

2.5

Slum Cities and Cities with Slums

The prevalence of slum households varies dramatically across cities of the developing world. In some cities, a relatively small percentage of households experience shelter deprivations, or many experience only one barrier to adequate housing. In other cities, a majority of dwellings suffer from two or more shelter deprivations, threatening the health, safety and well-being of their inhabitants. This section magnifies the impact of slums on cities, focusing on the spatial component of slum prevalence. It reveals the existence of entire “slum cities”, where urban services are either inadequate for rich and poor alike, or where slum households comprise a significantly large majority of households in the city.

In the analysis of slum areas, UN-HABITAT defines any specific place, whether a whole city or a neighbourhood, as a slum area if half or more of all households lack improved water, improved sanitation, sufficient living area, durable housing, secure tenure, or combinations thereof. An area or neighbourhood deprived of improved sanitation alone may experience a lesser degree of deprivation than an area that lacks any adequate services at all, but both are considered slums in this definition. Understanding the spatial components of shelter deprivation and the dynamics of slum development

within cities is fundamental to improving the lives of slum dwellers and building urban harmony.

Slums in many cities are no longer just marginalized neighbourhoods housing a relatively small proportion of the urban population: in some cities, particularly in Southern Asia and sub-Saharan Africa, slums are home to significantly large proportions of the urban population and slum growth is as high as urban growth. The increasing prevalence – and even dominance – of poor-quality, underserved housing calls for new ways of looking at cities and the slums within them.

Slum households with the most shelter deprivations are highly visible in most African cities, as many are clustered within geographically contiguous high-density neighbourhoods, either in the centre or on the periphery of cities. In general, if a neighbourhood reflects slum characteristics, so do most of the individual households within that neighbourhood. Variations in the geographic distribution of slums tend to correspond at the highest level with a three-part typology: countries in which both poor families and rich families live in slum areas and non-slum urban areas are virtually absent; countries in which slum areas are distinct settlements only in capital and large cities; and countries in which non-slum areas are predominant and are home to both high- and low-income families.

Methodology

This section focuses on analyzing the geographical prevalence of slums and shelter deprivations according to city size. It is based on data from 49 countries in Africa, Asia and Latin America collected through Demographic and Health Surveys (DHS). DHS collects information on various aspects of housing as well as the place of residence: capital city, large city, small city, town, or village. It is important to note that the DHS definition of city size does not follow the criteria used in Part 1 of this report, but uses instead city sizes determined by the national implementing agency within each country. A city may be considered large at the country level but small at the international level according to its population size. The DHS data analysis reveals four types of variation of slum concentration by city size, each of which is detailed in the following text:

- Slum incidence is very high in small cities and towns, as well as in the capital and large cities (in 11 countries, 22 per cent)
- Slum incidence is high in small cities and towns but relatively low in the capital and large cities (in 17 countries, 35 per cent)
- Slum incidence is relatively low in the capital and large cities, as well as in small cities and towns (in 17 countries, 35 per cent)
- Slum incidence is higher in capital and large cities than in small cities and towns (in 4 countries, 8 per cent)

Locating slums: Geographic concentration and clustering



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"Tin city" Kibera, Kenya
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The number of slum dwellers in any given city can be discerned from data that enumerates general housing types and characteristics, but to efficiently implement programmes to deliver water, sanitation and durable housing, slum dwellers and shelter deprivations must be associated with specific geographic locations. Doing so can be a challenge, especially when census data and household surveys only distinguish urban from rural households, failing to disaggregate different types and sizes of urban areas.

Some countries have tried to differentiate urban slum and urban non-slum settlements using their own administrative definitions or through income-based indicators, such as poverty levels. This technique has a tendency to underestimate the slum population, as definitions and data collection are not always consistent and accurate. With the development of satellite imagery and geographic information systems, slums can be more easily identified and incorporated to censuses and surveys, but this approach is not yet fully implemented to allow global measurement and comparison of slums.

A different approach is to align the definitions of slum areas or neighbourhoods with census enumeration areas – small areas comprising one or more city blocks, typically canvassed by one census representative. Enumeration areas represent the smallest household aggregation in many countries' census methodologies;

population and housing characteristics within one enumeration area tend to be relatively homogeneous, making them powerful tools for localizing slums.

Slum enumeration areas take as their basis the concentration of slum households, initially disregarding the specific degree of deprivation experienced by households in the area. Recognizing that the threshold of slum household concentration for a slum enumeration area may vary from country to country according to cultural, economic and political factors, UN-HABITAT has opted for a threshold of 50 per cent: a neighbourhood is classified as a slum if more than half of the households in the area suffer from one or more shelter deprivation. (For cities in the developed world, however, the threshold may be lower, while for cities in the developing world, the threshold may be higher.)

Some limitations are inherent in the household concentration method used here: it does not uniformly consider characteristics specific to the settlement, such as the condition of the roads, availability of drainage systems, management of solid waste, and the like, nor does it consider whether the settlement is near a steep slope or in or near a flood plain, toxic waste area, industrial area, or other hazardous site. However, where such environmental information has been collected through Urban Inequities Surveys, preliminary results show that households with multiple

shelter deprivations are more likely to be located in neighbourhoods with poor road conditions, open drains or other inadequate drainage systems, poor management of solid waste, and where air and water pollution are prevalent. Where land and building materials are expensive, low-income families tend to use cheap materials and build fewer rooms to accommodate their households, resulting in lack of durability and overcrowding.

Slums are often viewed as the result of poor population growth management on the part of major cities, but cities of all sizes struggle with the inability to provide adequate affordable housing and the extended water supplies and sanitation facilities needed to serve growing populations. Slums can be easier to improve in small cities than in large cities, as small cities often present fewer social, cultural and economic barriers to urban development. In small cities, developing master plans and engaging in urban planning processes with the participation of families and communities is often more straightforward than in large cities, and institutions can be more easily coordinated to carry out service implementation. In cities of all sizes, improving the lives of slum dwellers depends on the increased development of non-agriculture sectors, services and industries for sustainable urbanization, and creating access to well-paid jobs and formal housing policies with structured mortgage systems.

Countries with generalized slums: Slum incidence is very high in small cities and towns as well as in the capital and large cities

Generalized slums are prevalent throughout least-developed countries. In Africa, slum incidence is very high in both big and small cities of Burkina Faso, Central African Republic, Chad, Ethiopia, Malawi, Niger, Tanzania, and Togo. High slum incidence in all types of cities has also been recorded in Yemen; and Haiti. In each of these countries, poverty is endemic, with populations lacking basic services in shelter, health and social services across city types and sizes. Rapid urban growth without needed urban infrastructure development has resulted in a high proportion of slum households in capital and large cities – urbanization and urban growth have led to increased slum growth. In these countries, slum households are deprived of multiple basic shelter needs; nearly one-quarter of slum households suffer from one or two shelter deprivations, and almost half suffer from *at least* two shelter deprivations.

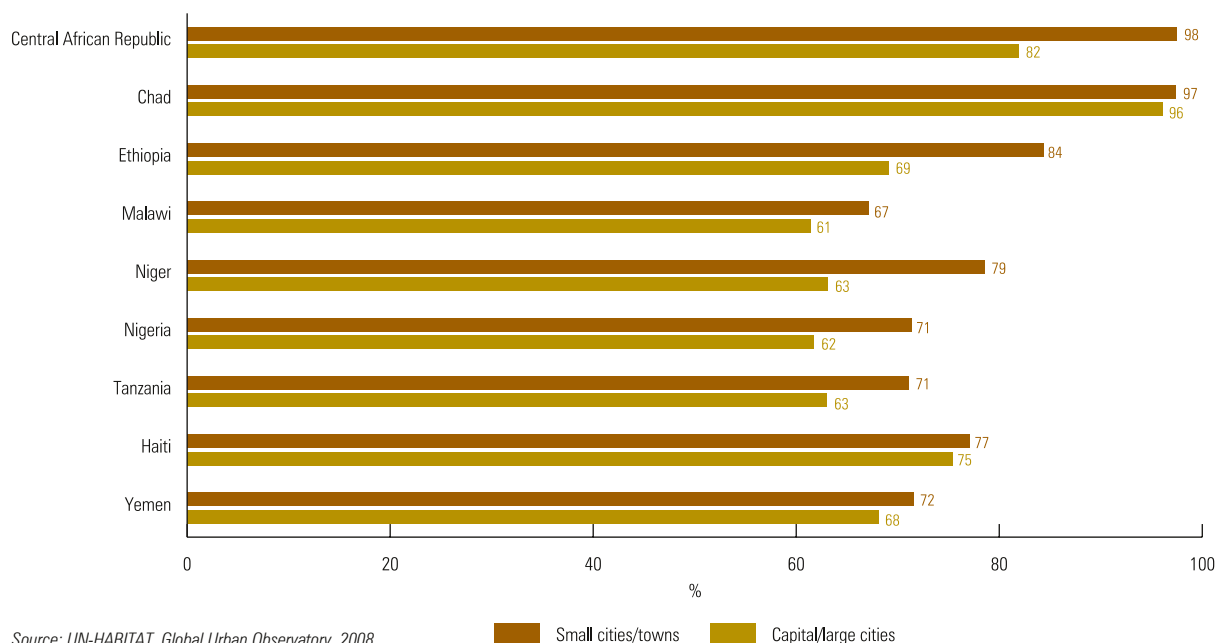
In the Central African Republic, the prevalence of slums is high in small cities and towns as well as in the capital of Bangui and other large cities, but it is important to note that the incidence of multiple deprivations is much higher in small cities and towns, where 82 per cent of households lack at least two basic services: 27 per cent lack both improved water and sanitation, and 27 per cent lack water, sanitation and durable housing. In the capital and large cities, the leading shelter deprivations are improved sanitation and durable housing; 16 per cent of households lack both. In Chad, while slums comprise 97 per cent of households in small cities and towns, and 96 per cent in the capital and large cities, shelter deprivations experienced by different cities vary. In the capital

of Ndjamena and other large cities, durable housing is the leading deprivation; 18 per cent of households lack durable housing and improved sanitation together, and 12 per cent lack both durable housing and sufficient living space. In small cities and towns, although durable housing is a concern, it is more often combined with other shelter deprivations than in large cities: 22 per cent of households lack durable housing and improved sanitation, and 16 per cent are without durable housing, improved sanitation and improved water combined, constituting an extremely severe deprivation. The situation is similar in Ethiopia and other countries with the same level of slum prevalence.

Countries with high slum prevalence in small cities and towns and relatively low slum prevalence in the capital and large cities

In countries with high rates of slum prevalence in small cities and towns and lower slum prevalence in the capital and large cities, families in small cities and towns typically bear the burden of multiple shelter deprivations. Some small cities and towns are administratively and politically created without basic urban planning systems, adequate shelter and basic infrastructure, while capital and large cities in the same country benefit from urban infrastructure and services. In Benin, for example, the slum prevalence in the capital city of Cotonou and other large cities is relatively low, at 20 per

FIGURE 2.5.1 A: PERCENTAGE OF SLUM HOUSEHOLDS BY SIZE OF CITY
COUNTRIES WITH HIGH CONCENTRATION OF SLUMS IN SMALL CITIES/TOWNS AS WELL AS IN CAPITAL/LARGE CITIES



Source: UN-HABITAT, Global Urban Observatory, 2008



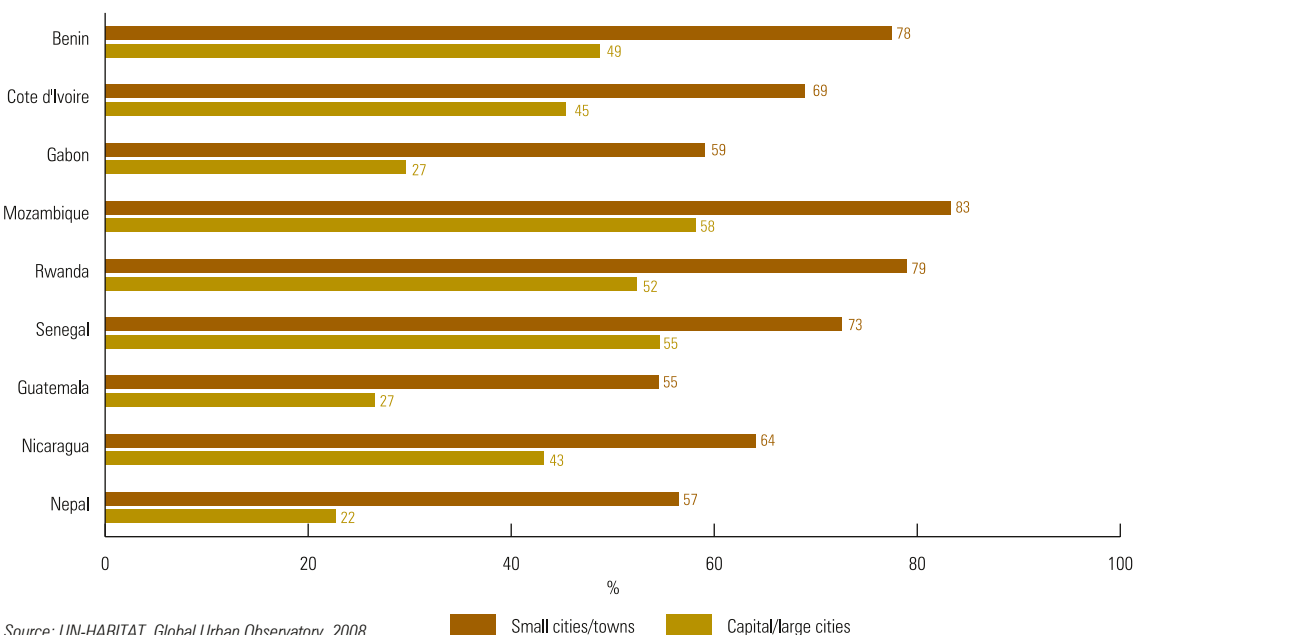
▲ Street market in Benin
©Peeter Viisimaa/iStockphoto

cent; in small cities, however, slums comprise the majority of households, at 74 per cent, more than three times the prevalence of slums in the capital and large cities. In Benin's small cities and towns, 29 per cent of slum households lack improved sanitation; 12 per cent lack both sanitation and improved water; 11 per cent lack both sanitation and durable housing; and 15 per cent go without sanitation, water or durable housing combined. In the capital and large cities, access to improved water, sufficient living area and durable housing is quasi-general; only 20 per cent of households lack improved sanitation, classifying them as slums.

A similar, but less dramatic, situation exists in Cote d'Ivoire: 59 per cent of households in small cities and towns are classified as slums; 25 per cent lack improved sanitation facilities, 13 per cent lack improved water, and 14 per cent go without either service. In the capital of Abidjan and large other cities, the slum prevalence is 32 per cent, but most of these households have only one shelter deprivation – improved sanitation.

The high prevalence of slum households in the small cities and towns of these countries can be attributed primarily to the lack of urban planning. Hence, while these settlements qualify as “cities” due to their population size, they do not provide the infrastructure and economic activities that make cities liveable and viable. In many countries, “cities” are actually urban agglomerations that encompass a contiguous territory inhabited at urban density levels, without regard to administrative boundaries. In other places, population size is all that matters for classification as a city, as in Mali and Madagascar, where any place with a population of 5,000 inhabitants qualifies as urban. In most of these places, rural activities are predominant, with the exception of some

FIGURE 2.5.1 B: PERCENTAGE OF SLUM HOUSEHOLDS BY SIZE OF CITY COUNTRIES WITH HIGH CONCENTRATION OF SLUMS IN SMALL CITIES/TOWNS AND LOW OR MODERATE CONCENTRATION OF SLUMS IN CAPITAL/LARGE CITIES



Source: UN-HABITAT, Global Urban Observatory, 2008

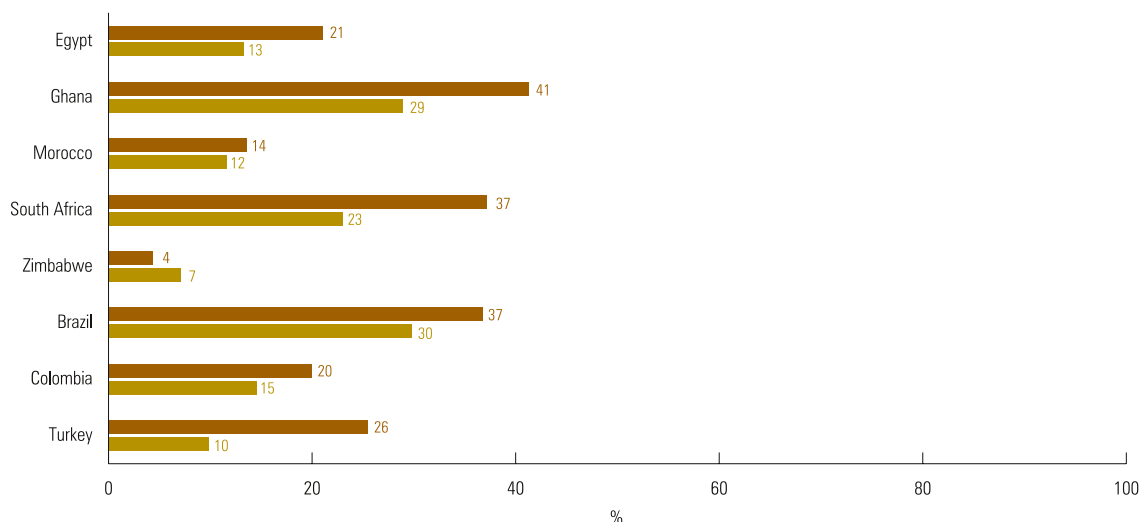
Countries with relatively low slum prevalence in capital and large cities, as well as in small cities and towns

administrative services. The reclassification of a location from rural area to city or town can imply the presence of administrative institutions, such as a city council that has the responsibility to develop a city plan, to distribute lands and provide basic services. Water and electricity provision are the primary services that follow such a reclassification. However, development of sewerage systems and a housing scheme to ensure access to adequate dwellings often do not follow, leaving small cities and towns *de facto* villages or rural communities.

Creating “urban” places without adequate urban infrastructure is a recipe for slum cities. Newly provided improved water attracts migrants from neighbouring villages, while the lack of improved sanitation and durable housing remain issues for everyone, including natives and new migrants. In these small cities and towns, the most common improved water supply is from a public tap or borehole; households are rarely connected to piped water. There are no sewerage systems and the management of solid waste is often infrequent or nonexistent. In the capital and large cities of countries where small cities and towns have the highest prevalence of slums, most families have access to improved water and improved sanitation. There, lack of durable housing and sufficient living area are the primary shelter deprivations, reflecting a poor housing market that prevents the attainment of enough equity to make house repairs and extensions. Mortgage markets and other housing finance mechanisms are poor or nonexistent, preventing many residents from accessing affordable houses.

In countries with low prevalence of slums in both large and small cities, multiple shelter deprivations are rare. In Egypt, for example, slum households in the capital Cairo and other large cities, as well as in small cities and towns, tend to lack improved sanitation only. Only 13 per cent of households in the capital, and 21 per cent in small cities, experience shelter deprivations. In Brazil and Colombia, lack of sufficient living area is the main shelter deprivation in the capital and other large cities, while lack of improved sanitation is the leading shelter issue in small cities and towns. Data from the Dominican Republic and Honduras indicate similar conditions, with overcrowding dominating shelter deprivations in large cities and lack of improved sanitation comprising the main shelter issue in small cities. In parts of Asia, too, overall slum prevalence is generally low, with most slum households experiencing only one shelter deprivation. In Turkey and Krygyzstan, for instance, the leading shelter deprivations in small cities and towns are similar to those observed in the capital and large cities. In Turkey, where the prevalence of slums is 10 per cent in the capital city of Ankara and other large cities and 25 per cent in small cities, lack of improved water and sufficient living area are the primary shelter deprivations. In Krygyzstan, where prevalence of slums is 19 per cent in the capital and large cities and 39 per cent in small cities and towns, lack of improved sanitation is the leading shelter deprivation factor: 28 per cent of large city households and 14 per cent of small city households lack improved sanitation. South Africa has a similar pattern: multiple shelter deprivations are significant only in small

FIGURE 2.5.1 C: PERCENTAGE OF SLUM HOUSEHOLDS BY CITY SIZE
COUNTRIES WITH LOW OR MODERATE CONCENTRATION OF SLUMS IN CAPITAL/LARGE CITIES AS WELL AS IN SMALL CITIES AND TOWNS



Source: UN-HABITAT, Global Urban Observatory, 2008

■ Small cities/towns ■ Capital/large cities



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A slum settlement in Brazil.
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cities and towns, with 10 per cent of households experiencing multiple deprivations, compared with a total slum prevalence of 37 per cent. In the capital city of Pretoria and other large cities, one shelter deprivation is more common: 7 per cent of households lack improved sanitation and 8 per cent lack sufficient living area, where the overall slum prevalence is 23 per cent.

The countries with relatively low slum prevalence across different types and sizes of cities seem to have anticipated needs for basic infrastructure as they grew. In most of these cities, a vast majority of slum households suffer from only one shelter deprivation. Simple, low-cost interventions are all that are needed to help most of these countries to create “cities without slums”.

Slum incidence is higher in capital and large cities than in small cities and towns

The prevalence of slums is greater in large cities than in small ones in only four countries in this analysis: Namibia, Bolivia, Bangladesh, and the Philippines.

Namibia is among the few African countries with only a moderate prevalence of slums, at 34 per cent of all households, compared with 66 per cent in the sub-Saharan African region as a whole. Contrary to the general trend, however, slum households in the country are slightly more prevalent in the capital and its large cities (36 per cent) than in its small cities (33 per cent). Clearly, Namibia has taken steps to provide adequate housing for its urban residents, but small cities and towns appear to be providing housing that meets the needs of their residents better than the capital and other large cities. Use of improved water is quasi-universal throughout the country, however sufficient living space is lacking in the capital and other large cities.

Overcrowding typically correlates with urban growth in the absence of adequate housing supplies to satisfy demand generated by additional households. The governments of many capital cities have responded to urban growth by reducing the amount of land available to each household, leading to inflation in the housing market. Land prices have skyrocketed over the last several years in many African cities, where a black market in real estate has also developed to meet demand. The cost of building materials has not followed the inflation in the land market and the market in general, allowing families to afford building materials, but not enough land to provide a home of suitable size for their households.

Many residents of Namibia’s cities are also deprived of adequate sanitation facilities, particularly in the capital and other large cities, where 76 per cent of households have access to improved sanitation, compared with 80 per cent in small cities and towns. The gap in sanitation coverage between large and small cities has grown in recent years: from 1992 to 2000, the prevalence of slums in the capital and other large cities grew from 24 per cent to 36 per cent, owing primarily to deterioration in improved sanitation coverage, while slums decreased from 39 per cent to 32 per cent in small cities and towns.

Bolivia is among the countries in Latin America and the Caribbean with a high general prevalence of slum households, particularly in the capital and other large cities, where 60 per cent of households are slums, compared with 47 per cent in small cities and towns. Households in Bolivia’s small cities and towns have fewer overall shelter deprivations than those in the capital and large cities. This is especially the case concerning access to improved sanitation and access to durable housing: in small cities, 74.2 per cent have access to sanitation, compared with 62.3 per cent in large cities; and 89.4 per cent of households in small cities have durable housing, versus



▲ Overcrowded house, Phnom Penh
©Keisuke Ikeda

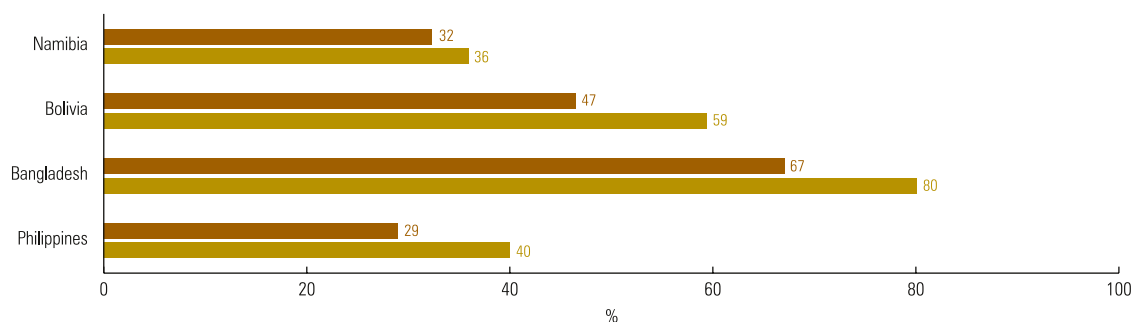
78.3 per cent in large cities. Bolivia's large cities have clearly grown in the absence of sufficient basic shelter services – a longitudinal perspective shows that they once had adequate infrastructure for their populations, but they have not been able to keep up with population growth.

Bangladesh, like several Asian countries, has a high general prevalence of slum households, but unlike many others, slum prevalence in its capital Dhaka and other large cities is higher than in its small cities and towns. In Bangladesh's large cities, 79 per cent of households are classified as slums, compared with 67 per cent in small cities and towns. While access to improved water is quasi-universal and availability of sufficient living area is roughly the same in cities of different sizes, people who live in small cities and towns have better access to improved

sanitation than those in the capital and large cities: 72 per cent of households in small cities have improved sanitation, versus 66.5 per cent in large cities. This is also the case with durable housing, available to 48.6 per cent of households in small cities, compared with 33.8 per cent in large cities.

The Philippines has a moderate prevalence of slum households compared with the rest of Asia, with 37.8 per cent of households in the capital and large cities classified as slums, compared with 29.1 per cent in small cities. In small cities, 94.6 per cent of households have access to improved sanitation and 74.1 per cent have access to durable housing, while in large cities, 87 per cent of households have access to improved sanitation and 71.6 per cent have access to durable housing.

FIGURE 2.5.1 D: PERCENTAGE OF SLUM HOUSEHOLDS BY SIZE OF CITY
COUNTRIES WITH SLUM CONCENTRATION HIGHER IN CAPITAL/LARGE CITIES THAN IN SMALL CITIES AND TOWNS



Source: UN-HABITAT, Global Urban Observatory, 2008

■ Small cities/towns ■ Capital/large cities

Clustering of slum dwellers within cities

Type 1: Countries with high overall slum prevalence, giving rise to “slum cities”

Where the prevalence of slums is dramatically high in both large and small cities, they become the common form of human settlement, with both poor and rich households lacking at least one element of adequate shelter or where households that have adequate shelter are located in areas that are generally deprived. Most such cities are in countries in which poverty is endemic, urban infrastructure is absent, and housing is inadequate overall. In such “slum cities”, the wealthy are able to access improved water and sanitation in durable houses with sufficient living space, but these households comprise a very small proportion of the population, and they are typically subject to the same larger environmental conditions from which the city suffers: lack of solid waste management, excessive pollution and other hazards.

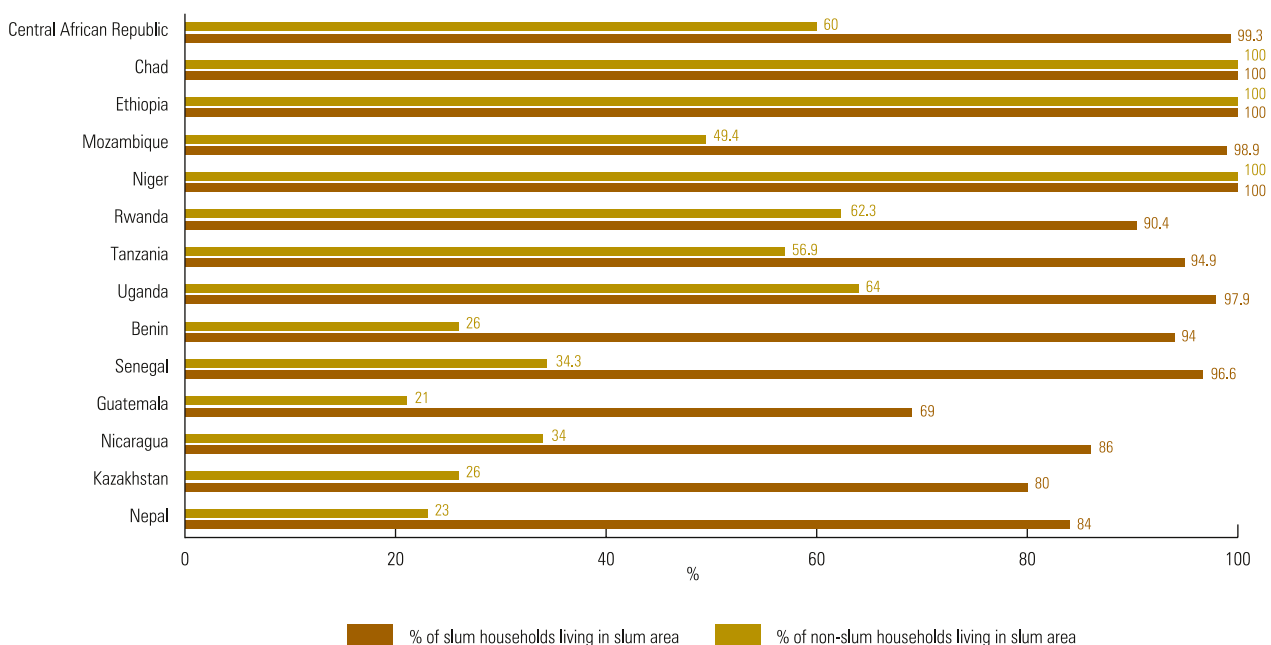
Slum cities are prevalent throughout sub-Saharan Africa, where poor households experience multiple shelter deprivations. In Burkina Faso, for example, 93 per cent of slum households live in a concentrated slum area, with 71 per cent living in an extremely deprived area in which three out of four households lack basic shelter services. Even 65 per cent of households that do not have any shelter deprivations – non-slum households – live in a slum area, while 35 per cent of non-slum households live in a mildly deprived area. In total, 87 per cent of all households live in a slum area – more

than the total proportion of slum households, which is 79 per cent.

In the Central African Republic, Chad and Ethiopia, slum cities are more entrenched and underserved, with as much as 91 per cent of even non-slum households living in extremely deprived settlements. Estimations of slum prevalence in Central African Republic, Chad and Ethiopia are the same at both the household and area level of analysis, meaning that they are characterized by slum cities in which rich and poor families live alongside each other. The same situation prevails in Niger, Nigeria, Tanzania, and Togo. The lack of basic services in slum cities cannot be attributed only to the informality of the settlements – indeed, entire cities cannot comprise “informal” settlements – but are rather an outgrowth of inadequate planning, construction and social services. Where governments have not provided adequate urban infrastructure, cities may become more and more deeply mired in the pollution, disease and social ills emanating from underserved areas.

In countries where the urban landscape is dominated by slums, improvement in the lives of slum dwellers first requires the implementation of macro-level programmes, including housing infrastructure and finance, improved water, improved sanitation, and durable housing units with adequate living space. However, macro-level programmes must be associated with micro-level programmes, including micro-financing, self-help, education, and employment. Housing services may exist, but families will use them only if they are affordable.

FIGURE 2.5.2: PERCENTAGE OF NON-SLUM OR SLUM HOUSEHOLDS LIVING IN SLUM AREAS



Source: UN-HABITAT, Global Urban Observatory, 2008

Moreover, urban infrastructure focused on upgrading slums should incorporate economic development and employment programmes to enable families to afford public services for their dwellings. Efforts must also ensure that durable, properly sized housing is affordable and accessible to poor families so that they can also afford health care, education and other needs.

Type 2: Countries in which slum areas are highly visible and concentrated settlements in capital and large cities: The isolated underclass

The second category of countries are those where the prevalence of slums is dramatically high in small cities and towns compared with the capital and other large cities. In these countries, there is a clear distinction between slum areas and non-slum areas, particularly in the capital and large cities, while small cities and towns are dominated by slum areas. For example, in the capital and large cities of Benin, 94 per cent of slum households live in slum areas, while 74 per cent of non-slum households live in non-slum areas. Only 26 per cent of non-slum households co-reside with slum households in slum settlements, while only 6 per cent of slum households live in non-slum settlements. Côte d'Ivoire has the same prevalence of slum households as Benin, at 65 per cent, but in the large cities of Côte D'Ivoire, a significant proportion of non-slum households live in slum areas (44 per cent), while 12 per cent of slum households live in non-slum areas. In fact, 73 per cent of households, slum or not, live in non-slum areas. In Guinea and Madagascar, where the urbanization process is led by small cities and towns, large proportions of non-slum households live in slum areas. Rwanda and Uganda offer a different scenario, in which the majority of non-slum households live in non-slum areas.

Also in this second group are cities in the Latin American countries of Guatemala, Nicaragua and Peru. In Guatemala, there is a net distinction between slum areas and non-slum areas in the capital and large cities, with non-slum areas hosting primarily non-slum households, and slum areas hosting primarily slum households: only 31 per cent of the residents of non-slum areas are slum households, and only 21 per cent of the residents of slum areas are non-slum households. In Nicaragua, 34 per cent of the residents of slum areas are non-slum households, while 14 per cent of the residents of non-slum areas are slum households. In Peru, the percentages are 14 per cent and 29 per cent, respectively.

This category also includes cities in the Asian countries of Kazakhstan, Nepal and Pakistan. In Kazakhstan, 26 per cent of non-slum households live in slum areas, while 20 per cent of slum households live in non-slum areas. In Nepal, the proportions are 23 per cent and 16 per cent, respectively. In Pakistan, a large proportion of non-slum households live in non-slum areas, with the vast majority of slum households, 90 per cent, living in slum areas.

Type 3: Countries with generally low or moderate slum prevalence: Poverty at the margins

The third group of countries includes those with low or moderate slum prevalence in capital and other large cities, as well as in small cities and towns. In these countries, a large proportion of slum households live in non-slum areas, while almost all non-slum households reside in non-slum areas. In the UN-HABITAT definition, a slum area is a place in which half or more households experience at least one shelter deprivation; the countries in this third category tend to have few slum areas, or slum areas with very small proportions of non-slum households. For example, Ghana has a slum prevalence of 47 per cent, and 31 per cent of its slum households live in slum areas. Overall, slum areas in Ghana host 45 per cent of all urban households. In South Africa, only 5 per cent of non-slum households reside in slum areas, while 30 per cent of slum households reside in non-slum areas. Slum areas in South Africa are home to a smaller percentage of the country's households, 25 per cent, than the overall percentage of slum households, 31 per cent.

A similar situation exists in Brazil, where 13 per cent of non-slum households live in slum areas, and 34 per cent of slum households reside in non-slum areas. Here also, the proportion of households living in slum areas is lower than the total proportion of slum households in the country. In Colombia, only 3 per cent of slum households live in slum areas, while the majority of slum households (60 per cent) live in non-slum areas. Slum areas in Colombia are home to only 10 per cent of the country's slum households – significantly less than the 19 per cent of slum households. In the Dominican Republic, 3 per cent of non-slum households live in slum areas, while 82 per cent of slum households live in non-slum areas. Slum areas are home to only

In cities of countries with moderate overall prevalence of slums, slum households tend to cluster together, as do non-slum households

6 per cent of households there, a third of the proportion of slum households in the country (20 per cent). India offers a different picture, with 31 per cent of non-slum households living in slum areas, while 40 per cent of slum households reside in non-slum areas. Overall, 45 per cent of households live in slum areas, a level similar to the proportion of slum households in the country (49 per cent). In Indonesia, 25 per cent of non-slum households live in slum areas, while 26 per cent of slum households live in non-slum areas. The proportion of households living in slum areas (50 per cent) is similar to the proportion of slum households in the country. In Armenia, 15 per cent of non-slum households live in slum areas, while 21 per cent of slum households live in non-slum areas. Slum areas are home to 39 per cent of the households, a level identical to the proportion of slum households. In Turkey, 16 per cent of non-slum households live in slum areas, while 43 per cent of slum households live in non-slum areas.

In cities of countries with moderate overall prevalence of slums, slum households tend to cluster together, as do



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Bogota night lights.
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non-slum households. These cities have adequate urban infrastructure in many places, supporting those residents who can afford housing costs that include access to improved water and sanitation, and durable housing units with sufficient living area. In such places, the urban infrastructure is not yet sufficient to satisfy the needs of all families and provide universal access to adequate shelter. Families must make tradeoffs regarding their access to different amenities in their search for affordable housing; many opt for slum housing that lacks essential services because it is all they can afford or because it is closer to a workplace. This situation is prevalent in several countries in sub-Saharan Africa (Benin, Côte d'Ivoire, Kenya, Malawi, Mali, Senegal, Zambia, and Gabon); Latin America and the Caribbean (Bolivia, Guatemala, Haiti, Nicaragua, and Peru); and Asia (India, Indonesia, Nepal, Viet Nam, and Armenia). A significant number of slum households in these countries also live in non-slum areas, indicating that entrenched poverty is a major factor in the persistence of moderate slum prevalence.

Summary

Clearly, not all poor urban households are clustered in underserved slum areas; they can be located anywhere in cities and still lack one or more elements of adequate shelter. The lack of basic services in cities has various social and economic dimensions that are related to the physical structure of the environments in which people live as well as to the socio-economic conditions of families. Conversely, not all those who live in slums are poor – many people who have risen out of income poverty choose to continue living in slums for various reasons, ranging from the lack of affordable housing in better parts of the city to proximity to family, work and social networks. No single generalization fits slum neighbourhoods; they are as diverse as cities themselves. However, it is clear that expanding urban infrastructure to underserved or informal settlements is essential for improving the lives of slum dwellers.

The capital and large cities of the second group are becoming more and more spatially divided, with high- and

middle-income households living in better-serviced parts of the city, and poor households living in spatially and socially segregated zones in inadequate housing, with few or no basic services. Although the presence of slums does not directly denote levels of urban poverty, their prevalence in a city is an indicator of urban inequality.

Ghana and South Africa offer another type of city, in which most slum households are individual dwellings in different neighbourhoods; some also exist within serviced, middle- and high-income areas. In these countries, non-slum areas are dominant, with slum areas concentrating a small proportion of households. Where housing is more integrated, shelter deprivations are less pronounced than in countries with slum

cities – densely inhabited areas in which most households experience multiple shelter deprivations.

Cities in Egypt, Morocco, Colombia, and the Dominican Republic have urban settings in which slum areas, as defined here, host only a small proportion of households. Households classified as slum households are instead located in non-slum areas where the majority of residents enjoy basic shelter services. In most cases, households have access to improved water and improved sanitation; other shelter deprivations are linked to household poverty, which impacts the ability to afford durable housing and sufficient living area. For these families, increased economic opportunities could play a significant role in improving their living conditions.



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Agadir, Morocco
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Years of Sanctions and Conflict Take Their Toll on Iraq's Cities

Ancient Mesopotamia, or modern-day Iraq, is the birthplace of many ancient cities and civilizations. It was here that the ancient kingdom of Sumer developed more than 7,000 years ago and where the alphabet and arithmetic were invented. The ancient cities of Iraq were centres of political power locally and across borders, sometimes encompassing most of the Middle East, stretching to the Mediterranean Sea.

Today, the country, once self-sufficient in agriculture and possessing a well-educated and skilled population and huge oil wealth, has gone from being one of the most promising countries in the Middle East to one whose human development indicators are among the lowest in the region. Several years of UN sanctions and the more recent war and internal conflicts have left several cities with significant infrastructure and housing challenges. The sanctions period in the 1990s led to a general decline in infrastructure and services in cities, notably power stations, sewage plants and water works. Maternal mortality rates have increased from 117 per 100,000 live births in 1991 to 294 per 100,000 live births in 1999 as the number of hospitals declined from 234 in 1987 to 212 in 2000. Secondary school enrolment fell from 47 per cent to 38 per cent in the same period.

Nearly 70 per cent of Iraq's 29 million people live in cities, with some 5.6 million people living in the capital city of Baghdad. Urban neighbourhoods in Iraq vary from old-style traditional residential areas to serviced sub-divisions with detached houses to squatter settlements. Military action since 2003 has led to damage of dwellings in major cities, although some cities, such as Najaf, have been more deeply affected than others. The Iraq Living Conditions Survey 2004 found that while nearly 10 per cent of homes in Najaf were damaged due to military action, the proportion was much lower in cities such as Baghdad and Mosul, where slightly more than 5 per cent of dwellings were damaged. However, in almost all cases, households were left to their own devices when it came to repairing damaged houses.

Sanctions in the 1990s, poor governance, mismanagement and conflict have led to a general deterioration of living conditions in cities. Poor quality housing and slums are found in decaying historic inner-city areas and in public buildings and spaces that have been claimed by squatters. UN-HABITAT estimates indicate that 53 per cent of Iraq's urban population currently lives in slum conditions, with overcrowding becoming more prevalent. Iraq's cities also face major infrastructure challenges: urban residents view the lack of



▲ Street in Baghdad
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sewers as the most pressing infrastructure problem, followed by lack of electricity and unpaved streets. Urban households experience inadequate access to water and sanitation, disrupted solid waste management services and frequent flooding, all of which are potential health hazards. Almost half of all urban households in Iraq experience problems with water supply at least once a week, with Baghdad being among the worst affected cities. In 2003, Care International reported that 60 per cent of Iraq's water treatment and sewage plants were not functioning. In Basra, for instance, only 11 per cent of the city's area has sewer connections. Almost all households in urban Iraq are connected to the electricity network, but major power cuts remain a perennial problem. In 2006, for example, Baghdad and Najaf experienced power cuts approximately 120 hours per week, while Mosul has power less than 10 per cent of the time.

Despite an upturn in economic indicators that show a doubling of gross domestic product (GDP) from \$15 billion in 2003 to \$32.3 billion in 2005, Iraqis remain reliant on social assistance, rations and subsidies. The pre-2003 political regime used urban social goods and opportunities as a way of bestowing or withholding patronage, resulting in exclusion of a large proportion of the urban population from the benefits of urban life. An estimated 35 per cent of Baghdad's working population still lives in poverty. Some households are particularly

vulnerable to poverty, including those headed by women or youth.

Iraq's future remains uncertain. A recent survey shows that the country's urban population is deeply concerned with the security situation, which has worsened in the last five years. Perceived or real levels of vulnerability to violence and murder were greater in 2006 than they were in 2002. In 2004, some 90 per cent of households in Baghdad and Mosul heard shooting in their neighbourhoods several times a week. This has created a general sense of fear, prompting parents to constantly worry about whether their children will reach home safely after school. In 2006, Iraq's cities were considered among the most dangerous in the world, with Baghdad being the most unsafe. Internal conflict and sectarian violence since the 2003 war have resulted in several thousand deaths; in July 2006, for instance, 6,000 people were killed in Baghdad alone.

Extremely high levels of violence within Iraq's cities have greatly impacted migration patterns and increased household sizes as people move from one city to the other seeking refuge. It is estimated that as many as 4 million Iraqis have fled the country and more than 1 million are internally displaced. Violent internal conflict has shifted focus from urgent development priorities and has threatened to make the task of rehabilitation and reconstruction long and protracted.

Sources: Republic of Iraq/UN-HABITAT, 2007 and UN-HABITAT Global Urban Observatory, 2008, and other sources.

Helping to locate slums using Earth Observation and Geoinformation Technologies



▲ Satellite image of dense slum settlements bordering green spaces and high-income residential areas in Nairobi. ©Digital Globe, Google Earth, 2008

Civilian Earth Observation and geoinformation technologies can provide complementary information to field surveys that aim to characterize and identify slums. Satellite-based remote sensing provides synoptic overviews over settlements and cities and thus an opportunity to locate slum areas. This can prove to be useful when improving census and field surveys. The satellite images can also provide a description and identification of the physical structure of housing and housing patterns, which may be indicators for slum conditions. These Earth Observation-based measures need always to be confirmed with field information.

Earth Observation can contribute to measuring the durable housing criterion – one of the indicators used to define slum households. The durable housing criterion states that houses should be built in a non-hazardous location, have a permanent structure and are adequate enough to pro-

tect its inhabitants from the extremes of climatic conditions such as rain, heat, cold and humidity. EO contributes to identifying hazardous areas (e.g. unstable slopes, flood plains, industrial zones or railroads) and to characterizing roofing materials (e.g. corrugated iron, plastic sheeting). Earth Observation also provides information on the road network (planned-haphazard, paved-unpaved), building types (number of floors, size) and built-up density (open spaces).

The image shows indicators that could be used to characterize slum and non-slum areas. Slums are often recognized through satellite imagery as they often show dwellings of a smaller size than non-slum dwellings. The estimation of the average size of built-up structures – measured as the diameter of the building surface, or as the surface of the roofs visible in the remotely sensed data – can be quantified through an image decomposition based

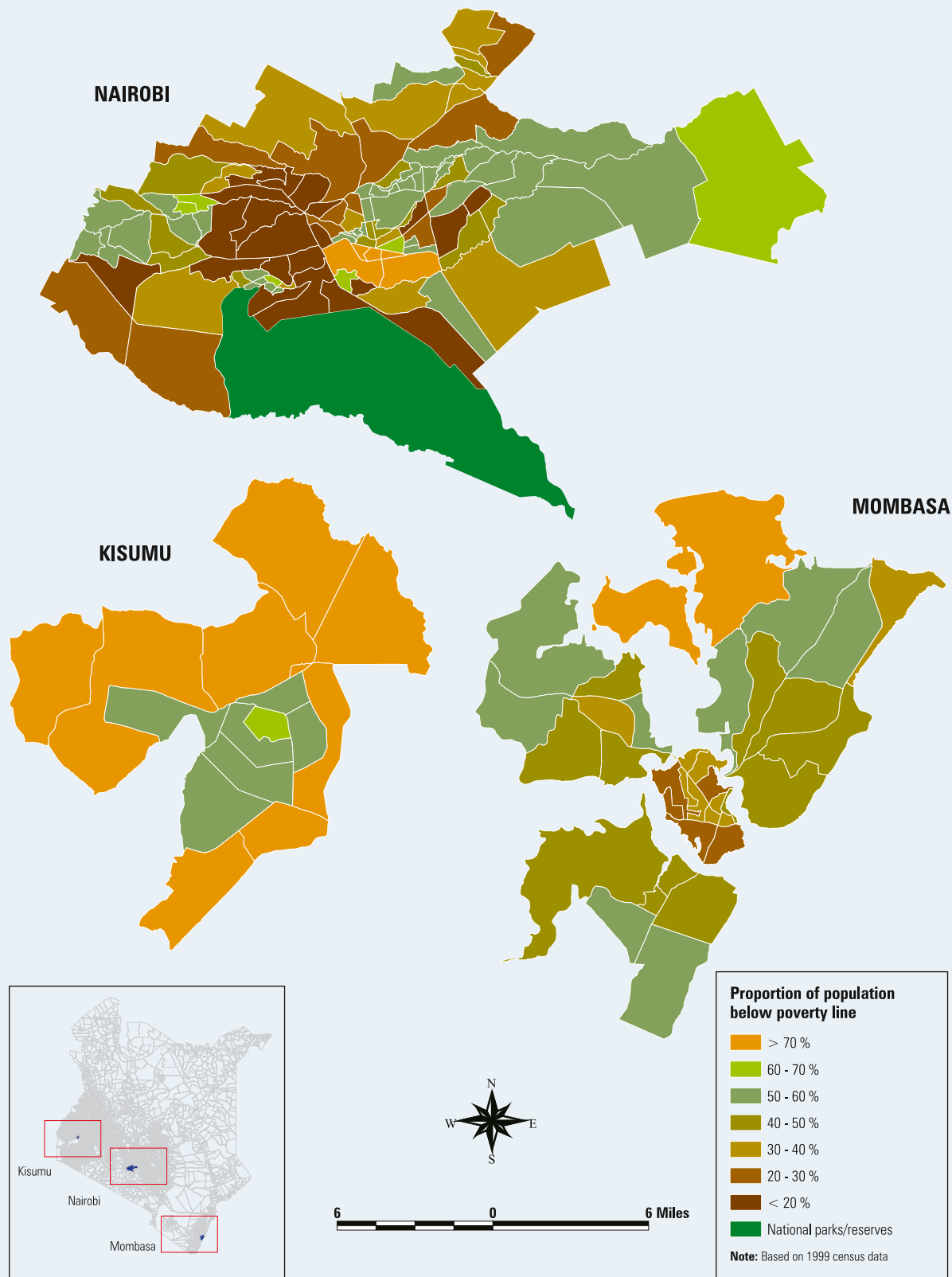
on morphological transformations with increasing size, the so-called derivative of the morphological profile (DMP). Satellite images of settlement patterns in Nairobi, Kenya, clearly show a highly dense slum settlement within a wealthy less dense neighbourhood (see image above).

The presence of vegetation in the case of Nairobi can often be associated with the quality of the settlement or neighbourhood. Slums have little vegetation, while more wealthy residential areas show evident presence of green areas. The presence of vegetation can be calculated using a vegetation index, e.g. the normalized difference vegetation index (NDVI). Often only a combination of indicators is needed to differentiate slum and non-slum areas.

Some countries are also using “poverty maps” to identify low-income neighbourhoods, as the maps of three cities in Kenya show. (Fig. 2.5.3)

Source: Joint Research Commission of the European Union, 2008.

FIGURE 2.5.3: POVERTY INCIDENCE IN NAIROBI, MOMBASA AND KISUMU, 1999



Poverty maps like the ones of the three Kenyan cities above can be useful in identifying where slums are likely to be concentrated: The maps show that while the capital city Nairobi exhibits both low and high levels of poverty, poverty in the lakeside city of Kisumu tends to be generalized with large proportions of the city's population living below the poverty line. The coastal town of Mombasa, on the other hand, has a relatively prosperous inner core surrounded by areas experiencing high levels of poverty.

Source: Government of Kenya, Central Bureau of Statistics, 2003.