report they pay for this service.

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

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Electricity							
Proportion of households with access to electricity	69	68	70	68	73	68	69
N	1,071	325	746	793	271	231	88
Reason for no connection: Total	100	100	100	100	100	100	100
Renters	58	<u>83</u>	<u>56</u>	<u>60</u>	<u>53</u>	<u>85</u>	<u>79</u>
Firm has waiting list	7	<u>4</u>	<u>7</u>	<u>5</u>	<u>14</u>	<u>2</u>	<u>11</u>
Cannot afford connection	25	<u>7</u>	<u>27</u>	<u>28</u>	<u>15</u>	<u>9</u>	<u>3</u>
Cannot afford monthly bill	8	<u>6</u>	<u>8</u>	<u>7</u>	<u>12</u>	<u>4</u>	<u>7</u>
Other	2	<u>0</u>	<u>2</u>	<u>0</u>	<u>6</u>	<u>0</u>	<u>0</u>
N	327	102	225	263	63	71	29
Percent of households with mostly functioning street lighting	1	0	1	0	2	1	0
N	1,071	325	746	793	271	231	88
Average monthly bill, KShs	521	<u>341</u>	<u>540</u>	<u>413</u>	<u>754</u>	<u>339</u>	<u>356</u>
N	1,071	325	746	793	271	231	88
Percent of households not paying for electricity	4	<u>6</u>	<u>4</u>	<u>5</u>	<u>1</u>	<u>4</u>	<u>7</u>
N	283	90	193	199	80	65	23
Payment to: Total	100	100	100	100	100	100	100
Utility	82	<u>57</u>	<u>85</u>	<u>77</u>	<u>92</u>	<u>50</u>	<u>73</u>

Characteristic	All	Location		House hold poverty		Gender (Informal)	
		Informal areas	Formal areas	Poor	Non-poor	Male-headed	Female-headed
Prepaid card	0	0	0	0	0	0	0
Landlord	13	<u>36</u>	<u>10</u>	<u>15</u>	<u>8</u>	<u>41</u>	<u>24</u>
Third party (from utility power line)	5	<u>7</u>	<u>5</u>	<u>8</u>	<u>0</u>	<u>9</u>	<u>4</u>
N	268	84	184	187	78	62	21
Percent of households with outages at least once weekly	20	<u>22</u>	<u>20</u>	<u>26</u>	<u>7</u>	<u>25</u>	<u>14</u>
N	743	223	520	530	207	160	59
Refuse disposal							
Main method:							
Dumping	51	78	48	52	47	76	82
Burying	6	1	7	7	5	1	1
Burning	17	3	18	16	19	5	1
Collection system(a)	25	17	26	24	29	17	17
N	1,071	325	746	793	271	231	88
Proportion of households paying for collection	52	<u>1</u>	<u>56</u>	<u>52</u>	<u>53</u>	<u>0</u>	<u>5</u>
N	240	50	190	167	72	39	11

Notes:

a. Run by city, community, or private firm.

D.2b Access to sanitation services

Only 7% of households reported that they have a toilet in their home, and this significantly varies by location and poverty level; whereas 8% of households in formal areas have a toilet at home, only 1% of those in informal settlements have one. Likewise, 12% of non-poor households have a toilet in the dwelling compared to just 5% of poor households. Most households use a pit latrine (43%), a public or shared latrine (42%), or a flush toilet (13%). Households in formal settlements are much more likely to use a pit latrine or a flush toilet and less likely to use a public latrine. The majority of households (80%) share a toilet with several other families. Significantly more households in formal areas do not share toilets at all than households in informal areas (22% vs. 2%), while significantly fewer share with 10 or more other households (21% vs. 37%).

Most toilets (82%) drain into pits; 14% use toilets legally connected to a sewage system, and only 1% has a septic tank instead. Households in informal areas and poor households are more likely to use pit latrines as disposal systems, and the proportion of non-poor households and of those in formal areas that are connected to a legal sewer system is larger than that of poor households and in informal areas.

“Grey water” (waste water from washing, cleaning, etc.) is generally poured out into the road or dumped down the drain. Households in formal settlements are more likely to dump their grey water down the drain, and less likely to pour it into the latrine, than households in informal areas.

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	7	1	8	5	12	1	0
N	1,071	325	746	793	271	231	88
Type of toilet system: Total							
Pit latrine (individual)	43	32	44	41	49	31	35
VIP latrine	2	1	2	2	2	1	1
Flush toilet/WC	13	1	15	9	23	1	0
Public/shared latrine	42	67	39	48	26	67	64
Paid shared latrine	0	0	0	0	0	0	0
N	1,071	325	746	793	271	231	88
Percent of households sharing toilet:							
Doesn't share	20	2	22	18	25	1	5
Shares with 2-9 other households	58	60	58	59	55	60	61
Shares with 10+ other households	22	37	21	23	20	38	34
N	1,067	323	744	789	271	229	88
Type of disposal system for toilet:							
Total	100	100	100	100	100	100	100
Pit latrine	82	99	80	85	74	99	100
Sewer (legal)	14	0	15	10	23	1	0
Sewer (informal)	3	0	3	3	1	0	0
Septic tank/soak pit	1	1	1	1	2	1	0
N	1,065	324	741	790	268	230	88
Disposal of "grey water": Total							
Total	100	100	100	100	100	100	100
Dump into drain	30	19	31	31	28	23	10
Pour onto road	62	69	61	62	62	67	73
Pour into latrine	6	12	5	5	7	11	16
Other	2	0	3	2	3	0	1
N	1,069	324	745	791	271	230	88

D.3 Access to transport

Most individuals (57%) work or study outside their neighborhood rather than inside (42%). Practically all respondents commute on foot (68%) or via a matatu (11%).¹³ People in formal areas are significantly more likely to walk and use a bike taxi than individuals from informal areas. Non-poor households are more likely to own their own vehicle and to use a bike taxi than poor households. One percent of household members—all non-poor—drove to work or school in their own vehicle, and 1% of respondents use a bike taxi.

Average one-way transport time is 25 minutes. Of the respondents that had to pay to travel, the average one-way cost is 55 KSh.

¹³ A "matatu" is a 14-seater minivan used throughout Kenya as a form of public transport.

Sixty-five percent of respondents said that their access to roads is generally poor. Respondents from informal areas and non-poor households were significantly more likely to consider their road access as poor. Seven percent of households have limited road access during the rainy season.

Table D.3: Access to transport

Characteristic	All	Household activity ^a		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	42			<u>45</u>	<u>41</u>	<u>42</u>	<u>41</u>	44	46
outside the neighborhood	57			<u>55</u>	<u>57</u>	<u>58</u>	<u>57</u>	55	52
inside and outside the neighborhood	1			<u>1</u>	<u>1</u>	<u>1</u>	<u>2</u>	0	2
N	1,355			417	938	1017	330	312	101
Main mode of travel ^b Walk	68	<u>49</u>	<u>93</u>	63	69	69	65	61	66
Bicycle	3	<u>6</u>	<u>0</u>	4	2	2	4	5	0
Own vehicle	1	<u>0</u>	<u>0</u>	0	1	0	2	0	0
Matatu	11	<u>19</u>	<u>6</u>	15	11	12	10	15	16
Shared taxi	0	0	0	0	0	0	0	0	0
Bike taxi	1	<u>0</u>	<u>0</u>	0	2	1	3	0	0
Municipal bus	1	<u>2</u>	<u>1</u>	2	1	1	2	2	2
N	1,904	391	180	571	1,333	1,467	423	414	142
Transport time (minutes)	25	<u>24</u>	<u>22</u>	23	25	26	23	24	23
N	1,878	389	179	568	1310	1445	420	412	141
One-way trip cost to work/school (KSh)	55	<u>26</u>	<u>160</u>	<u>33</u>	<u>57</u>	<u>51</u>	<u>65</u>	<u>33</u>	<u>36</u>
N	568	177	11	188	380	423	141	138	48
Households with road access as: Poor	65			78	64	62	76	79	73
Good	35			22	36	38	24	21	27
N	1070			325	745	793	270	231	88
Percent of households with limited road access during rainy season	7			4	8	6	12	5	3
N	1071			325	746	793	271	231	88

Notes:

a. Informal areas only.

b. 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 Naivasha, mobile phone ownership is widespread. The average household owns 1.3 mobile phones. The number owned varies significantly by the gender of the household head. A remarkably large number of those with mobile phones use mobile banking (68%), with significant differences by poverty level. On the other hand, relatively few respondents have a computer (2%), though non-poor households are four times as likely to own a computer as poor households. Only 6% reported accessing the internet using any means, a figure which is significantly higher among non-poor households than among 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 9.5.¹⁴ 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.

Table D.5 presents household mean scores on the access-to-infrastructure indicator. The mean score across all households in Naivasha is 3.31. Households in formal areas score significantly higher than households in informal areas, but the difference in mean scores is not extremely large—less than one.

¹⁴ 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: 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

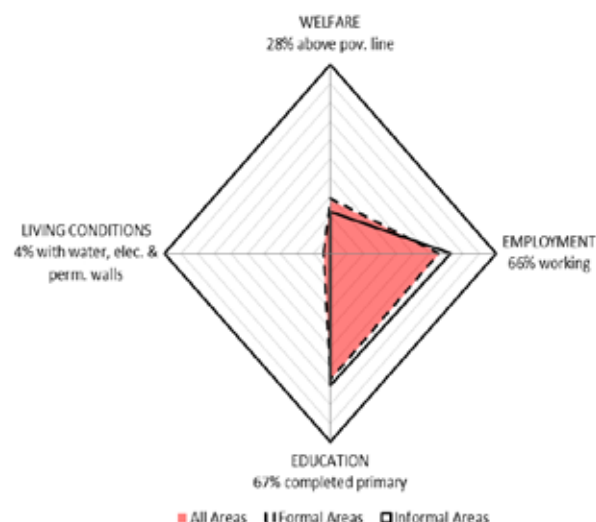
CONCLUSIONS

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.¹⁵ In all figures, the value labels included provide the value of the indicator for all areas. 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 a “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 Naivasha, indicators of welfare and living conditions are quite low and contrast between formal and informal areas, and between poor and non-poor household. In particular, non-poor households outpace the poor ones in terms of welfare conditions, and formal areas are better off than informal areas in this area. Two quarters of the development diamond – employment, and education – in formal and informal areas, and among poor and non-poor households, are similarly situated. However, households in formal areas outpace the households in informal areas in terms of living conditions - in formal areas, a larger percentage of households have permanent walls and access to piped water in compounds (26% vs. 3% in informal areas and 24% overall). The contrast in living conditions is even more notable between poor and non-poor households; whereas poor households hold an average indicator of 1, non-poor respondents hold an average indicator nine times larger.

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, an absence of flooding, and good roads. Piped water and electricity are much more prevalent in formal areas (28% and 70%, respectively) than informal areas (3% and 68%); however, the coverage of electric service is quite prevalent among all households (69%). Private toilets are much less common overall, but we still find large differences by poverty level – only 3% of poor households, compared to 12% of non-poor households, have a private toilet. Sewage follows a similar trend, shared between formal

¹⁵ 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.

and informal areas (15% vs. 0% are connected to legal sewage, respectively). Fifteen percent of households or less have drainage or garbage collection. Mobile phone usage is nearly ubiquitous, as 79% of households in informal areas and 80% of households in formal areas own one or more mobile phones. Only 18% of all households report that they use public transportation and less than a half (35%) report good roads.

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 tenure. Both the unit and the neighborhood indicators have coverage over 70%. Infrastructure indicator slightly varies between formal and informal areas (35.7% vs. 26.6%, respectively). Perceptions about security in the neighborhood somewhat vary by poverty level; while only 60% of non-poor households say they feel safe in the neighborhood, 76% of non-poor households feel safe. The largest difference between formal and informal areas occurs on the tenure indicator – only 3% of households in informal areas have secure tenure to their dwelling, while 16% of households in formal areas do. Poor and non-poor households register similar tenure percentages, 15% overall.

Figure 2: Infrastructure Polygon

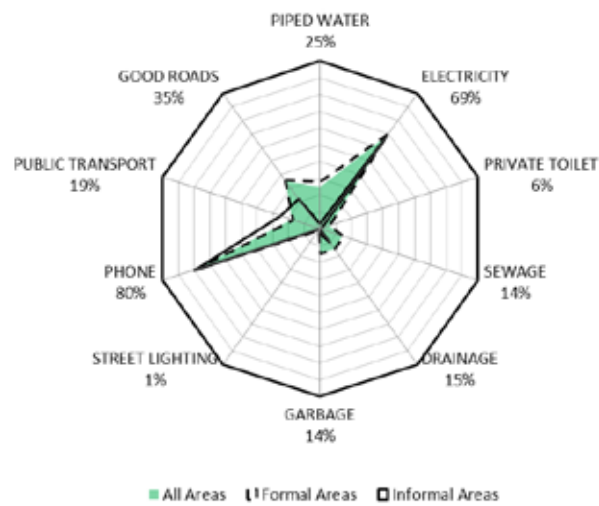


Figure 3: Living Conditions Diamond



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