



In Chapter 2

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WHAT THIS CHAPTER SHOWS

This chapter provides a brief overview of the major elements of human well-being, the definition of poverty in official Kenyan statistics, and various indicators related to well-being or lack of well-being. National maps familiarize the reader with changes in Kenya's population distribution between 1989 and 1999. Subsequent maps of selected indicators of poverty, inequity, and housing quality exhibit varying geographic patterns across Kenya. The maps indicate some convergence in spatial patterns showing that a great number of administrative areas in the central part of the country are among those considered to be better off. The maps also highlight the exceptions to this trend: some areas with low poverty rates nonetheless retain a significant density of poor people. At the same time, not all areas with high poverty rates and high poverty densities have high levels of poor housing or high inequity. A careful analysis of the spatial patterns of multiple indicators of well-being is therefore needed to better describe the poverty situation, and design and implement poverty reduction efforts.

Spatial Patterns of Poverty and Human Well-Being

This chapter presents a geospatial profile of poverty and human well-being in Kenya. Although poverty and human well-being are familiar concepts, these seemingly simple terms tend to defy precise, universally agreed definition.

Most modern experts agree that poverty is a multi-dimensional phenomenon, involving not only a lack of financial means, but also various kinds of non-monetary deprivation, such as lack of access to social services and lack of ability to participate in political, social, and cultural institutions and decision-making. As Nobel laureate economist Amartya Sen (1999) has observed, “Policy debates have indeed been distorted by overemphasis on income poverty and income inequality, to the neglect of deprivation that relates to other variables, such as unemployment, ill health, lack of education, and social exclusion.”

The maps and figures represent an attempt to capture diverse dimensions of poverty and human well-being in Kenya. Different geospatial indicators paint different pictures of poverty and human well-being; thus, it is crucially important that analysts choose indicators that are appropriate to illuminate the issue or policy choice under consideration.

The mapped indicators presented here build on the results of a 2003 poverty mapping analysis conducted by the Kenyan Central Bureau of Statistics with several partner organizations (CBS 2003). The chapter also draws on a 2005 successor analysis to fill data gaps for North Eastern Province and

to obtain information on inequity (CBS 2005). In addition, this chapter relies on detailed information from Kenya’s 1999 *Population and Housing Census* to show the spatial distribution of Kenya’s population and to construct an index of housing quality (CBS 2002).

The maps look at both rural and urban poverty, two distinctly different phenomena in Kenya. For example, the expenditure-based poverty measures from the Central Bureau of Statistics reflect cost-of-living differences for rural and urban areas. In rural areas, expenditure poverty is defined as spending less than Ksh 1,239 per month (about US\$ 0.59 per day), whereas in urban areas, the poverty line is defined as spending less than Ksh 2,648 per month (about US\$ 1.26 per day).

In addition, this chapter presents information on poverty and human well-being that is locally specific—that is, information based on data aggregated separately for each of Kenya’s local administrative units (see Boxes 2.1 and 2.2). Depending on the chosen indicator, this information may either represent a Constituency area (there are a total of 210 Constituencies in the country), or a Location (the maps show 2,070 rural Locations and 496 urban Locations), or a Sublocation (there are 6,622 Sublocations in the country).

The first cluster of maps deals with conventional economic measures of human welfare based on expenditures (so-called money-metric indicators). The rest of the chapter explores other measures of well-being, such as the Gini coefficient, which measures economic inequality; and housing quality, which reflects the overall wealth of a household.

THE DIMENSIONS OF WELL-BEING

Human well-being has many elements. Sufficient income to obtain adequate food and shelter is certainly important, but other dimensions of well-being are crucial as well. These include security, good health, social acceptance, access to opportunities, and freedom of choice. Poverty is defined as the lack of these elements of well-being (MA 2005).

Figure 2.1 Constituents of Well-Being

SECURITY - PERSONAL SAFETY - SECURE RESOURCE ACCESS - SECURITY FROM DISASTERS	FREEDOM OF CHOICE AND ACTION OPPORTUNITY TO BE ABLE TO ACHIEVE WHAT AN INDIVIDUAL VALUES DOING AND BEING
BASIC MATERIAL FOR GOOD LIFE - ADEQUATE LIVELIHOODS - SUFFICIENT NUTRITIOUS FOOD - SHELTER - ACCESS TO GOODS	
HEALTH - STRENGTH - FEELING WELL - ACCESS TO CLEAN AIR AND WATER	
GOOD SOCIAL RELATIONS - SOCIAL COHESION - MUTUAL RESPECT - ABILITY TO HELP OTHERS	

Readers should note that these maps give only a snapshot for a single period (all well-being indicators are for 1999). Spatial poverty analyses could greatly benefit from regularly updated poverty maps, especially since rapid changes in economic, environmental, and household conditions can throw people into or help people exit from poverty.

It is also important to bear in mind that all poverty indicators have shortcomings. For instance, data on poverty are often collected and recorded at the level of the household, masking important differences among family members with respect to nutritional status, access to education, and other important dimensions of well-being. In addition, there are inherent limitations in the ability to aggregate locally derived data to give meaningful results at the national level.

A central tenet of this atlas is that human well-being relies fundamentally on the ability to access a wide variety of ecosystem services. Because many of these services do not flow through markets and do not have a market price attached to their use, they are not accounted for in conventional money-metric measures of welfare, such as income or expenditures. A careful reading of this chapter should be continually informed by the awareness that, for poor people in Kenya, as elsewhere, great gains in well-being can be obtained through more equitable and secure access to local ecosystem services that are central to environmentally sustainable livelihoods.

Box 2.1 Kenya's Administrative Units

For administrative purposes, Kenya is divided into a hierarchical system of Provinces, Districts, Divisions, and smaller local administrative units known as Locations and Sublocations. This atlas presents data at the following administrative levels:

- 8 Provinces (including Nairobi)
- 69 Districts
- 210 Constituencies
- 2,566 Locations separated into 2,070 rural Locations and 496 urban Locations (covering the whole country except North East Province)
- 6,622 Sublocations (covering the whole country)

Map 2.1 shows Kenya's Provinces and Districts.

To organize elections and national parliamentary representation, the Electoral Commission of Kenya divides the country into 210 Constituencies. The voters in each Constituency area select one elected representative (i.e., Member of Parliament) to the national Parliament (CBS 2005).

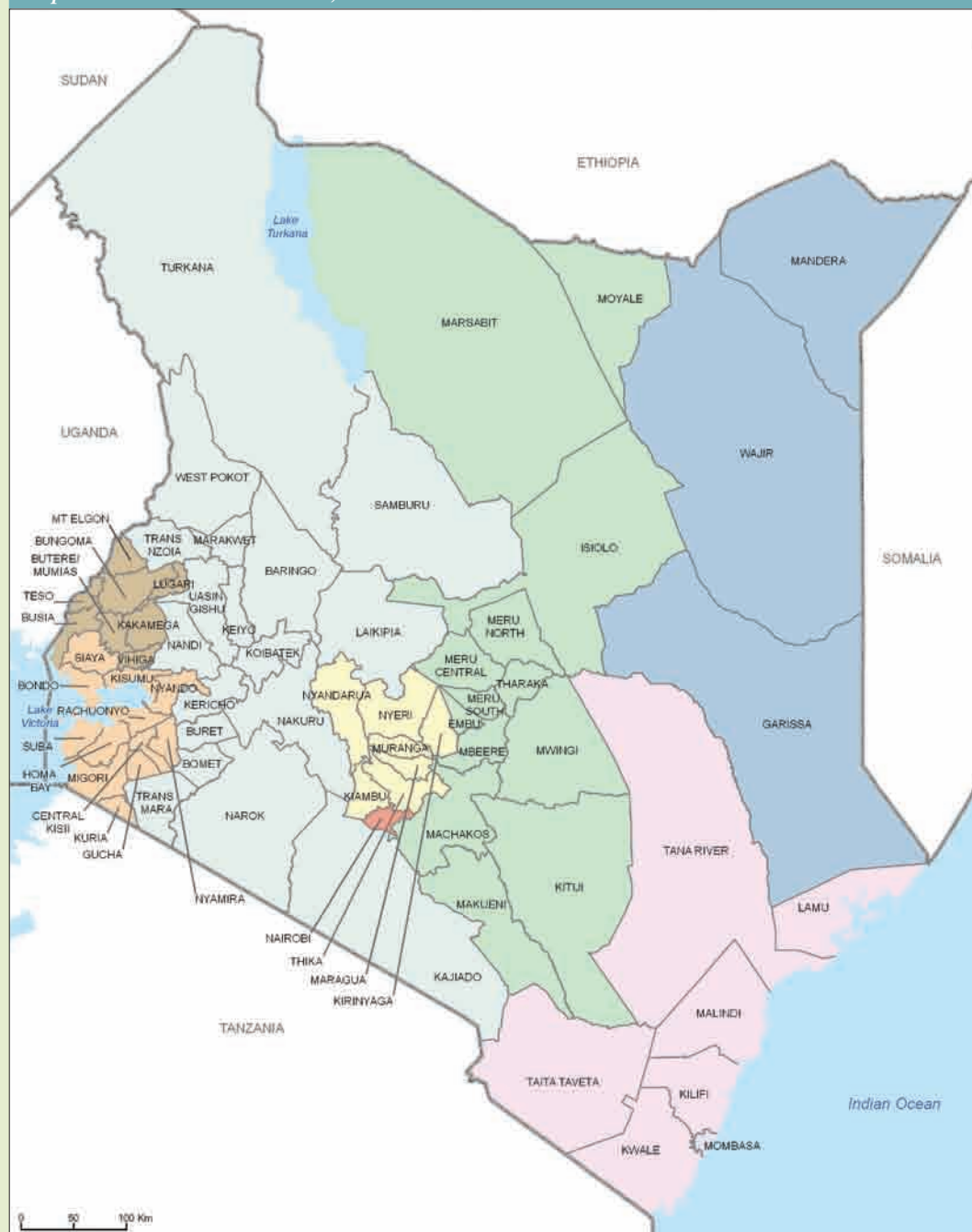
The number of administrative units and their exact boundaries has varied over the years (especially for the smaller administrative areas) due to changes in administrative or political priorities. Administrative areas shown in this publication reflect the 2003 boundaries provided by Kenya's Central Bureau of Statistics.

Sources: Administrative boundaries (CBS 2003) and water bodies (FAO 2000).

PROVINCE NAMES

- Central
- Coast
- Eastern
- Nairobi
- North Eastern
- Nyanza
- Rift Valley
- Western
- District boundaries

Map 2.1 Provinces and Districts, 2003



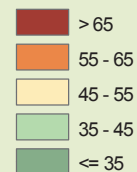
Box 2.2 The Power of Information: Disaggregated Data Makes the Difference

For spatially complex phenomena such as poverty and human well-being, data that are averaged at the Provincial and District levels can mask important local variation. By contrast, data disaggregated to more local levels can often reveal such variations.

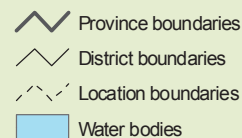
For instance, as shown in the maps of Nyanza Province, the incidence of poverty (that is, the percentage of the population living below the poverty line) at the District level is quite high across the Province's 12 Districts (Map 2.2). However, a higher-resolution map (Map 2.3) showing the incidence of poverty for the 420 Locations indicates much wider variation. It can now be seen that Locations positioned next to each other often have very different poverty rates, and that Nyanza Province, a relatively poor area, contains several pockets of relatively low poverty (shades of green in the map).



POVERTY RATE
(percent of the population below the poverty line)

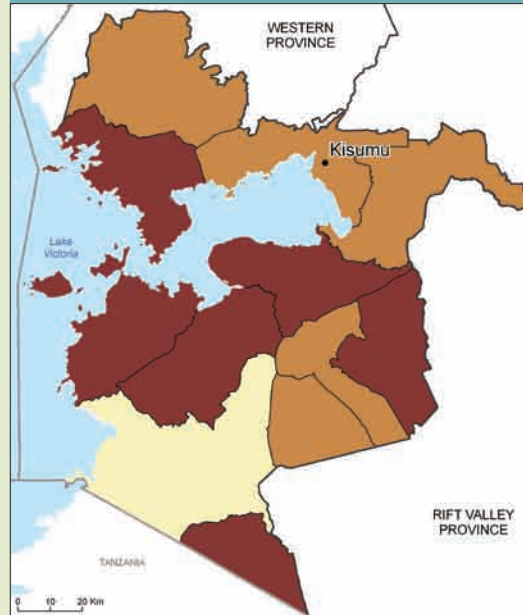


OTHER FEATURES

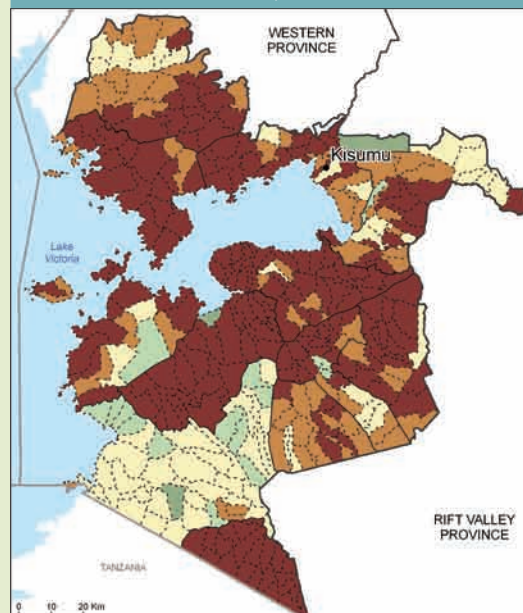


Sources: Administrative boundaries and 1999 poverty rate (CBS 2003), cities (SoK and ILRI 2000), and water bodies (FAO 2000).

Map 2.2 Nyanza Province: Poverty Rate at District Level, 1999



Map 2.3 Nyanza Province: Poverty Rate at Location Level, 1999



POPULATION DENSITY, POVERTY RATE, AND POVERTY DENSITY

Kenya's population has grown rapidly in recent years, rising to 28.7 million at the last census in 1999 (CBS 2001), a 34-percent increase over the 1989 census (CBS 1994). The country is also becoming more densely settled; population density reached 49 people per square kilometer in 1999, versus only 37 per square kilometer a decade earlier (see Maps 2.4 and 2.5). The latest estimate puts Kenya's 2004 population at 32.8 million increasing the average population density to 56 persons per square kilometer (CBS 2006).

Official Kenyan poverty statistics are based on detailed information about household expenditures on food and other items such as health and education. A poverty line—the level below which a household is considered poor—is estimated based on the minimum amount needed to purchase a basket of food providing 2,250 calories per day, along with a basic set of non-food requirements. Using survey data from 1997, Kenya's poverty line was estimated to be Ksh 1,239 per month (about US\$ 0.59 per day) for rural households and Ksh 2,648 per month (about US\$ 1.26 per day) for urban households. Given these poverty lines, about 53 percent of the rural population and 50 percent of the urban population were poor in 1997 (CBS 2003).¹

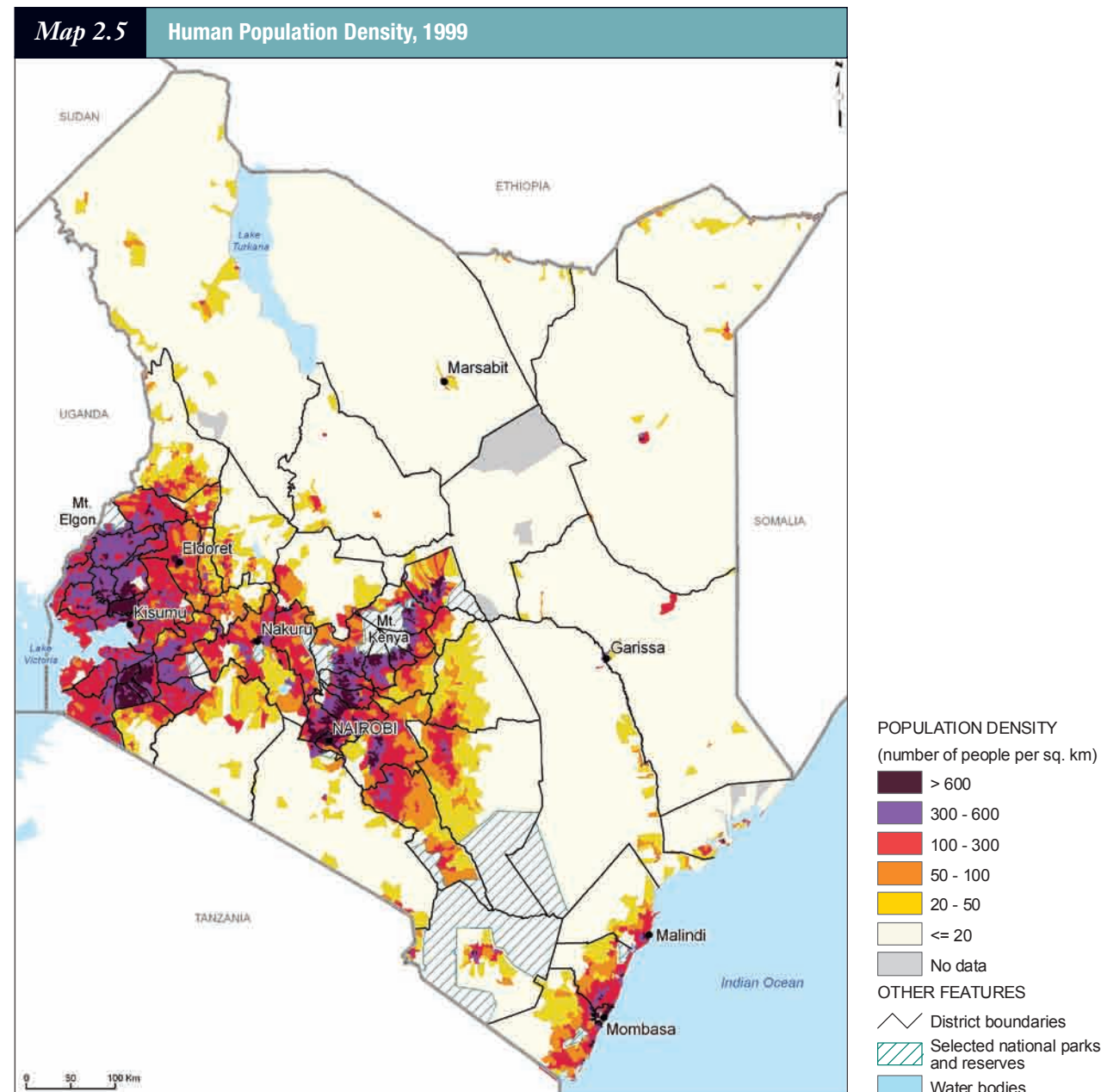
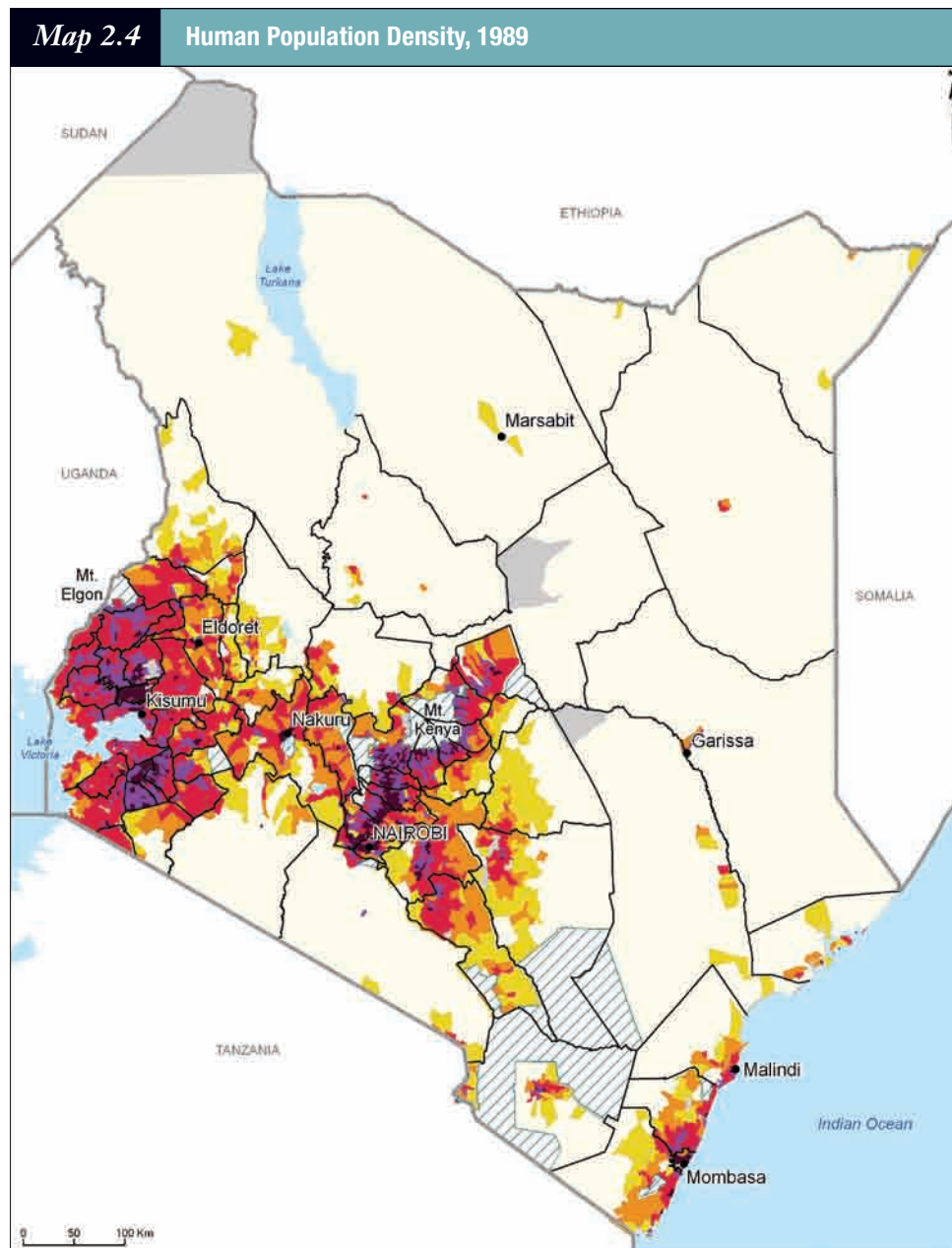
A nation's *poverty rate* is the percentage of the population below the nation's poverty line (this is also known as the "headcount ratio"). Map 2.6 shows that Kenya's spatial pattern of poverty rates varies widely across the nation. Map 2.7 depicts another way to look at the spatial distribution of poverty using *poverty density*, which is defined as the number of poor people living in a given area.

Maps of poverty density exhibit geospatial patterns that are quite different from those of poverty rates. Administrative areas in arid and semi-arid regions generally have high poverty rates but overall very low densities of poor persons per square kilo-

meter. The spatial patterns of these two indicators for large parts of the more densely settled areas are inversely related. For example, highly productive agricultural areas in Central Province have generally low poverty rates but still fairly large concentrations of poor people. Exceptions to this inverse relationship occur in western Kenya, some isolated areas in central Kenya, and along the coast, where both poverty rates and poverty densities are high (shown as dark brown in Maps 2.6 and 2.7).

Understanding the relationships between the poverty rate and the poverty density is important for designing and implementing poverty reduction interventions. Using either the poverty rate or the poverty density alone to identify areas to focus poverty programs will likely be ineffective, either missing many poor people or wasting resources on families that are not poor. For example, targeting only areas with the highest poverty rates will not reach all or most of Kenya's poor, leading to "undercoverage" of people in need, most of them in the densely settled areas of central Kenya. On the other hand, providing resources only to areas with the highest poverty densities will bypass the poor in the arid and semi-arid areas and increase the likelihood of "leakage" of poverty aid to the non-poor in areas with low poverty rates, such as the area between Nairobi and Mount Kenya.

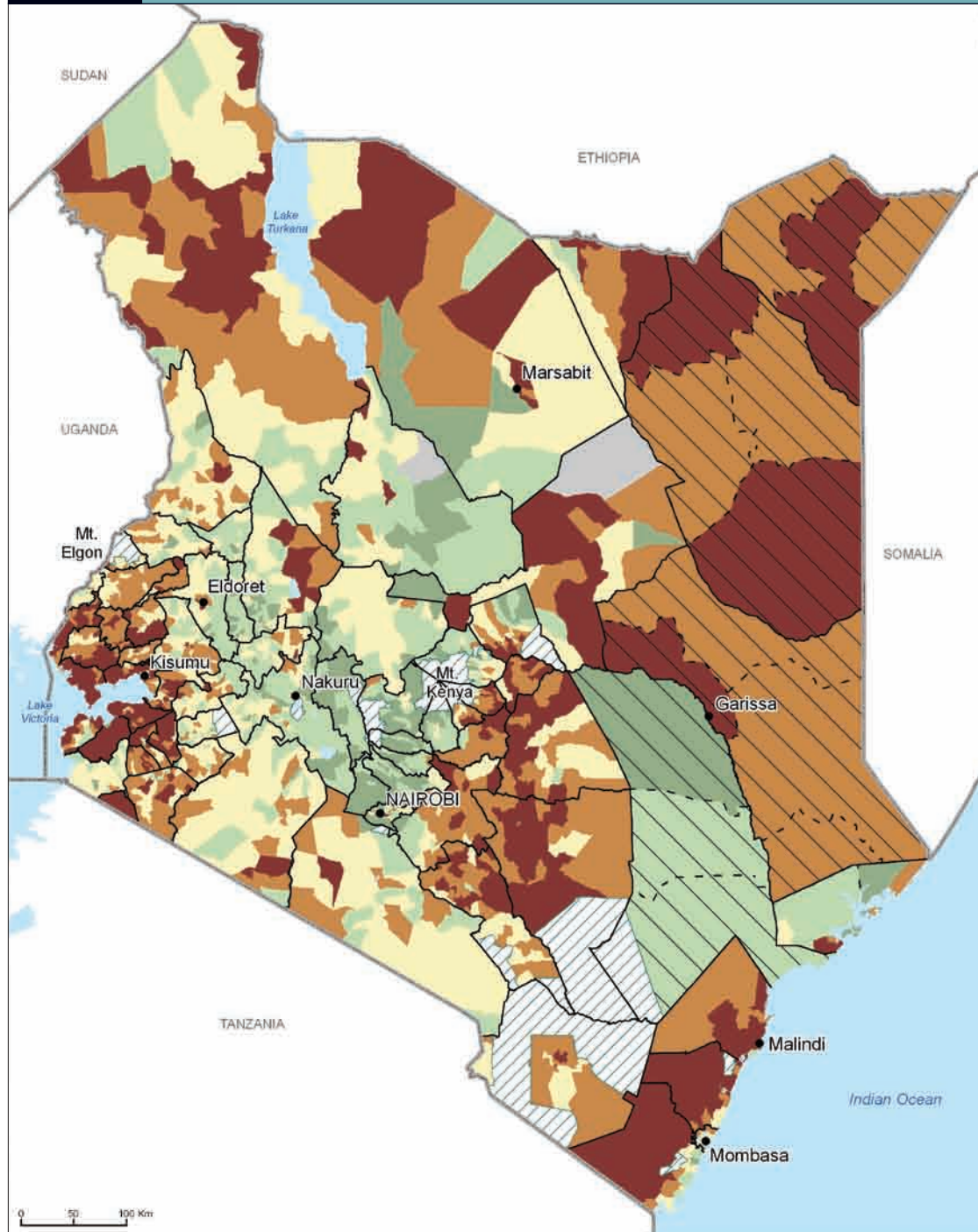
¹ Note that the maps in this chapter rely on a statistical estimation technique that combines information from the 1997 *Welfare Monitoring Survey* and the 1999 *Population and Housing Census*. Given the statistical estimation technique applied, the final estimates of these indicators refer to 1999, and the maps are labeled as such (CBS 2003 and CBS 2005).



Sources: Administrative boundaries (CBS 2003), cities (SoK and ILRI 2000), water bodies (FAO 2000), parks and reserves (IUCN and UNEP/WCMC 2006), 1989 population density (CBS 1995), and 1999 population density (CBS 2002).

Kenya's population is concentrated in the most productive agricultural lands, near major fisheries in Lake Victoria and along the Indian Ocean coast, and around important market and economic centers. Areas with the highest population density (dark purple-shaded map areas, with more than 600 people per square kilometer) are found in the central highlands between Nairobi and Mount Kenya. In western Kenya, the number of very densely populated areas has risen sharply over the past decade, with such areas found mainly northwest of Kisumu town (Western Province) and in the three Districts slightly inland from the southern shores of Lake Victoria (Nyanza Province).

Map 2.6 Poverty Rate: Percentage of Population Below the Poverty Line, 1999



Sources: Administrative boundaries (CBS 2003), cities (SoK and ILRI 2000), water bodies (FAO 2000), parks and reserves (IUCN and UNEP/WCMC 2006), 1999 poverty rate for rural Locations and urban Sublocations (CBS 2003), and 1999 poverty rate for Constituencies (CBS 2005).

The spatial distribution of poverty rates varies markedly across Kenya. Mapping poverty incidence at the local level reveals variation that is masked by maps based on average values across entire Provinces and Districts. Less poor Districts, such as those to the north and east of Mount Kenya, tend to be more spatially heterogeneous with respect to local poverty rates; here, pockets of relatively high poverty rates frequently adjoin more prosperous administrative areas. Two thirds of the 69 Districts shown contain at least one administrative area with poverty rates in excess of 65 percent.

Note: This map shows poverty rates for the smallest administrative areas available, combining estimates at three different scales: 2,056 rural Locations (covering most of Kenya), 80 urban Sublocations (Nairobi, Mombasa, Nakuru, Kisumu, and Eldoret), and 14 Constituencies (covering the northeastern part of the country). The urban estimates are based on a poverty line of Ksh 2,648 per month while the rest of the country is based on the rural poverty line of Ksh 1,239 per month. The poverty estimates for the 14 Constituencies are generally associated with a higher standard error than the other administrative units, a result of the statistical estimation technique (CBS 2005).

POVERTY RATE

(percent of the population below the poverty line)

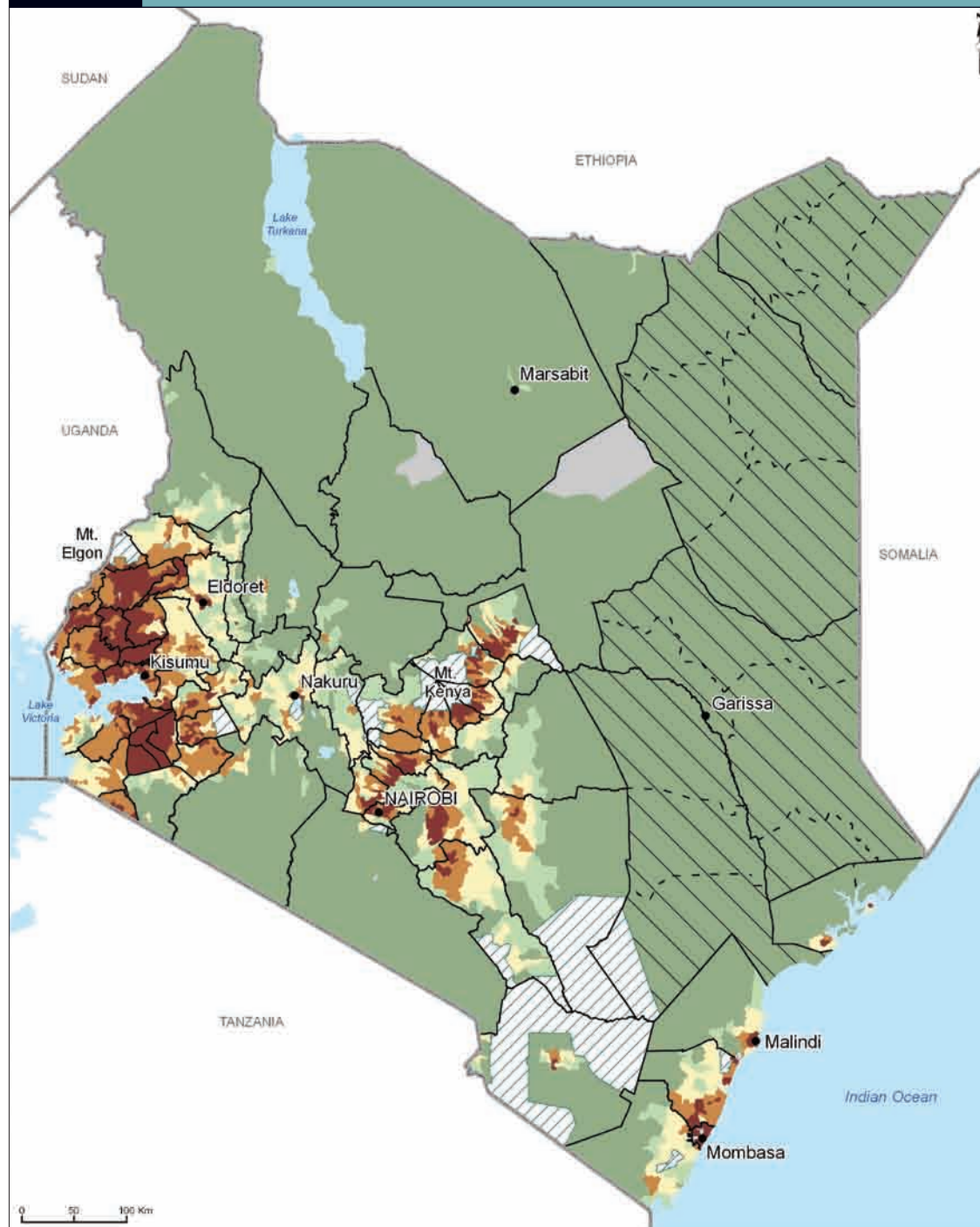
- > 65
- 55 - 65
- 45 - 55
- 35 - 45
- <= 35
- No data
- Data calculated by Constituency

OTHER FEATURES

- District boundaries
- Constituency boundaries
- Selected national parks and reserves
- Water bodies

Map 2.7

Poverty Density: Number of Poor People Per Square Kilometer, 1999



Sources: Administrative boundaries (CBS 2003), cities (SoK and ILRI 2000), water bodies (FAO 2000), parks and reserves (IUCN and UNEP/WCMC 2006), and 1999 poverty density (WRI/ILRI calculation based on 1999 poverty rates from Map 2.6).

Poverty density follows spatial patterns that are quite distinct from the distribution of poverty rates. Poverty density generally reflects patterns of overall population density. As a result, more than 60 percent of Kenya's rural poor live in just 31 percent of the 2,056 rural Locations shown on the map. Conversely, poverty density is lowest in remote, sparsely populated areas (mostly in arid and semi-arid ecosystems), even though many of these areas exhibit extremely high poverty rates.

Note: This map shows poverty densities for the smallest administrative areas available, combining estimates at three different scales: 2,056 rural Locations (covering most of Kenya), 80 urban Sublocations (Nairobi, Mombasa, Nakuru, Kisumu, and Eldoret), and 14 Constituencies (covering the northeastern part of the country). The urban estimates are based on a poverty line of Ksh 2,648 per month while the rest of the country is based on the rural poverty line of Ksh 1,239 per month. The poverty estimates for the 14 Constituencies are generally associated with a higher standard error than the other administrative units, a result of the statistical estimation technique (CBS 2005).

POVERTY DENSITY

(number of poor people per sq. km)

- > 200
- 100 - 200
- 50 - 100
- 25 - 50
- <= 25
- No data

Data calculated by Constituency

OTHER FEATURES

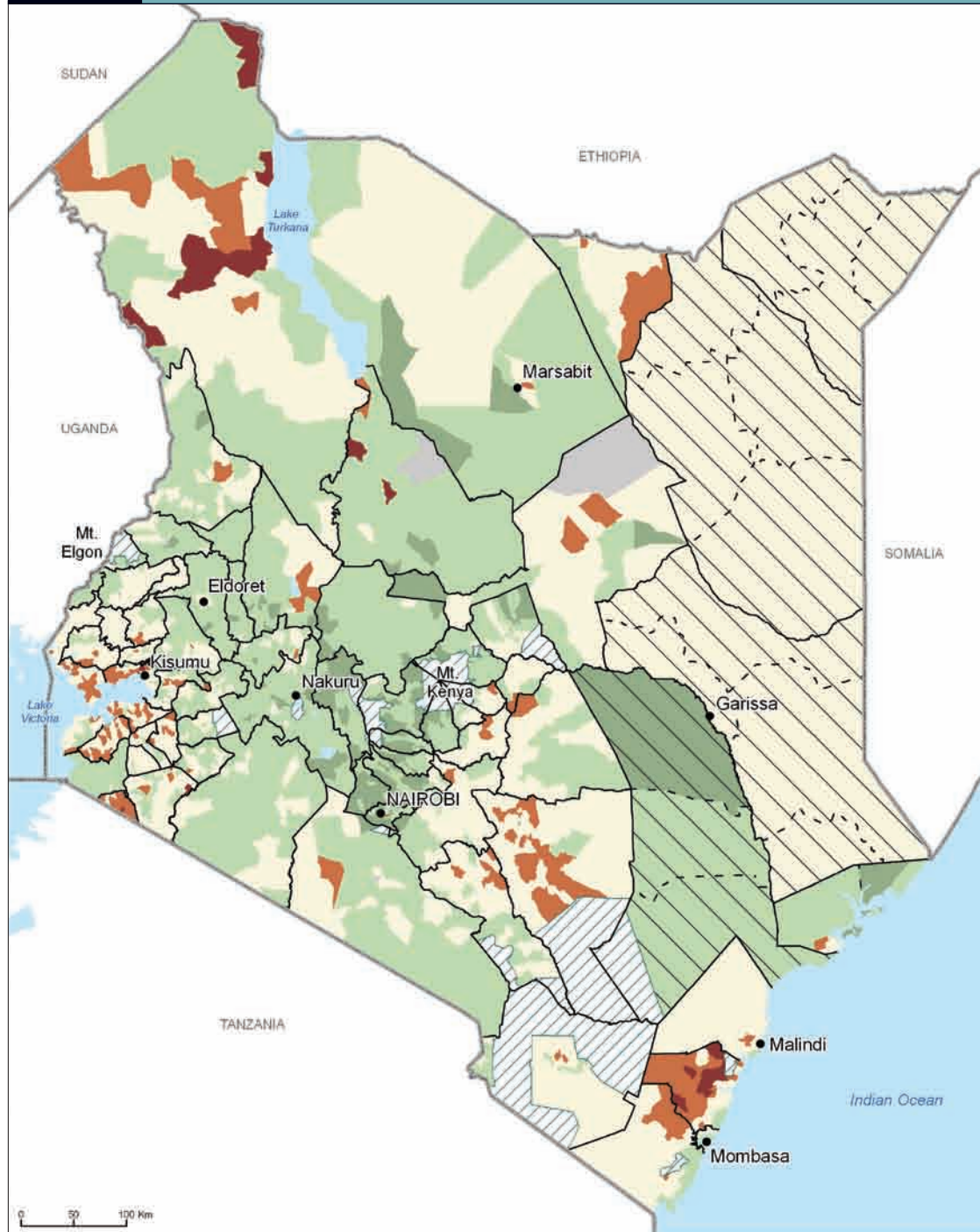
- District boundaries
- Constituency boundaries
- Selected national parks and reserves
- Water bodies

POVERTY GAP AND RESOURCES NEEDED TO CLOSE THE GAP

For some policy analysis and decision-making, it is important to know not only *how many* people are poor, but also *how poor* they are, on average. The *poverty gap* (also known as the depth of poverty) is an indicator that captures this aspect of poverty. It measures the average expenditure shortfall (gap) for the poor in a given administrative area relative to the poverty line, that is, how far below the poverty line the poor in a given area are. For example, a poverty gap of 10 percent means that, on average, the household expenditures of the poor are 10 percent below the expenditure level that defines the poverty line.

Map 2.8 depicts the poverty gap for administrative areas within Kenya. The household survey data underlying this map shows a poverty gap of 19.3 percent for the rural population of Kenya. This means that, on average, each poor person in a rural area would require an additional Ksh 239 (US\$ 3.41) per month to move out of poverty (i.e., 19.3 percent times the rural poverty line of Ksh 1,239). Note that this national average masks considerable spatial variation, with poverty gaps ranging from less than 10 percent in wealthier areas of Central and Nairobi Provinces to more than 30 percent in the poorest areas of Nyanza and Coast Provinces.

Map 2.8 Poverty Gap as a Percent of Poverty Line, 1999



Sources: Administrative boundaries (CBS 2003), cities (SoK and ILRI 2000), water bodies (FAO 2000), parks and reserves (IUCN and UNEP 2006), 1999 poverty gap for rural Locations and urban Sublocations (CBS 2003), and 1999 poverty gap for Constituencies (CBS 2005).

The poverty gap—a measure capturing not only the proportion of the population that is poor but also how poor they are—varies across Provinces and Districts. In many Locations within Central and Nairobi Provinces, poverty gaps are on the order of less than 10 percent of the poverty line (dark green-shaded map areas), meaning that the average poor person needs only about Ksh 124 (US\$ 1.77) per month to move out of poverty. In contrast, areas with large poverty gaps (brown-shaded map areas showing rates greater than 30 percent) occur in many parts of Nyanza and Coast Provinces. In these areas, more than Ksh 350 (US\$ 5.00) per month may be needed to lift the average poor person above the poverty line.

Note: This map shows poverty gaps for the smallest administrative areas available, combining estimates at three different scales: 2,056 rural Locations (covering most of Kenya), 80 urban Sublocations (Nairobi, Mombasa, Nakuru, Kisumu, and Eldoret), and 14 Constituencies (covering the north-eastern part of the country). The urban estimates are based on a poverty line of Ksh 2,648 per month while the rest of the country is based on the rural poverty line of Ksh 1,239 per month. The poverty gap estimates for the 14 Constituencies are generally associated with a higher standard error than the other administrative units, a result of the statistical estimation technique (CBS 2005).

POVERTY GAP

(percent of poverty line)

> 40

30 - 40

20 - 30

10 - 20

≤ 10

No data

Data calculated by Constituency

OTHER FEATURES

District boundaries

Constituency boundaries

Selected national parks and reserves

Water bodies

POVERTY METRICS

Poverty rate (head count index), poverty gap (depth of poverty), and squared poverty gap (poverty intensity) are the three most widely used metrics to gauge a country's poverty situation. The most easily understood measure is the *poverty rate*, which reflects how widespread poverty is in a given area (it is typically shown as the percentage of people falling below the poverty line). This measure captures changes in poverty as soon as a family moves above or below the poverty line. However, it does not reflect any changes in household expenditures or incomes that those who remain below the poverty line may make. That is, it does not probe the depth of poverty.

The *poverty gap* can capture such changes. It measures how far below the poverty line the poor in a given area are. Economists calculate the poverty gap by adding up all the shortfalls of the poor (ignoring the non-poor) and dividing it by the total population. It is possible for an area to experience a decline in the poverty gap, but no change in the poverty rate (i.e., slight increases in household expenditures or incomes that do not allow families to cross the poverty line). One of the caveats of the poverty gap is that the average used in its calculation conceals that some poor households in an area might only be a few shillings below the poverty line, while others in the same area might be much farther below the poverty line.

The *squared poverty gap* incorporates the inequality among poor people into its calculation. This measure accounts for the number of poor, the depth of poverty, and the inequality among the poor. It gives the strongest weighting to the poorest of the poor and lower weighting to less poor households (i.e., households that have higher expenditures or incomes but still fall below the poverty line).

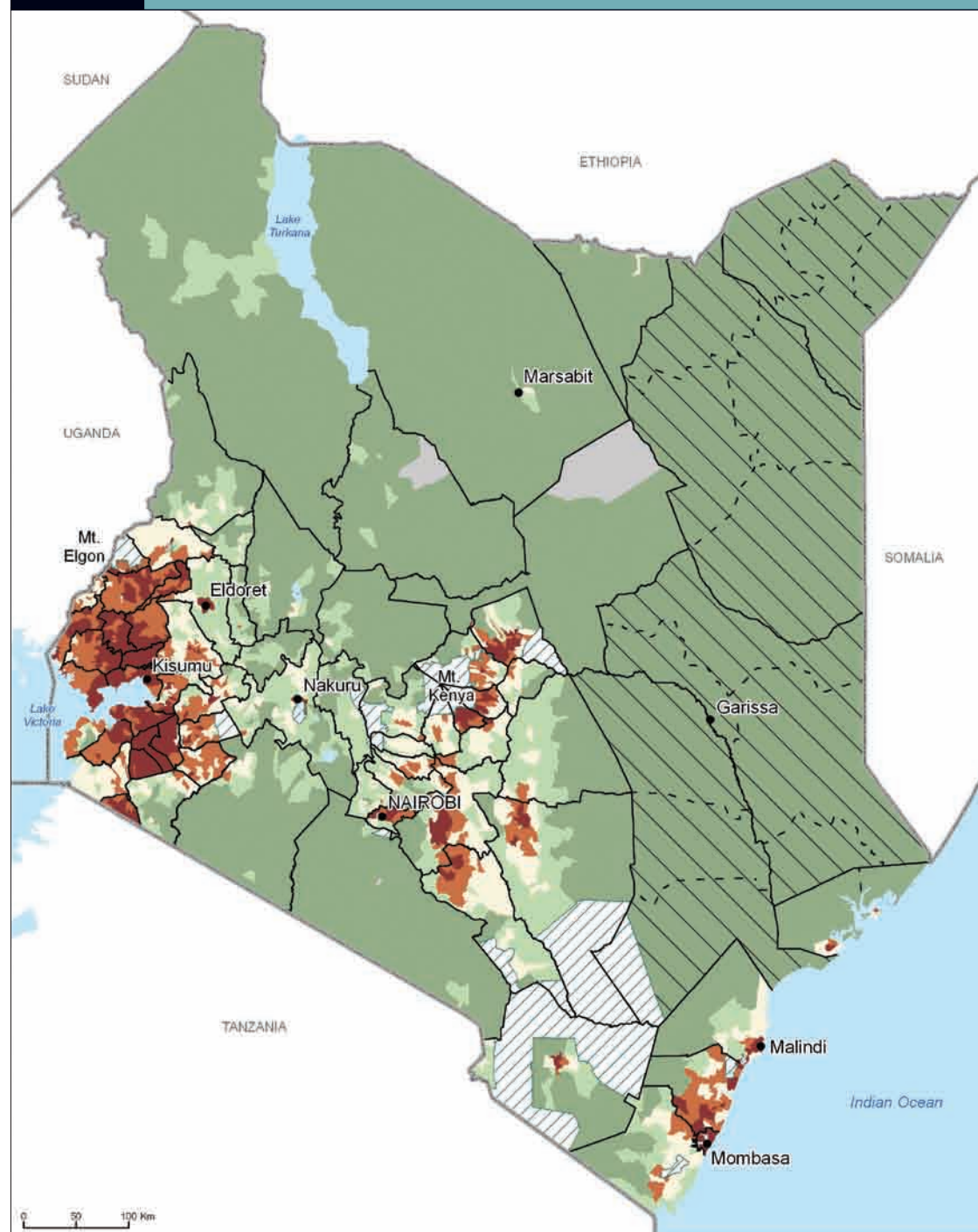
(Ravallion 1992 and CBS 2005).

The poverty gap is a crude estimate of the minimum amount of resources needed to eradicate poverty. By multiplying the poverty gap with the poverty line and the number of poor in an administrative area, analysts can determine the amount of shillings needed to lift out of poverty all of the poor in a given area. For example, given a nationwide average rural poverty gap of 19.3 percent, a rural poverty line of Ksh 1,239 per household per month, and a total population of rural poor of 11.4 million, at least Ksh 2.74 billion (US\$ 39.1 million at US\$ 1 = Ksh 70) per month would be needed to eliminate poverty for all rural Kenyan families. This is a minimum estimate based on assumptions of perfect targeting, no corruption, and no program costs. In practice more resources and different approaches will be required because perfectly targeted cash transfers are neither feasible nor the best intervention to eradicate poverty.

Map 2.9 converts the percentage figures of Map 2.8 into Kenyan shillings. It presents a standardized measure dividing the total shillings needed in each administrative area by its size in square kilometers. These standardized expenditure shortfalls are not distributed evenly across the country, but unlike in Map 2.8 the greatest amount of total resources (shown in dark brown) are now needed in areas with high poverty densities (as shown in Map 2.7).

Map 2.9

Minimum Amount of Kenyan Shillings Needed Per Square Kilometer Per Month to Close the Poverty Gap, 1999



Sources: Administrative boundaries (CBS 2003), cities (SoK and ILRI 2000), water bodies (FAO 2000), parks and reserves (IUCN and UNEP 2006), and 1999 Kenyan shillings per square kilometer (WRI/ILRI calculation for Locations, Sublocations, and Constituencies based on poverty gaps in Map 2.8).

The magnitude of resources needed to close the poverty gap (that is, to raise the entire poor population above the poverty line) varies considerably across the country. Most of the administrative areas in Kenya's arid and semi-arid lands require less than Ksh 4,000 (US\$ 57 at US\$ 1 = Ksh 70) per square kilometer per month, a result of the low density of poor people. At least 15 times that amount is needed in the densely settled areas northwest of Kisumu town, slightly inland from the southern shore of Lake Victoria, and in parts of Nairobi and Coastal Provinces. (Note that these estimates are minimum investments, based on assumptions of perfect targeting, no corruption, and no program costs.)

Note: This map shows data for the smallest administrative areas available, combining estimates at three different scales: 2,056 rural Locations (covering most of Kenya), 80 urban Sublocations (Nairobi, Mombasa, Nakuru, Kisumu, and Eldoret), and 14 Constituencies (covering the northeastern part of the country). The urban estimates are based on a poverty line of Ksh 2,648 per month while the rest of the country is based on the rural poverty line of Ksh 1,239 per month. The estimates for the 14 Constituencies are generally associated with a higher standard error than the other administrative units, a result of the statistical estimation technique (CBS 2005).

THEORETICAL INVESTMENT TO FILL THE POVERTY GAP
(Kenyan shillings per month per sq. km)

- > 60,000
- 28,000 - 60,000
- 12,000 - 28,000
- 4,000 - 12,000
- <= 4,000
- No data
- Data calculated by Constituency

OTHER FEATURES

- District boundaries
- Constituency boundaries
- Selected national parks and reserves
- Water bodies

MEASURES OF INEQUALITY AND HOUSING QUALITY

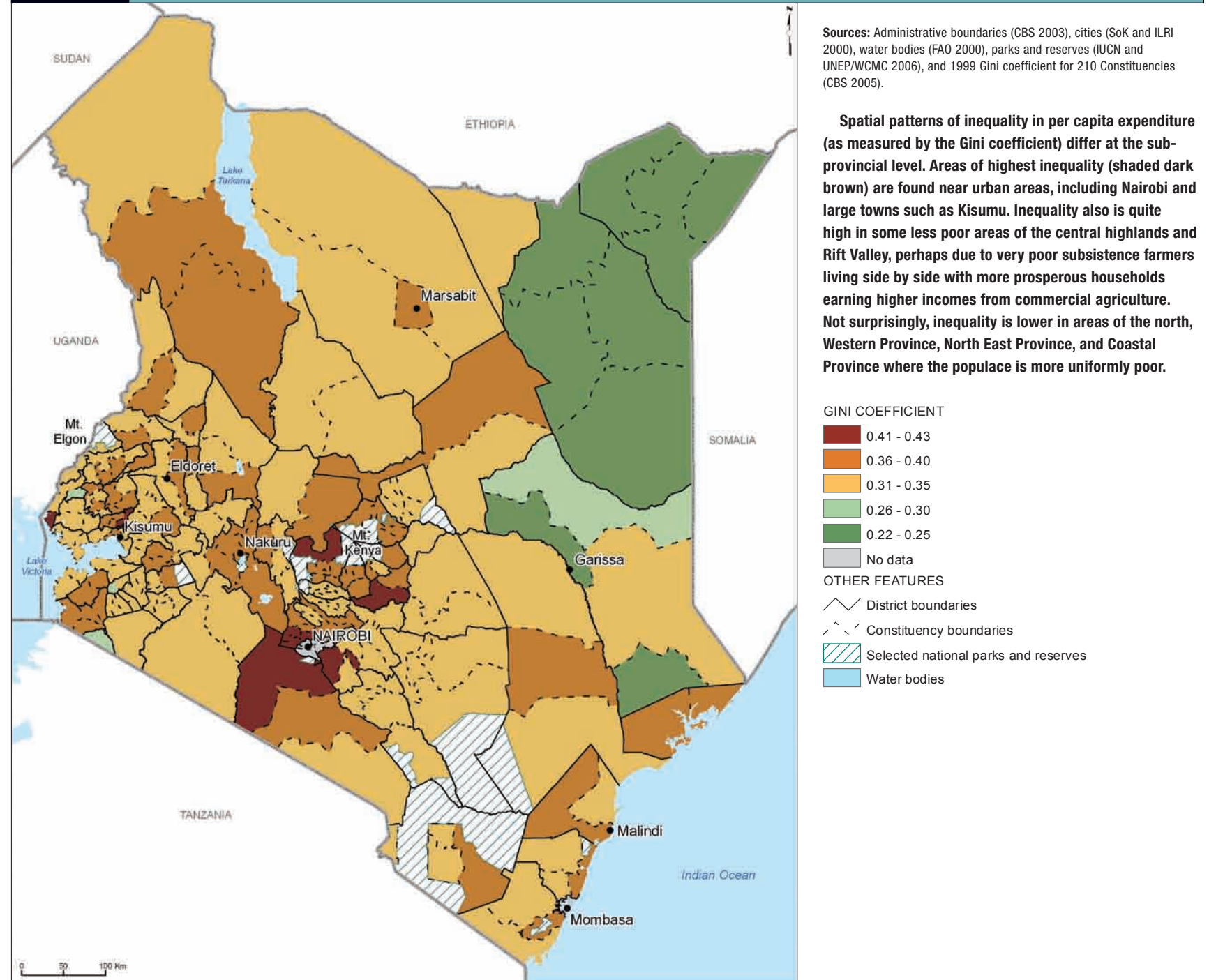
In addition to looking at spatial patterns of poverty incidence and the poverty gap, examining the spatial dimensions of economic inequality can also provide important insights for policy analysis and decision-making. Measures of inequality look at the distribution of economic welfare across the entire population (both poor and non-poor), rather than just considering the income or consumption shortfalls of the poor. Such measures can be useful indicators of a society's well-being, since high levels of economic inequality can strain the fabric of society, eroding social capital and diminishing social cohesion.

One of the principal indicators used by economists to measure inequality is the Gini coefficient, which varies between 0 (total equality, where each individual or household has the same income or expenditure) and 1 (total inequality, where one person has everything). As indicated in Map 2.10, inequality as measured by the Gini coefficient varies considerably within and between administrative areas.

As discussed earlier in this chapter, not all dimensions of human well-being can be captured by money-metric indicators of poverty or inequality. To capture one such non-monetary dimension of well-being, we constructed an index of *housing quality* using data collected from each household in Kenya's 1999 census. Map 2.11 depicts this housing quality index throughout Kenya's Districts. The index combines measures of the quality of the materials used to provide roofing, flooring, and walls in Kenyan homes. A dwelling was considered to be "poor quality housing" if it was rated as "poor" in all three categories, that is, having a "poor quality" roof, floor, and walls (see box beside Map 2.11 for further details).

Map 2.10

Average Inequality of Per Capita Expenditures, 1999



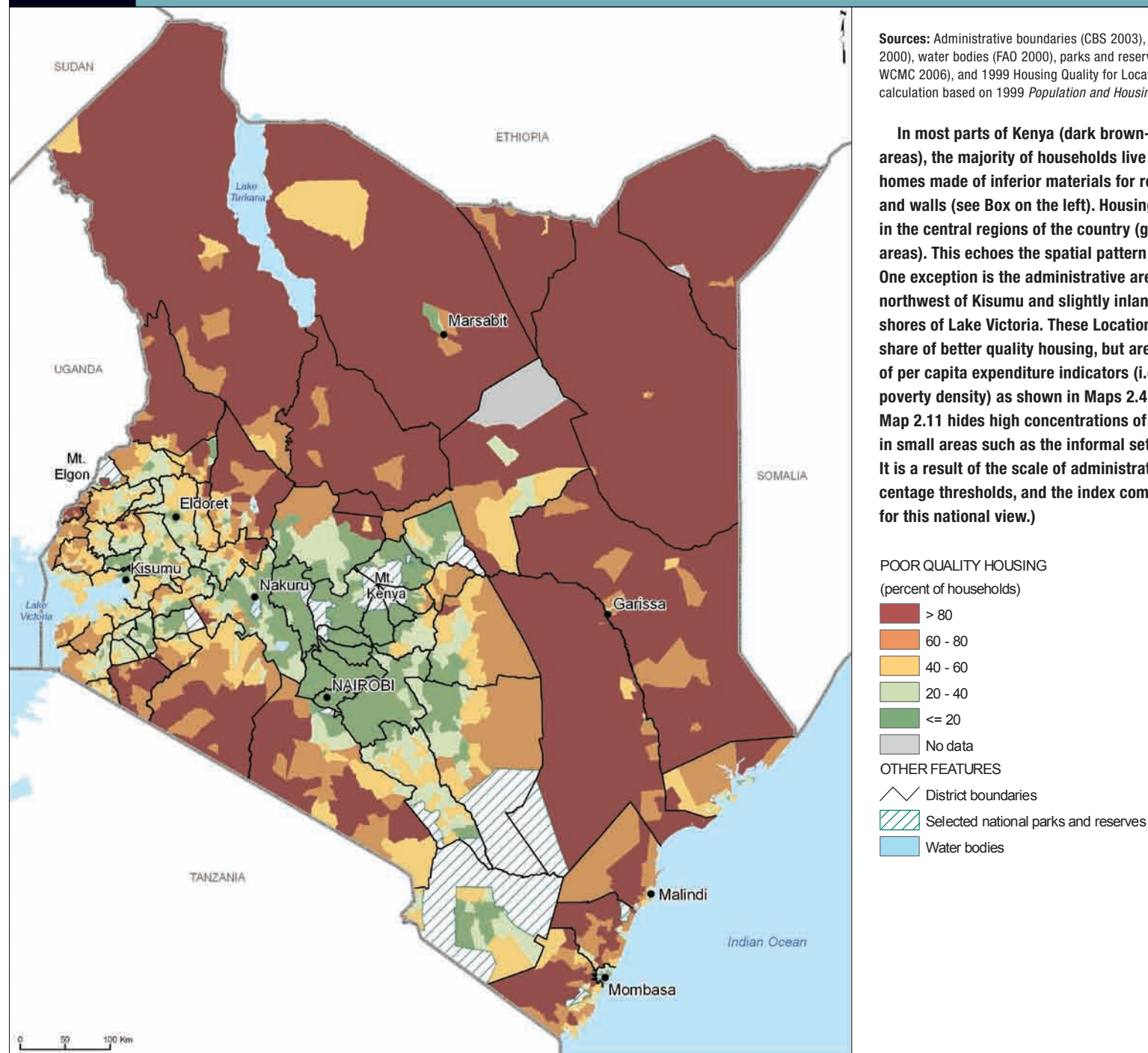
CONSTRUCTING AN INDEX OF HOUSING QUALITY

To move beyond the money-metric indicators of welfare and inequality, we calculated an index of housing quality. Housing quality captures the “shelter” dimension of well-being and may also represent a proxy of wealth.

Kenya’s 1999 *Population and Housing Census* (an often under-used source of well-being data) collected data on housing quality from each household (CBS 2002). To calculate the index, we categorized the building materials used for the roof, walls, and floors of a household’s dwelling. The census groups the roofing materials into eight classes: corrugated iron sheets, tiles, concrete, asbestos sheets, grass, *makuti* (thatched roofing material made from dried coconut palm leaves), tin, and “others.” If a household uses grass, *makuti*, tin, or “others,” then we classify it as having a “poor quality roof.” We disregard the fact that some households prefer grass-thatched houses to others. For the wall type, we use the same approach. We consider nine types of wall: stone, brick/block, mud/wood, mud/cement, wood only, corrugated iron sheet, grass/reeds, tin, and others. Households that have mud/wood, wood only, grass/reeds, tin, and “others” are classified as having “poor quality walls.” Accordingly households with “earth” and “other” floor types are classified as having “poor quality floors” compared to those that have “cement,” “tiles,” or “wood only” floor types. We assumed that no household prefers a “poor floor type” to a “non-poor” one for any reason other than the inability to afford it.

To derive an index reflecting the quality of shelter, we combined these three measures. The proportion of households in a Location with “poor quality housing” is defined as those families that rate “poor” on all three dimensions, that is, having a “poor quality roof,” “poor quality floors,” and “poor quality walls.”

Map 2.11 Percentage of Households With Poor Quality Housing, 1999



Sources: Administrative boundaries (CBS 2003), cities (SoK and ILRI 2000), water bodies (FAO 2000), parks and reserves (IUCN and UNEP/WCMC 2006), and 1999 Housing Quality for Locations (CBS/ILRI/WRI calculation based on 1999 *Population and Housing Census*).

In most parts of Kenya (dark brown-shaded map areas), the majority of households live in “poor quality” homes made of inferior materials for roofing, flooring, and walls (see Box on the left). Housing quality is higher in the central regions of the country (green-shaded map areas). This echoes the spatial pattern of poverty rates. One exception is the administrative areas in the Locations northwest of Kisumu and slightly inland from the southern shores of Lake Victoria. These Locations show a higher share of better quality housing, but are very poor in terms of per capita expenditure indicators (i.e., poverty rate and poverty density) as shown in Maps 2.4 and 2.5. (Note that Map 2.11 hides high concentrations of very poor housing in small areas such as the informal settlements of Nairobi. It is a result of the scale of administrative areas, the percentage thresholds, and the index components selected for this national view.)

SUMMING UP

- ▶ Human well-being has many elements. Sufficient income to obtain adequate food and shelter are important dimensions as are security, good health, social acceptance, access to opportunities, and freedom of choice.
- ▶ Poverty is defined as a lack of these elements of well-being.
- ▶ Human well-being relies fundamentally on the ability to access a wide variety of ecosystem services.
- ▶ The majority of the 32.8 million Kenyans (2004) live in the most productive agricultural lands, near major fisheries in Lake Victoria, and along the Indian Ocean coast. Here, rural population densities of greater than 600 persons per square kilometer are not uncommon. Most of Kenya's arid and semi-arid lands show population densities of less than 20 persons per square kilometer.
- ▶ Official Kenyan poverty statistics are based on detailed information about household expenditures. They use a rural poverty line of Ksh 1,239 per month (about US\$ 0.59 per day) and an urban poverty line of Ksh 2,648 per month (about US\$ 1.26 per day). Given these poverty lines, about 53 percent of rural and 50 percent of urban Kenyans were poor in 1997.
- ▶ *Poverty rate* (i.e., the percentage of the population below the poverty line) and *poverty density* (the number of poor in a given area) provide two distinct ways to depict the spatial distribution of poverty. Maps of these two indicators often show quite different patterns. Understanding the relationship between *poverty rate* and *poverty density* is important for designing and implementing poverty reduction interventions.
- ▶ The *poverty gap* measures how far below the poverty line the poor in a given area are. The poor in Kenya's rural areas have household expenditures that are on average 19.3 percent below the rural poverty line. On average, each rural Kenyan would require an additional Ksh 239 (US\$ 3.41 at US\$ 1 = Ksh 70) per month to move out of poverty.
- ▶ Most of the administrative areas in Kenya's arid and semi-arid lands require less than Ksh 4,000 (US\$ 57 at US\$ 1 = Ksh 70) per square kilometer per month to close the poverty gap, that is, to raise all families above the poverty line. At least 15 times that amount is needed in the more densely settled parts of the country.
- ▶ Measures of *inequality* look at the distribution of economic welfare across the entire population (both poor and non-poor). Areas of highest inequality are found near urban areas and large towns. Inequality is low in rural areas with the highest poverty rates.
- ▶ *Housing quality*, a measure reflecting overall wealth of a household, is higher in the central regions of the country.