

Chapter 1

Crowded with people, not dense with capital

Urbanization benefits people and businesses by increasing economic density. A worker in an economically dense area can commute more easily and consume a broader range of products. Firms clustered in cities can access a wider market of inputs and buyers. Scale economies reduce firms' production costs — in turn benefiting consumers.



Population density is indeed strongly correlated with indicators of livability — in Sub-Saharan Africa as elsewhere (Gollin, Kirchberger, and Lagakos 2016). Yet Africa's cities are not economically dense or efficient. They are crowded and unlivable. Most urban residents are packed into low-rise, informal settlements without adequate infrastructure or access to basic services. Two of every three people in Lagos, Nigeria dwell in slums (World Bank 2015b). Thus, even though households in densely populated areas of Africa are better supplied with services than rural households, the mere fact of higher population density does not imply a livable environment.

Why do a majority of people in Africa's cities live in slums? The immediate explanation is that the urbanization of people has not been accompanied by the urbanization of capital. Housing, infrastructure,

and other capital investments are lacking, especially outside the city center. Urban building stocks have low replacement values. Across Africa, housing investment lags urbanization by nine years (Dasgupta, Lall, and Lozano-Gracia 2014).

The population density of African cities is similar to that of many cities elsewhere. What is holding these cities back is their low economic density — the lack of thriving urban markets that depend on adequate infrastructure and conveniently connected clusters of residential and commercial structures. A dearth of capital and capital investment keeps Africa's cities inefficient and less productive than they should be, limiting firms and workers to the production of goods and services for small and local hinterland markets locking them out of much more lucrative regional and international markets.

Crowded with people

Many of Africa's urban workers live in crowded quarters near the city center. In Dar es Salaam, Tanzania, 28 percent of residents are living at least three to a room (World Bank 2015c); in Abidjan, Côte d'Ivoire, the figure is 50 percent (World Bank 2016).

The reason for this crowding is that most people must live near the downtown district or industrial zones if they hope to work. They cannot conveniently commute from outlying areas, because little or no affordable transportation is available.

Africa's cities also suffer from a lack of adequate formal housing around the urban core. Consequently, people settle in relatively central informal settlements that are densely populated, ill served by urban infrastructure, and, by many measures, unlivable. Paradoxically, Africa's cities are sparsely built and laid out but feel crowded.

Slums: Workers' only option when urban economic density is low but highly concentrated

The crowdedness of African cities is most apparent in their slums. On average, 60 percent of Africa's urban population is packed into slums — a far larger share than the average 34 percent seen in other developing countries (United Nations 2015).

During 1960–72, Sub-Saharan Africa and Latin America had similar incidences of slums and squatter settlements (table 1.1). More recently, slum levels in Sub-Saharan Africa (62 percent) and Latin America (24 percent) diverged. South Asia's levels (35 percent) are similar to its historical levels, although some cities have experienced large increases in slum proportions.

Table 1.1 Slum population as percentage of total urban population in selected cities, historically and in 2014

Region/country	City	Share of city population living in slums	Share of national population living in slums in 2014
Sub-Saharan Africa			
Cameroon	Douala	80 (1970)	37.8
	Yaoundé	90 (1970)	
Côte d'Ivoire	Abidjan	60 (1964)	56.0
Ethiopia	Addis Ababa	90 (1970)	73.9
Ghana	Accra	53 (1968)	37.9
Kenya	Nairobi	33 (1970)	56.0
	Mombasa	66 (1970)	



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Region/country	City	Share of city population living in slums	Share of national population living in slums in 2014
Liberia	Monrovia	50 (1970)	65.7
Madagascar	Tananarive	33 (1969)	77.2
Malawi	Blantyre	56 (1966)	66.7
Nigeria	Ibadan	75 (1971)	50.2
Senegal	Dakar	60 (1971)	39.4
Somalia	Mogadishu	77 (1967)	73.6
Sudan	Port Sudan	55 (1971)	91.6
Tanzania	Dar es Salaam	50 (1970)	50.7
Togo	Lomé	75 (1970)	51.2
Burkina Faso	Ouagadougou	70 (1966)	65.8
Zaire	Kinshasa	60 (1969)	74.8
Zambia	Lusaka	48 (1969)	54.0
Low-income Asia			
Afghanistan	Kabul	21 (1971)	62.7
India	Calcutta	33 (1971)	24.0
	Bombay	25 (1971)	
	Delhi	30 (1971)	
	Madras	25 (1971)	
	Baroda	19 (1971)	
Indonesia	Jakarta	26 (1972)	21.8
	Bandung	27 (1972)	
	Makassar	33 (1972)	
Nepal	Katmandu	22 (1961)	54.3
Pakistan	Karachi	23 (1970)	45.5
Sri Lanka	Colombo	43 (1968)	24.8 (1990)
Latin America and the Caribbean			
Brazil	Rio de Janeiro	30 (1970)	22.3
	Belo Horizonte	14 (1970)	
	Recife	50 (1970)	
	Porto Alegre	13 (1970)	
	Brasilia	41 (1970)	
Chile	Santiago	25 (1970)	9.0 (2005)
Colombia	Bogotá	60 (1969)	13.1
	Calí	30 (1969)	
	Buenaventura	80 (1969)	
Ecuador	Guayaquil	49 (1969)	36.0
Guatemala	Guatemala City	30 (1971)	34.5
Honduras	Tegucigalpa	25 (1970)	27.5
Mexico	Mexico City	46 (1970)	11.1
Panama	Panama City	17 (1970)	25.8
Peru	Lima	40 (1970)	34.2
	Arequipa	40 (1970)	
	Chimbote	67 (1970)	
Venezuela	Caracas	40 (1969)	32.0 (2005)
	Maracaíbo	50 (1969)	
	Barquisimeto	41 (1969)	
	Ciudad Guayana	40 (1969)	

Source: City data are from Linn 1979; national data are from the United Nations' Millennium Development Goals database.

Note: A slum household is defined as a group of individuals living under the same roof in a dwelling that lacks one or more of the following conditions: access to improved water, access to improved sanitation, sufficient living area, durability. Figures in parentheses are years of the statistic.

FIGURE 1.1

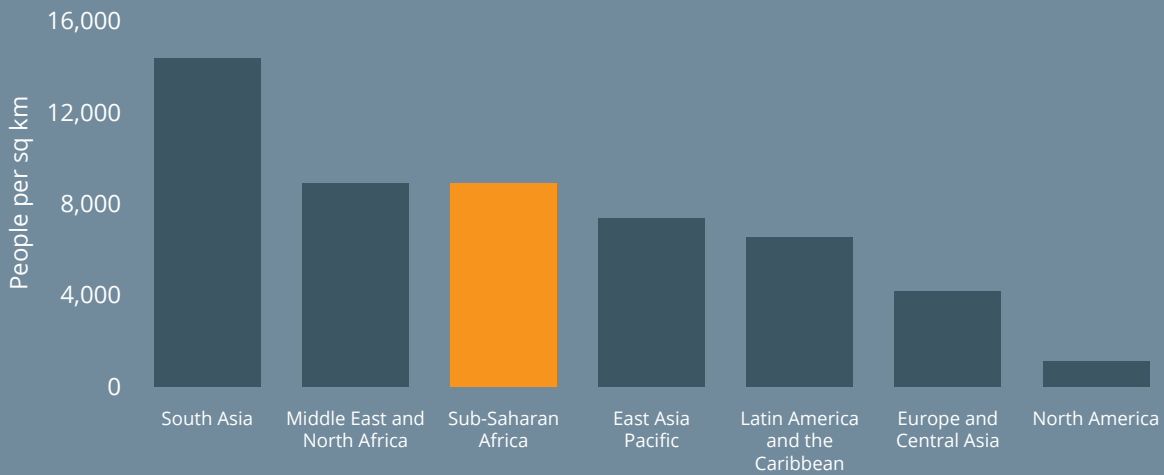
Very high proportions of city dwellers live in slums in Africa



Source: United Nations 2015. Note: Data are latest available for each country.

FIGURE 1.2

Population density in African cities is lower than in some other regions



Source: Data from Demographia 2015.



High rates of slum living within urban areas are characteristic of most African countries. Only two countries, Zimbabwe and South Africa, fall below the non-African average (figure 1.1). The proportion of Africans living in slums is not high because Africa has higher urban population densities than other countries. The average population density of African cities tracks the global average; it ranks third among seven global regions (figure 1.2).¹

High population density at the city's core, rapid tapering on the outskirts

Africa does not stand out in a list of the world's 50 densest cities (only 6 African cities make the list, most of them in the Democratic Republic of Congo). And although peak population density is higher in Africa than elsewhere, the difference is not statistically significant. Using a sample of 265 cities in 3 regions, Henderson and Nigmatulina (2016) estimate that peak urban population densities are higher in Africa (57,600 people per square kilometer) than in Latin American (37,700) or Asia (50,900). In a sample of 39 cities in developing and developed countries, Henderson and Nigmatulina (2016) finds peak densities of 55,700 people per square kilometer in Africa and 50,800 in other regions. In most African cities, population

and economic densities are higher near the city center and then fall steeply as one moves away. One kilometer away from the city center, average ambient population density falls 7 percent in African cities — a much more rapid rate of decline than the 4 percent in cities elsewhere. Economic activity as measured by nighttime light intensity falls at a rate of 15 percent in African cities, compared with 11 percent in non-African cities. In most African cities, the rate of decay of density gradients is above the sample median. Further, while most peak economic densities are below the median, most peak population densities are above the median.

People are clustering in downtown locations not because of the amenities or decent jobs they can access in central locations. These patterns reflect broader dysfunctionalities in land markets as well as limited investments in transport infrastructure, limiting the choices that people can make on where to live and how to access jobs (see chapter 5). For example in Nairobi, the current patterns of informal land use in centrally located settlements impose an economic loss of over \$1.8 billion (Henderson, Venables, and Regan, 2016). And in Dar es Salaam, poor residents face squalid living conditions alongside low earning potential in downtown informal settlements (box 1.1).

Not dense with capital

Capital investment in Africa over the past 40 years has averaged about 20 percent of GDP. In contrast, urbanizing countries in East Asia — China, Japan, the Republic of Korea — stepped up capital investment during their periods of rapid urbanization. Between 1980 and 2011, China's capital investment (infrastructure, housing, and office buildings) rose from 35 percent of GDP to 48 percent; during roughly the same period (1978–2012), the urban share of its population rose from 18 percent to 52 percent. In East Asia as a whole, capital investment remained above 40 percent of GDP at the end of this period, helping the region become very dense economically.

These contrasts underline the fact that Africa is urbanizing when poor — indeed, strikingly poorer than other developing regions with similar urbanization levels. In 1968, when countries in the Middle East and North Africa region became 40 percent urban, their per capita GDP was \$1,800 (in 2005 constant dollars). In 1994, when countries in the East Asia and Pacific region hit the 40 percent urbanization mark, their per capita GDP averaged \$3,600. By contrast, per capita GDP in Africa is just \$1,000.

Supporting rising population densities in African cities will require investments in buildings, and complementary physical infrastructure: roads, drainage, street lighting, electricity, water, and sewerage, together with policing, waste disposal, and health care. In the absence of higher levels of capital investment at around Asian levels, the potential benefits of Africa's cities are being overwhelmed by crime, disease, and squalor.

Overcrowding increases exposure to communicable diseases. Inadequate drainage increases the risk of malaria, and lack of sanitation raises the risk of dengue (Sclar, Garau, and Carolini 2005). Lack of access to clean water is a leading cause of diarrhea, which is responsible for an estimated 21 percent of deaths among children under five in developing countries — 2.5 million deaths a year (J-PAL 2012).

Evidence from a randomized evaluation of a Mexican housing program shows how improving floor quality in cities reduced the incidence of intestinal parasites, diarrhea, and anemia among young children while improving their cognitive development and their



BOX 1.1

Life in Africa's cities is often miserable: An urban migrant's story

In 1989, Fatma and her husband, Peter, sought to escape poverty by moving from rural Mbeya to Dar es Salaam. In many ways Dar es Salaam is better: Work is sometimes available, and services exist. But in some ways life is more hazardous than it was in Mbeya.

Despite savings, Fatma and Peter could not afford formal housing. To be close to work opportunities, they settled in a hazardous slum. Since then, rising housing costs or eviction have forced them to move more than a dozen times.

Today they live in Tandale, one of the city's largest slums. Built on a dumpsite just a few meters from the choked and contaminated river, their home sinks into the garbage a few inches every year. They share an open toilet with their neighbors and live in extreme poverty.

Why do they live in such conditions? Peter cannot afford transportation, so he walks wherever he goes. He leaves home every morning at 5 o'clock, walking to the city center, where he seeks day jobs as a mason. If there is no work — and often there is not — his family goes hungry. But if the family were living farther from the downtown, Peter would struggle to find work at all.

Fatma stays at home taking care of the couple's six children. She would like all of them to attend school, but only one does, because places for the others are lacking.

Despite low wages and high unemployment (estimated at 22 percent of the active labor force in 2014), Dar es Salaam is a relatively expensive city.





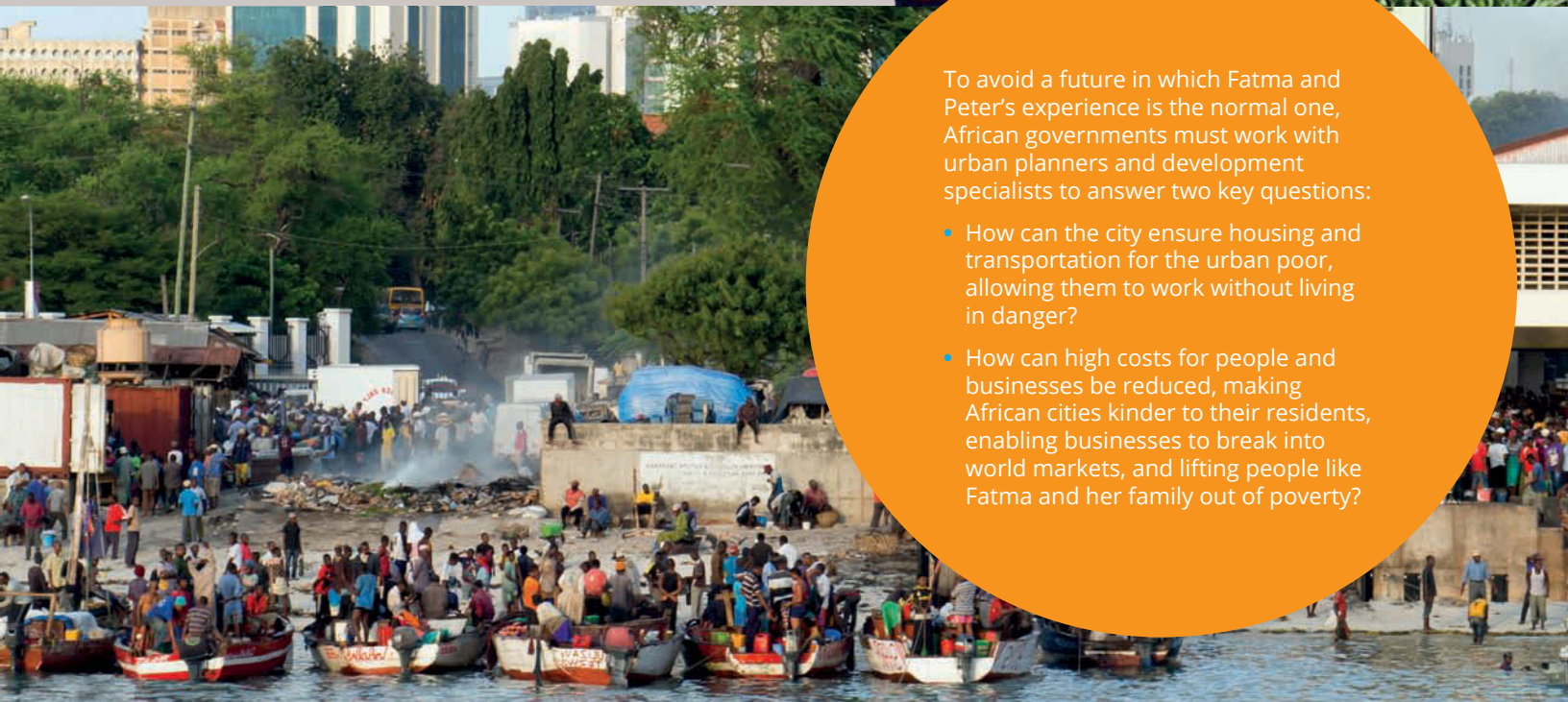
A meal costs twice as much as in Bangkok — even though average income in Bangkok is 23 times higher. Most of Fatma and Peter's income goes to food. Transportation, education, and health care are unaffordable.

Like millions of Africans, Fatma and Peter have had to give up livability in their quest for opportunity. The only central location they can afford is full of dangers. When Fatma and Peter migrated to the city, Dar es Salaam was about one-third of its size today. It now has more than 4.3 million residents, and it is projected to reach 10 million or more by the early 2030s, making it a “megacity.” Many more families like Fatma's may soon be living in Dar es Salaam.

Source: World Bank 2015c.

To avoid a future in which Fatma and Peter's experience is the normal one, African governments must work with urban planners and development specialists to answer two key questions:

- How can the city ensure housing and transportation for the urban poor, allowing them to work without living in danger?
- How can high costs for people and businesses be reduced, making African cities kinder to their residents, enabling businesses to break into world markets, and lifting people like Fatma and her family out of poverty?



mothers' mental health and happiness (Cattaneo and others 2009). The program was associated with a 20 percent reduction in the presence of intestinal worms, a 13 percent reduction in the prevalence of diarrhea, and a 20 percent decline in the prevalence of anemia. Children 12- to 30-months-old scored 30 percent higher than controls on a communicative development test.

Further, improved access to piped water in urban areas has been shown to decrease infant mortality. Galiani, Gertler, and Schardrotsky (2005) show that the privatization of water services in Greater Buenos Aires improved young children's health outcomes by improving service quality and access to safe water, especially in the poorest areas, which benefited most from service expansion. Child mortality from infectious diseases dropped about 8 percent in areas that privatized the services, with the largest decline (26 percent) in the poorest areas. Gamper-Rabindran, Khan, and Timmins (2010) show that infant mortality in urban areas in Brazil declines as living standards improve.

In urban Morocco, connecting houses to water had no sizable effect on health outcomes, but convenient

access to water improved household welfare by freeing up the time usually spent to fetch water. Tensions over water-related issues (such as shortages) decreased, and people reported spending more time on leisure and social activities. The program increased reported happiness and improved social integration (Devoto and others 2012).

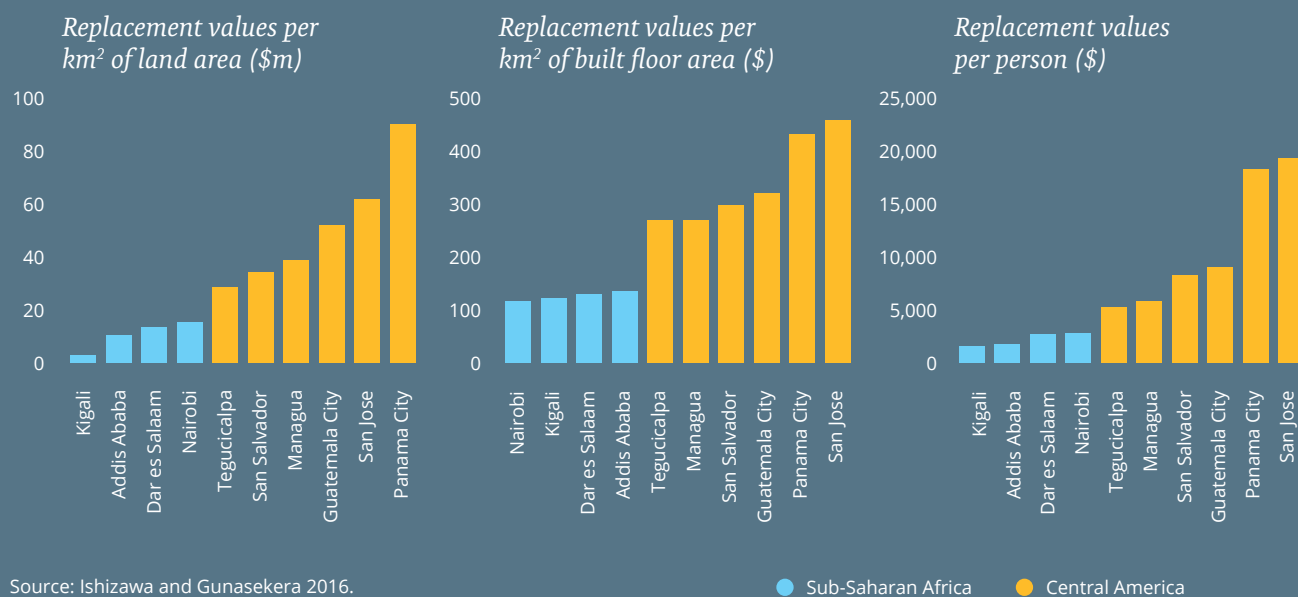
Improved access to electricity improves health outcomes by reducing the inhalation of kerosene fumes and the risk of kerosene-related accidents, a frequent cause of burns. It also allows children to study after dark (see Wu, Borghans and Dupuy 2010 on Indonesia; Spalding-Fecher 2005 on South Africa; and UNDESA 2014).

Not dense with buildings

Evidence of overcrowding and low levels of capital investment appear in the value of building stocks. Disaster risk profiles were developed for four African cities. This methodology estimates the economic value of building stock and its distribution across the city at 1 square kilometer resolution. The total economic value of buildings in Dar es Salaam is estimated at about \$12 billion — about five times the city's contribution to GDP. Even lower are the estimated

FIGURE 1.3

The value of building stocks in African cities is low



Source: Ishizawa and Gunasekera 2016.

● Sub-Saharan Africa ● Central America



values for Nairobi, Kenya (\$9 billion); Addis Ababa, Ethiopia (\$6 billion); and Kigali, Rwanda (\$2 billion) (Ishizawa and Gunasekera 2016).

The value of urban building stocks is much lower in Africa than in Central America (figure 1.3). The value per square kilometer in the four African cities studied ranges between \$2.7 million (in Kigali) and \$15.6 million (in Nairobi). In contrast, the range in Central America is \$27.8–\$90.4. The results are similar when other measures or value are compares. As elsewhere in the world, residential and commercial buildings are concentrated downtown (box 1.2).

Not dense with amenities, not livable

In most of the developing world — from India and Vietnam to Brazil and Colombia — large cities usually have better living standards than smaller cities. In countries where governments are still struggling to bring water and sanitation to most of the population, large cities usually fare better. In Brazil, where access to piped water is converging toward universal coverage, smaller cities lag behind metropolitan areas, with less than 90 percent coverage. In India, coverage levels reach 70 percent of the population in the largest cities reach but less than 50 percent in the smallest cities.

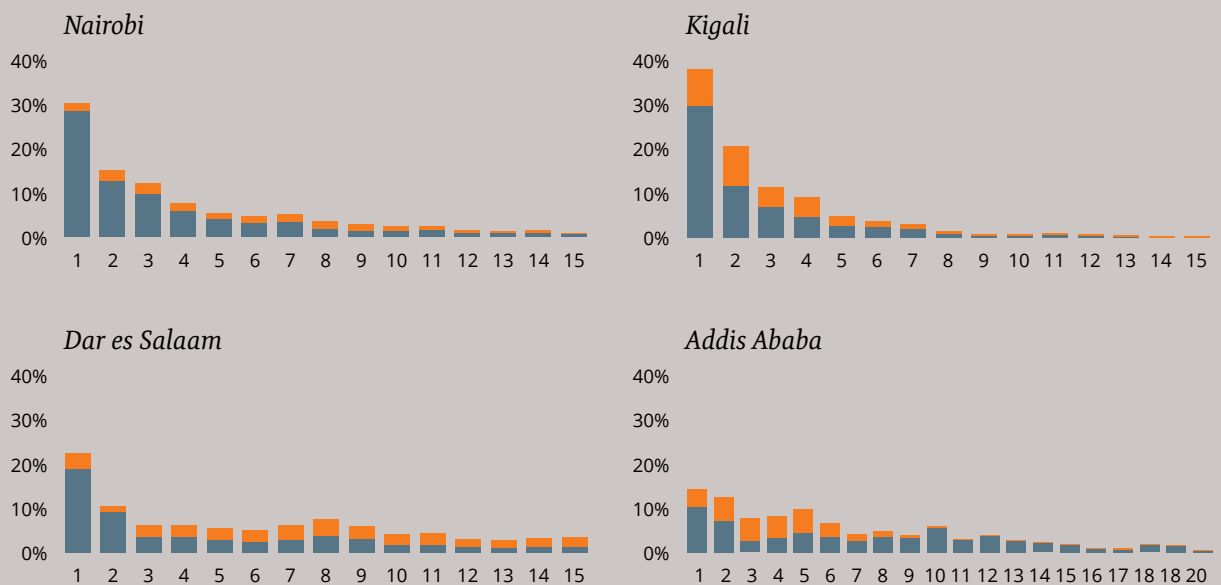


BOX 1.2

The most valuable building structures are concentrated near the city center

Building values are highly concentrated near the city center. In Nairobi, Kigali, and Dar es Salaam, more than 20 percent of the value of buildings in the city is concentrated in the square kilometer around the city center. Addis Ababa is less concentrated, although a small peak exists there, too (box figure 1.2.1).

BOX FIGURE 1.2.1



Source: Ishizawa and Gunasekera 2016.

● Non-residential ● Residential

Coverage in Africa is lower — and it is not, on average, higher in larger cities. In Uganda, for example, coverage hovers around 20 percent for large, medium, and small cities (World Bank 2013).

Two patterns of living standards (measured by household durable assets, housing conditions, and infant survival rates) are evident in Africa (Gollin, Kirchberger, and Lagakos 2016):

- A wide variation of living standards is observed within countries, with urban areas ranking consistently higher across indicators.
- The links between density and living standards are strong in African countries, with a significant and positive correlation found consistently across countries.⁷

Although population density and living standards are correlated, higher population density does not imply a livable environment.

Access to electricity increases as density rises in all 20 of the Sub-Saharan African countries studied. The cost to provide piped water in dense urban areas is an estimated \$0.70–\$0.80 per cubic meter — far less than the \$2 per cubic meter in sparsely populated areas (Kariuki and Schwartz 2005). Data for Colombia suggest that the operating costs for solid waste disposal services in large and dense metropolitan areas can be one-third to one-half the cost in smaller, less dense cities (Trojanis and Lozano-Gracia 2016).

At the national level, density and livability seem to be correlated in Africa. But within cities, the relationship is not straightforward. Although households in denser areas are better off than households in other areas of the country, living standards drop when crowding supplants density.

Population densities are rising and cities expanding rapidly in Africa: The largest cities are growing by as much 4 percent a year (United Nations 2014). Infrastructure investments have remained low, however, making density look a lot like crowding. African cities have failed to absorb large increases in population successfully because of lack of basic services, limited budgets in expensive cities, and limited connective infrastructure.

During the mid-1970s, the share of the population with access to water supply and sewage disposal was similar in Saharan Africa and South Asia. Since then, the gap between the two regions has widened dramatically (table 1.2). In urban areas in 2015, 88 percent of residents in South Asia but just 64 percent in Sub-Saharan Africa had access to improved water. The gap was even larger for improved sanitation, which reached 71 percent of urban residents in South Asia but just 46 percent of urban residents in Sub-Saharan Africa.

Table 1.2 Percent of population with access to water and sanitation, by region

Region	Mid-1970s				2015			
	Access to water		Access to sewage disposal		Access to improved water		Access to improved sanitation	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Sub-Saharan Africa	66	10	70	14	89	64	46	27
South Asia	66	17	67	3	93	88	71	55
East Asia and Pacific	58	10	67	15	96	87	85	69
Latin America and the Caribbean	78	35	80	25	97	89	88	77

Source: Data for 1970s are from Linn 1979. Current data are from World Development Indicators 2016.

Note: Access to an improved water source refers to the percentage of the population using an improved drinking water source (including piped water on premises (piped household water connection located inside the user's dwelling, plot or yard), and other improved drinking water sources (public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs, and rainwater collection). Access to improved sanitation facilities refers to the percentage of the population using improved sanitation facilities, that is, likely to ensure hygienic separation of human excreta from human contact. They include flush/pour flush (to piped sewer system, septic tank, pit latrine), ventilated improved pit (VIP) latrine, pit latrine with slab, and composting toilet.



Analysis of low- and lower-middle-income countries shows how urban areas of Sub-Saharan Africa perform with respect to other regions. The analysis compares three measures: improved water, improved sanitation, and mortality caused by road traffic injury. The empirical estimation is specified as follows:

$$WDI = \theta_1 1 \text{ Regdummy} + \theta_2 \log \text{gdppc} + \theta_3 \log \text{landarea} + \theta_4 \% \text{urban} + \varepsilon_i$$

where WDI is the World Development Indicator measure; Regdummy is a dummy taking a value of 1 if the worker lives in South Asia (the base case) and different values for other regions; $\log \text{gdppc}$ denotes the log value of GDP per capita in the country, adjusted for purchasing power parity; $\log \text{landarea}$ gives the log value of the country's land area in square kilometers; and % urban denotes the percentage of population residing in urban areas.

The results indicate that South Asia (the base case) has more than 15 times greater access to improved sanitation than Sub-Saharan Africa and much lower

mortality from traffic congestion. Europe and Central Asia and the Middle East and North Africa have much better access to improved sanitation than South Asia. Even controlling for poverty and urbanization levels, Sub-Saharan Africa lags other developing regions in these urban development indicators.

Research based on household surveys for 20 countries suggests that across Sub-Saharan Africa the proportion of households with shelter and infrastructure amenities varies not only by population density but also by amenity type, urban area type, and household expenditure quintile (table 1.3).

Table 1.3 Housing amenities in Sub-Saharan Africa, by type of area and expenditure quintile
(percent of all households)

Variable	Type of area				Expenditure quintile	
	All areas	Largest city	Other urban	Rural	Bottom	Top
Shelter amenities						
Roof	16.1	18.6	19.6	13.7	15.4	18.0
Walls	65.8	90.3	80.0	53.0	58.7	72.1
Floor	52.8	91.4	77.0	35.2	40.7	65.8
Housing infrastructure						
Electricity	31.6	69.4	49.5	13.4	20.1	43.0
Toilet	27.6	48.8	38.3	17.6	19.6	35.5
Water	38.2	77.3	61.0	17.8	30.5	45.1
Other						
Home ownership	70.6	40.8	53.0	85.5	78.1	61.5
Lack at least one shelter amenity	92.5	85.3	87.6	96.6	94.9	89.2
Lack at least one shelter infrastructure structure	89.9	70.1	82.4	98.0	89.2	83.7
Overcrowded	17.6	17.8	16.0	18.4	30.4	7.4

Source: Lozano-Gracia and Young 2014.

Note: Figures are the means taken across all countries' reported percentages of housing amenities. For example, the percentage of households that have a permanent roof was calculated by country (and broken down by urban areas and quintiles); the figures shown are the mean percentages of households with a roof, where each observation is one country. This method prevents biasing the percentages toward countries with larger samples.

Amenities are poor across all areas and income quintiles. Only 16 percent of urban households in Africa have permanent roofs — and access is even lower in rural areas. Between 70 percent (in the largest cities) and 98 percent (in rural areas) of all Africans lack access to electricity, a toilet, or water.

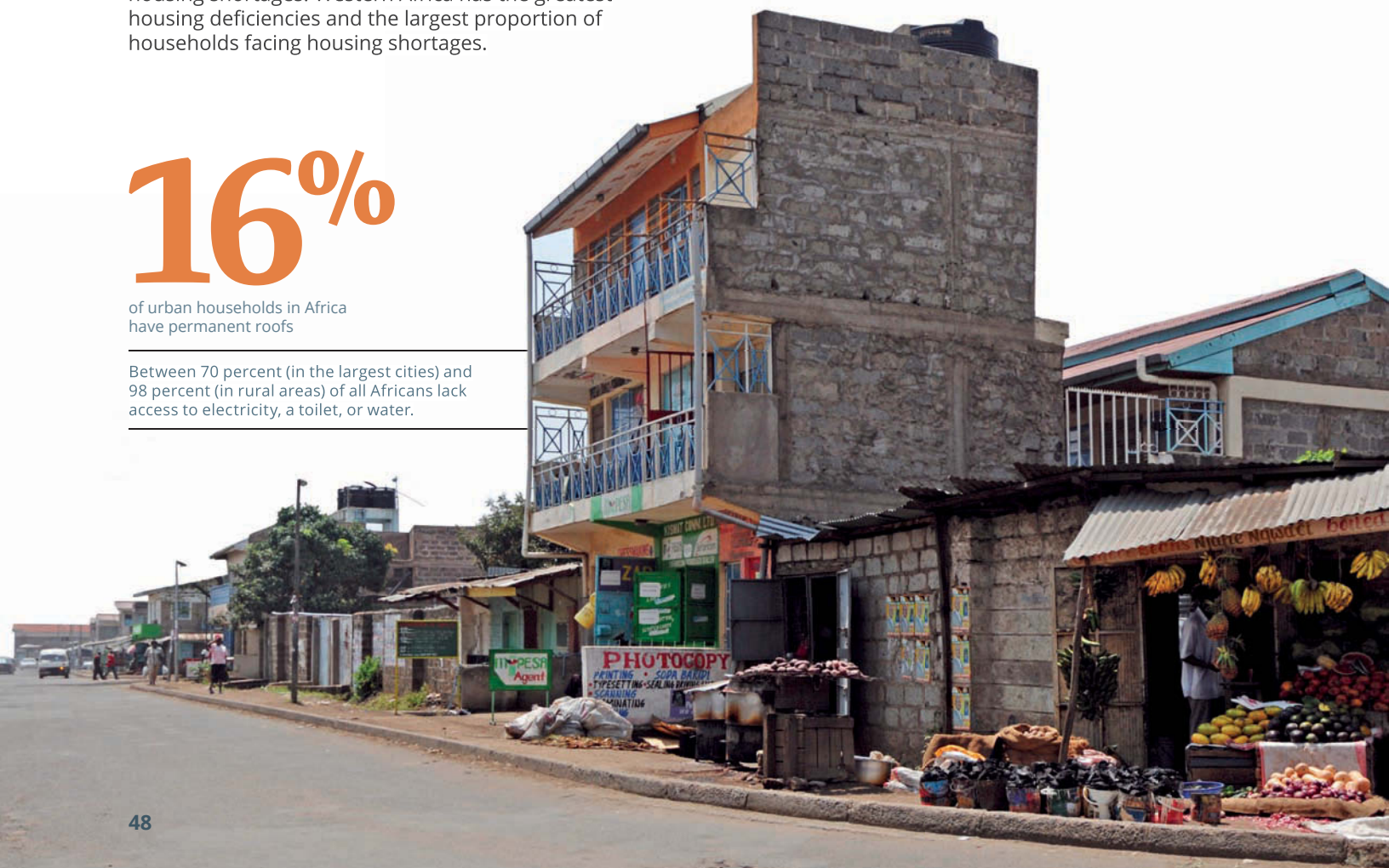
The differences between the proportions of households that have access to housing amenities also varies significantly across expenditure quintiles. They are statistically significant at the 1 percent level for all amenities and infrastructure, indicating the stark difference between housing for the richest and the poorest households in Sub-Saharan Africa.

Housing conditions in Sub-Saharan Africa vary by subregion, country, and type of urban area. Shortages are less acute in Middle Africa than in Eastern and Western Africa (map 1.1). Eastern Africa has the largest share of households in overcrowded conditions, the smallest share of households with permanent floors and access to toilets, and the largest percentage of households with electricity connections. Middle Africa has the smallest share of households with electricity connections but the smallest share of people facing housing shortages. Western Africa has the greatest housing deficiencies and the largest proportion of households facing housing shortages.

16%

of urban households in Africa have permanent roofs

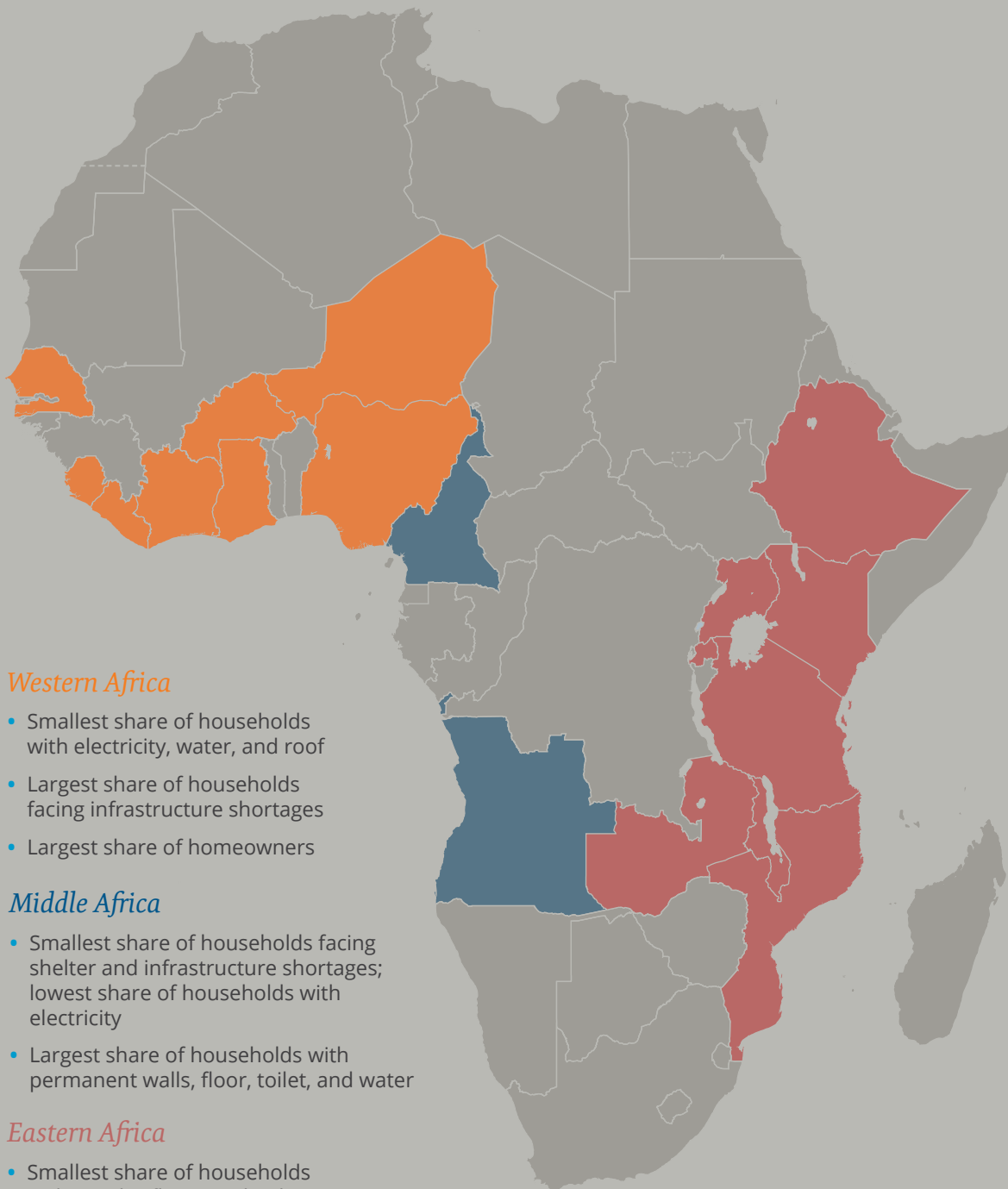
Between 70 percent (in the largest cities) and 98 percent (in rural areas) of all Africans lack access to electricity, a toilet, or water.





MAP 1.1

Housing conditions and shortages in Sub-Saharan Africa



Western Africa

- Smallest share of households with electricity, water, and roof
- Largest share of households facing infrastructure shortages
- Largest share of homeowners

Middle Africa

- Smallest share of households facing shelter and infrastructure shortages; lowest share of households with electricity
- Largest share of households with permanent walls, floor, toilet, and water

Eastern Africa

- Smallest share of households with nondirt floors and toilets
- Largest share of households with electricity
- Largest share of households living in overcrowded housing

Note: Subregional classifications are adopted from the United Nations.

Source: Lozano-Gracia and Young 2014.

Case studies

Access to amenities in Dar es Salaam, Durban, and elsewhere in Africa

Living standards also vary widely within cities, as recent surveys of Dar es Salaam and Durban reveal.

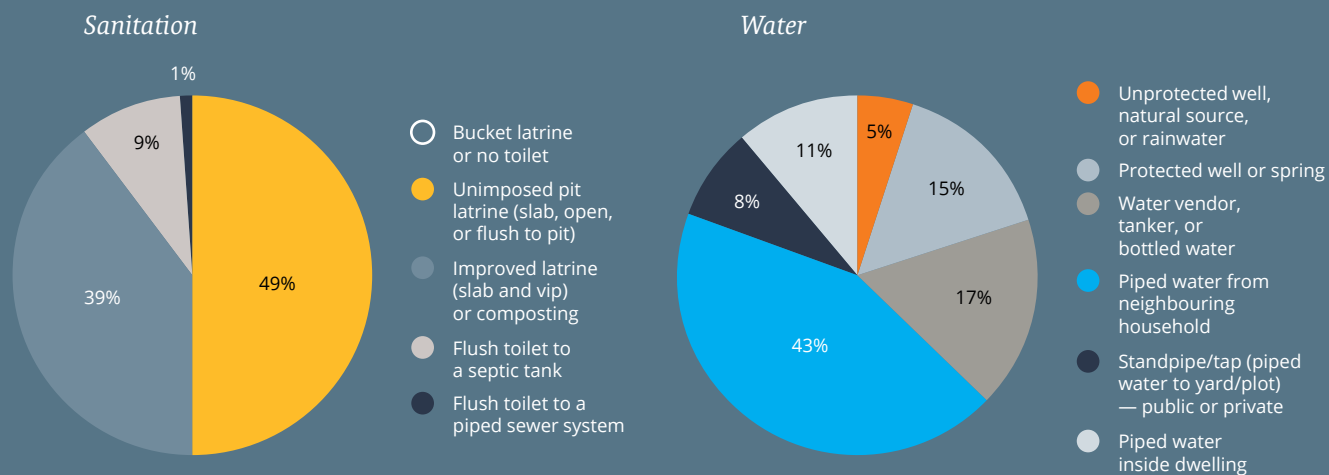
Dar es Salaam, Tanzania

About two-thirds of households in Dar es Salaam share their toilet facilities, and there is some indication that access rates are relapsing: Of the households in the survey that do not currently have access to sanitation, 15 percent said that they had access in a house they previously lived in, in Dar es Salaam. The most common form of improved sanitation is an improved pit latrine; other forms of improved sanitation are rare. Pit latrines are the most common form of unimproved sanitation (figure 1.4).

Access to water and sanitation is very limited throughout the city. It is slightly higher in peripheral areas than in central areas (figure 1.5). Households in the city's core rely mainly on improved pit latrines or pour flush to pit as their main toilets. The distribution of households by type of toilet remains similar across city areas, except in shanty areas, where a larger share of the population uses unimproved sanitation. Flush toilets connected to a septic tank are more common on the periphery.

FIGURE 1.4

Large shares of the population in Dar es Salaam lack access to basic sanitation and water services



Source: World Bank 2015c.

Note: Improved latrine combines 33 percent slab latrine and 6 percent VIP latrine; unimproved sanitation includes 26 percent unimproved, 16 percent open slab, and 7 percent pour flush to pit.



Access to piped water is also very limited throughout the city, with only 17 percent of households in the city center and 14 percent on the periphery having piped water. In the city as a whole, only 11 percent of households report piped water as their main source of drinking water. The shares are much lower for households in shanty areas in the center (9.5 percent) and in the consolidated city (7.7 percent).

Access to electricity is much better toward the city center, where more than 70 percent of households (including households in shanty areas) have access. Access decreases with distance from the city center, with less than 45 percent of households on the periphery connected to the grid. Despite the high connection rate, the majority of households use charcoal as their main fuel for cooking.

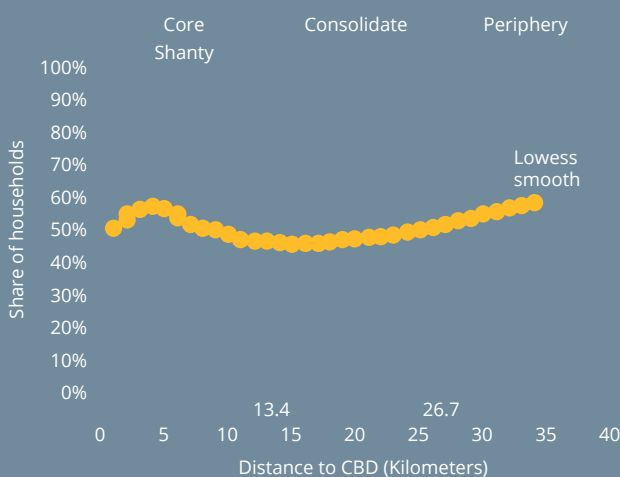
Residents of Dar es Salaam seem to be benefiting to some extent from being closer to one another: More than 40 percent of households report using piped water from a neighboring household as their main source of water (figure 1.6). The share is much higher in shanty areas (51 percent of households).

While more than 60 percent of households in the city center and 80 percent in shanty areas report sharing their toilet facilities, only 36 percent of households on the periphery do so. When asked about the main constraint of not having piped water in their homes, more than 20 percent of households in all areas identified connection cost as the main hurdle. Half of all households indicated that they lacked access because their home was rented.

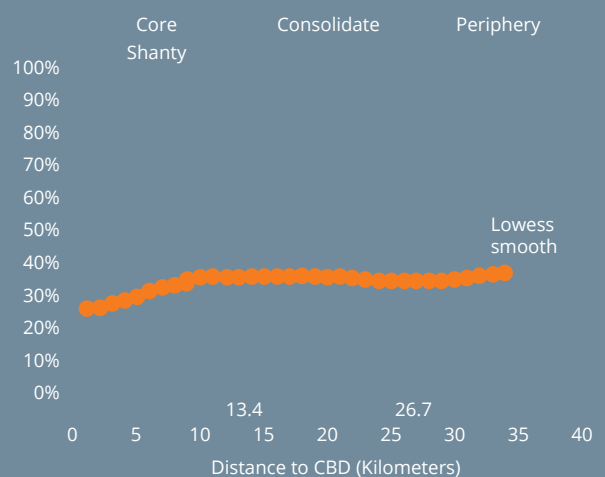
Even people with access to piped water in their homes face challenges related to service quality. On average, households reported having fewer than 5 days and 14 hours a day of service in the previous 7 days. Low quality forces more affluent households and businesses to rely on private boreholes, leading to saltwater intrusion (Mtoni and Walraevens 2010; Jones and others 2016).

FIGURE 1.5
 Access to improved water and sanitation in Dar es Salaam tends to rise with distance from the center

Percentage of households with access to improved sanitation



Percentage of households with access to improved water

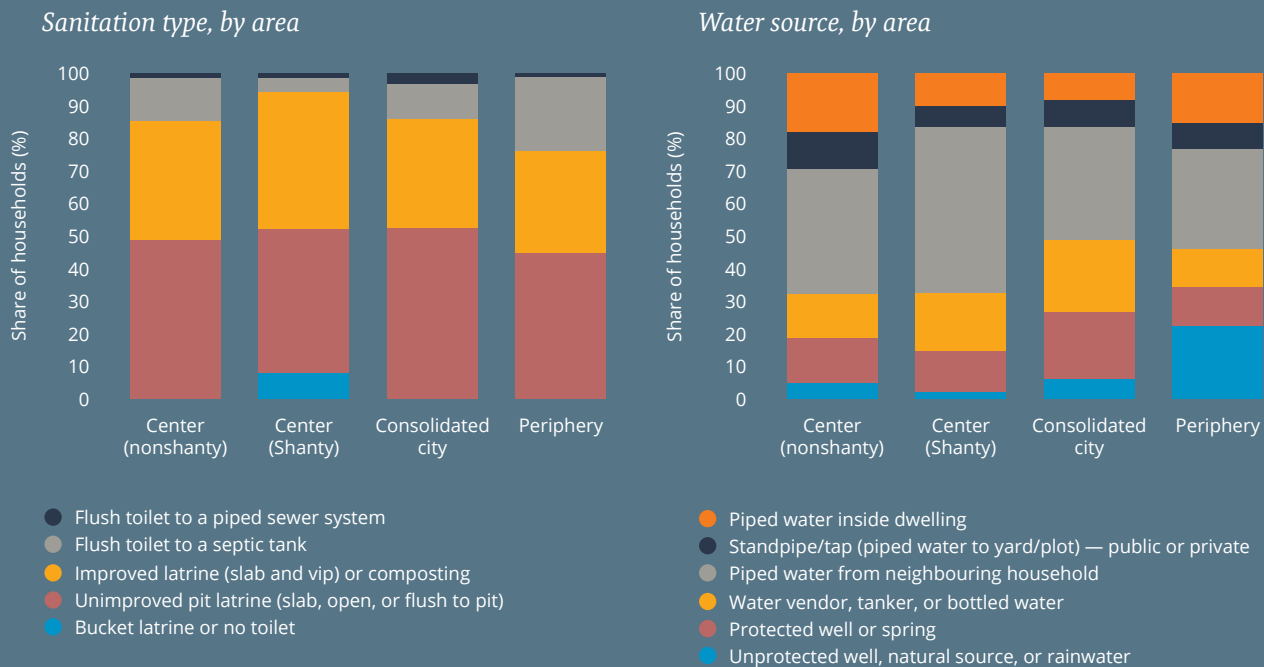


Source: World Bank 2015c.

Note: Smooth lines are based on locally weighted regressions.

FIGURE 1.6

Access to improved sanitation and piped water at home is low across Dar es Salaam



Source: World Bank 2015c.

Durban, South Africa

The story is quite different in Durban, where more than two-thirds of households have access to piped water (against 14–17 percent in Dar es Salaam). Within-city variations in access are wide, however. Almost 87 percent of households in the urban core have piped water in their dwelling, but less than 20 percent on the outskirts of the city and less than 15 percent in shanty areas do. In shanty areas, households rely less on neighbors than in Dar es Salaam: Less than 5 percent of households in shanty areas and less than 8 percent of households in rural areas cite their neighbors' dwelling as their main source for drinking water. Almost 42 percent of households in shanty areas and 52 in rural areas rely on yard taps. Street standpipes are also an important source in shanty areas, with 36 percent of households relying on them for drinking water.

Durban is also far ahead of Dar es Salaam on sanitation. Variations in access are wide, however: Almost 92 percent of households in the urban core are connected to the sewerage system, but only 19 percent in the outskirts of the city and 45 in shanty areas are. In shanty areas, which in Durban are not very far from the city's core, 44 percent of households still rely on pit latrines as their main form of sanitation, against 15 percent in peri-urban formal areas and 76 percent in rural areas on the outskirts of the city.

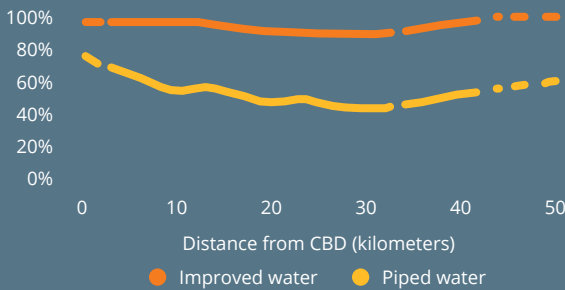
Access to piped water and a flush toilet in the house fall with distance from the city center (figure 1.7). The average increase beyond 35 kilometers from the city center should be interpreted with care, however, because it is driven by the greater access in peri-urban areas farther from the city center. (Further exploration using a local polynomial estimation suggests some over-smoothing is happening that hides these low access values in rural areas.)



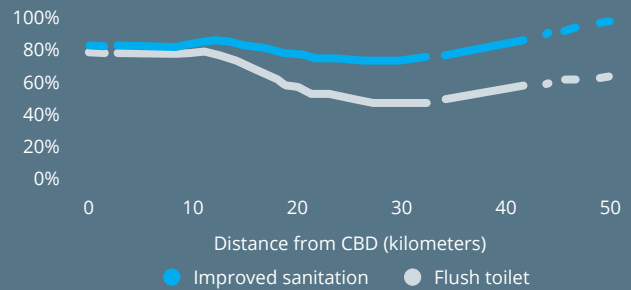
FIGURE 1.7

Durban: Some challenges are met, but many remain

Piped water in house



Flush toilet in house



Source: World Bank 2015c.

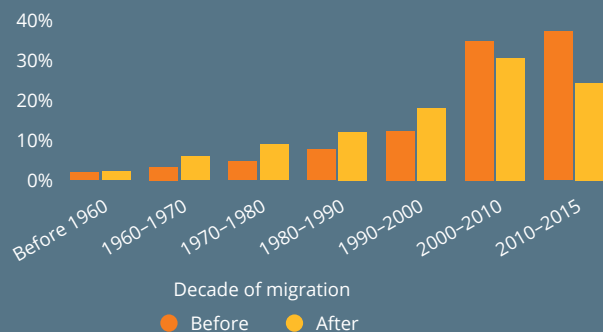
Note: Smooth lines are based on locally weighted regressions.

Migrants who arrived in Durban between 1960 and 2000 enjoyed improvements in access to basic services relative to their previous residence. Migrants today face a deterioration in living standards (figure 1.8). They sacrifice living standards in search of the opportunities the city offers.

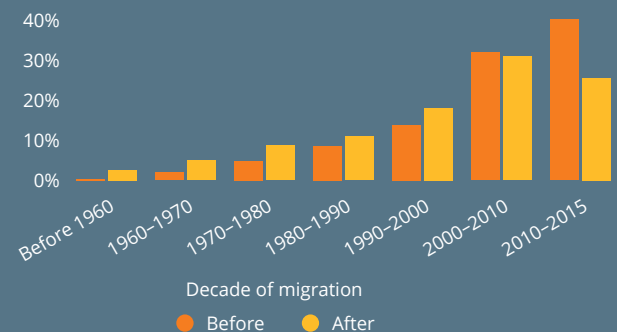
FIGURE 1.8

Moving to Durban improved migrants' access to basic services before but not after 2000

Households with Improved water



Households with Improved sanitation

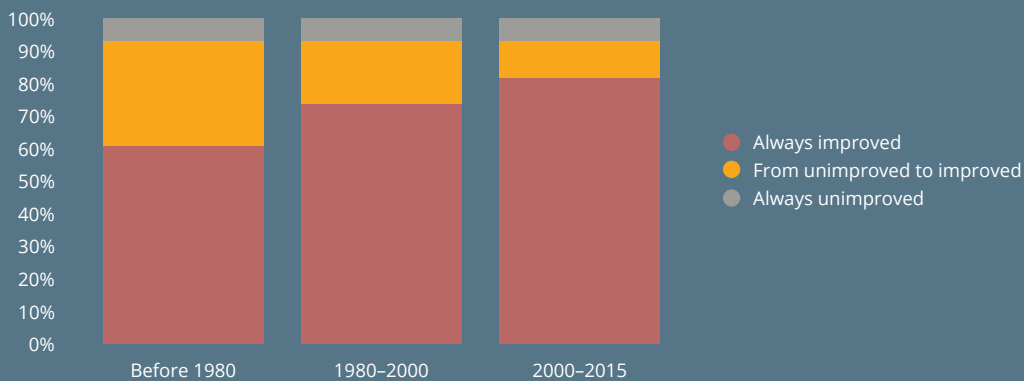


Source: World Bank 2015c.

Household moves within the city reflect a similar trend. Before 1980, about 31 percent of within-city moves were from a house that did not have access to improved sanitation to one that did. These figures fell to 18.8 percent for 1980–2000 and 10.6 percent for 2000–15 (figure 1.9).

FIGURE 1.9

Within-city moves in Durban are less likely to yield better sanitation than they did in the past



Source: World Bank 2015c.

Elsewhere in Africa

Infrastructure and public services are concentrated in central areas and formal neighborhoods in Africa's cities, where access to water and electricity expanded between 1997 and 2013. Access to services declines rapidly once one leaves the center, however; peri-urban areas and informal neighborhoods have limited access to basic services.

The pressing challenges observed in Dar es Salaam and Durban are not unique to those cities. In Côte d'Ivoire, urban audits in 2013 showed that although infrastructure and public services are adequate in central areas and formal neighborhoods, they are lacking in peri-urban and informal neighborhoods, where basic infrastructure has failed to keep up with population growth. In San Pédro, for example, a city of about a quarter million people, informal neighborhoods with limited access to basic services cover about a third of the urban landscape. In Bouaké,

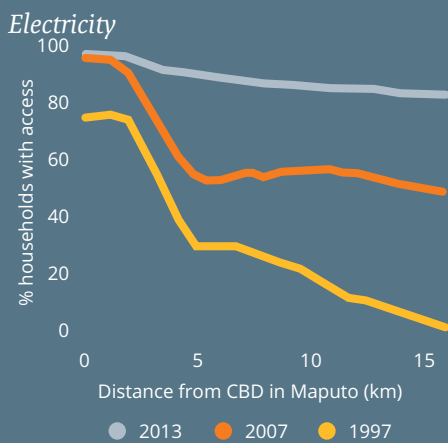
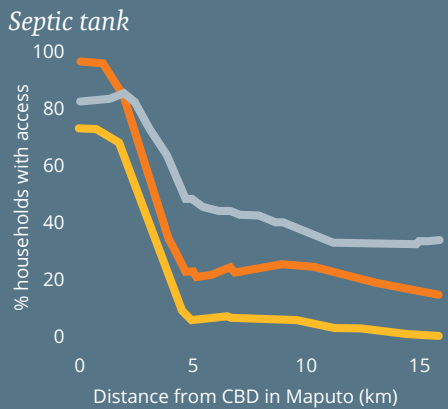
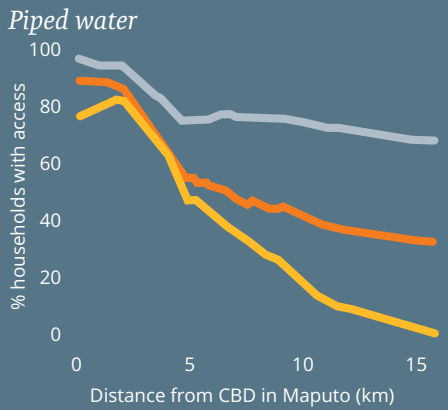
a city with more than half a million people, peri-urban neighborhoods are growing without access to water and electricity (formal neighborhoods in the center also have inadequate infrastructure) (World Bank 2016). In the communes (municipalities) of Abidjan where urban audits were conducted (particularly Yopougon, the largest), more than half the residential neighborhoods have limited access to public services and infrastructure.

In Ghana, access to piped water, waste disposal, and toilet facilities in Accra and Kumasi decreases rapidly as distance to the city center increases (World Bank 2015d). In Maputo, Mozambique, access to basic services is strongly concentrated in the city center, dropping off rapidly outside the center (figure 1.10). In Kinshasa, the Democratic Republic of Congo, access to piped water and septic tanks remains relatively low and declines with distance from the center (figure 1.11).



FIGURE 1.10

Access to piped water, septic tanks, and electricity improved in Maputo, Mozambique between 1997 and 2013

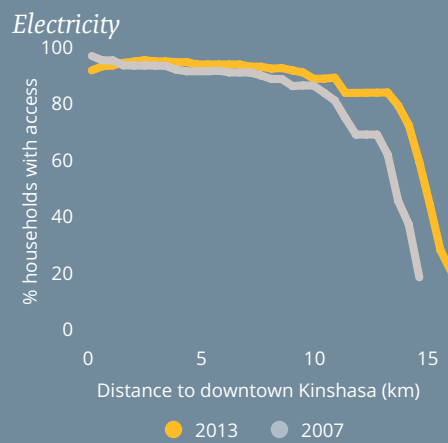
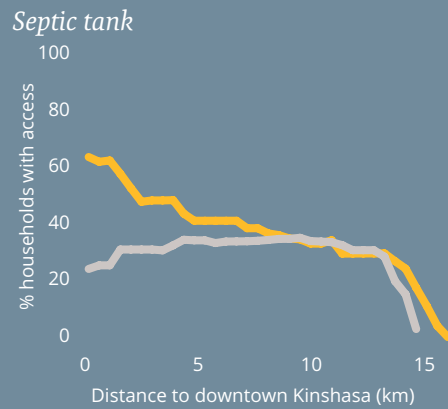
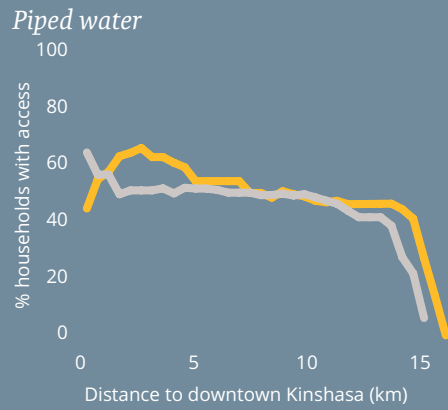


Source: Nakamura 2016.

Note: Smooth lines are based on locally weighted regressions.

FIGURE 1.11

Access to piped water, septic tanks, and electricity improved in Kinshasa, Democratic Republic of Congo between 2007 and 2013



Source: Data from Demographic and Health surveys conducted in 2007 and 2013/2014.

Note: Distance is measured from Gombe. Smooth lines are based on locally weighted regression.

In Nigeria, only Lagos and Abuja have sewerage systems, and even in those cities the majority of households are not connected: Just 6 percent of urban households have a pour/flush toilet connected to a piped sewerage system (World Bank 2005). In Ethiopia, only Addis Ababa has a sewerage system — and the system serves only 10 percent of the population. In 2012, only 44 percent of the population of Addis Ababa has access to safe water; full coverage of 100 liters per person per day would require a two- to threefold increase in the water supply (World Bank 2015a). In other urban areas, access to water is even lower and even waste collection is limited: For Sub-Saharan Africa as a whole, only 45–82 percent of locally generated waste in urban areas is collected.

The lack of basic services puts further pressures on household budgets. Alternative sources of water are almost always far more expensive than piped water. In Lagos, the cost of buying informal water and garbage pickup is 1.3–3 times greater than the tariffs charged by the state (World Bank 2015b). In Accra, the cost of water from small-scale water sources, such as bottles and water “sachets,” is typically five to seven times higher than piped water (World Bank 2015d). In Bouaké, Côte d’Ivoire, most taps are broken, forcing residents to buy potable water from informal water vendors, who can price hikes and sell unsafe or illegally sourced water (World Bank 2016).

Low human capital

For urban areas to be productive better human capital is needed. Workers bring to the workplace a bundle of skills that affect their productivity. Cognitive skills have long been recognized as an important determinant of productivity and wages. A growing body of evidence documents that, at least in the developed world, larger cities reward educated workers more than smaller cities do—one reason larger cities tend to attract higher-skilled workers.

Labor force participation rates in Sub-Saharan Africa do not lag other developing areas. But, on average, people in Sub-Saharan Africa are less educated and

have worse health than people in other regions, adversely influencing the overall quality of the urban labor supply.

In attainment of education and literacy, Sub-Saharan Africa lags behind other developing regions of the world and has done so historically. South Asia is one exception which had poorer literacy than Sub-Saharan Africa in the 1990s, but over time overtook the latter. Sub-Saharan Africa, which has surging youth population levels, has the lowest levels of youth literacy today (tables 1.4 and 1.5).

Table 1.4 Adult literacy rate, population 15+ years

Region	1990	2000	2010
East Asia and Pacific	79.7	90.8	94.5
Latin America and Caribbean	85.2	88.6	91.5
Middle East and North Africa	56	68	77.9
South Asia	46.5	58	66.7
Sub-Saharan Africa	52.5	57	60.3

Source: UNESCO Institute for Statistics.

Note: Percentage of the population age 15 and above who can, with understanding, read and write a short, simple statement on their everyday life. Generally, ‘literacy’ also encompasses ‘numeracy’, the ability to make simple arithmetic calculations. This indicator is calculated by dividing the number of literates aged 15 years and over by the corresponding age group population and multiplying the result by 100.

Source: UNESCO Institute for Statistics.



Table 1.5 Youth literacy rate, population 15–24 years, both sexes (%)

Region	1990	2000	2010
East Asia and Pacific	93.6	97.9	98.8
Latin America and Caribbean	92.9	96.0	97.5
Middle East and North Africa	76.2	86.1	91.8
South Asia	59.1	72.6	83.4
Sub-Saharan Africa	64.7	68.2	70.8

Source: UNESCO Institute for Statistics.

Note: Number of people age 15 to 24 years who can both read and write with understanding a short simple statement on their everyday life, divided by the population in that age group. Generally, 'literacy' also encompasses 'numeracy', the ability to make simple arithmetic calculations. Divide the number of people aged 15 to 24 years who are literate by the total population in the same age group and multiply the result by 100.

Source: UNESCO Institute for Statistics.

Larger cities also pay a wage premium to workers with better social skills (Bacolod, Blum, and Strange 2009). This finding is unsurprising given that cities are often modeled as “interactive systems” in which the urban structure reflects the net benefits of interactions (that is, the value of interactions net of transportation costs) (see Fugita and Thisse 2002, among others). In France, human capital externalities increase earnings via greater communication in the workplace. This effect is larger in bigger and more educated cities (Charlot and Duranton 2004).

The World Bank’s STEP (Skills towards Employment and Productivity) Skills Measurement Program is the first initiative to develop a consistent measure of skills — cognitive and social — in low- and middle-income countries. It integrates unique modules in household surveys to directly gauge the soft skills of respondents. The STEP survey includes questions that directly assess reading, writing, and computer skills (cognitive skills) as well as questions assessing decision making, personality, and behavior (social skills). It also asks questions on whether physical skills are used at work (table 1.6).

The STEP survey was used to analyze skills premiums in the capital relative to other urban areas in two African countries (Ghana and Kenya) and five comparators (Armenia, Colombia, Georgia, and Vietnam). The skill indexes were constructed for each respondent using factor analysis.

Table 1.6 Skills assessed in the STEP survey

Index	Measure
Cognitive skill index (at and outside work)	<ul style="list-style-type: none"> • Read (forms, bills, financial statements, newspapers or magazines, instruction manuals, books, reports, and so forth); length of readings • Write at work; length of writings • Show numeracy (measure of size, weight, distances, price calculation, more advanced mathematics, and so forth) • Use a computer; type of software used • Show thinking and show learning
Social skill index	<ul style="list-style-type: none"> • Interact with others (clients, public, colleagues) • Make a formal presentation • Supervise the work of others <p>Responses to questions about personality and behavior (answers are almost always, most of the time, some of the time, and almost never).</p> <ul style="list-style-type: none"> • Are you talkative? • Do you like to keep your opinions to yourself? Do you prefer to keep quiet when you have an opinion? • Are you outgoing and sociable — for example, do you make friends very easily? • Do you like to share your thoughts and opinions with other people, even if you don't know them very well? • Do you ask for help when you don't understand something? • Do you think about how the things you do will affect others?
Physical skill index	<ul style="list-style-type: none"> • Operate or work with any heavy machines or industrial equipment • Regularly have to lift or pull anything weighing at least 50 pounds • Have a physically demanding job

Figure 1.12 (overleaf) shows the standardized distribution of skills between the capital and other urban areas in each country. Across countries, the left-tail density is higher than the right-tail density, indicating that most urban workers are poorly endowed with these skills. In most countries, the distribution of cognitive skills in the capital city is denser, because workers with higher cognitive skills prefer to work in larger cities. This pattern is not as pronounced in Ghana and Kenya, however, suggesting that such sorting is not as important in Africa as it is elsewhere.



BOX 1.3

The contribution of cognitive and noncognitive skills to urban performance

The empirical estimation is specified as follows

$$\log w_i = \theta_1 cc_i + S'_i \theta_2 + (cc_i \times S'_i) \theta_3 + X'_i \beta + \varepsilon_i$$

where w_i is the nominal wage of worker i ; cc_i is a dummy taking a value of 1 if the worker lives in the capital city; S'_i denotes a worker's cognitive, social, and physical skills; and X'_i is a vector comprising the worker characteristics, including educational attainment, the size of the firm, the number of hours worked, and the number of tasks assigned. Occupation and industry fixed effects are accounted for. ε_i is the error term.

Box table 1.3.1 shows the skills premium and the interaction effects capturing the effect of agglomeration associated with more cognitive, social, and physical skills. In all countries, workers with more cognitive skills earn more. On average, a one standard deviation increase in the cognitive skills index is associated with a 20 percent increase in the nominal wage.¹ Social skills also tend to be positively associated with wages, albeit to a lesser extent. Agglomeration does not seem to reinforce the positive effect of soft skills on wages in these countries studied.

Box table 1.3.1 Ordinary least squares estimates of the effect of agglomeration and soft skills

Item	African countries			Comparator countries		
	Kenya	Ghana	Vietnam	Colombia	Armenia	Georgia
Capital city	0.018 (0.052)	0.022 (0.116)	0.133** (0.052)	0.018 (0.060)	0.225*** (0.063)	0.316*** (0.062)
Cognitive skills index	0.224*** (0.039)	0.193 (0.125)	0.180*** (0.044)	0.216*** (0.042)	0.133*** (0.047)	0.198*** (0.050)
Cognitive skills × capital	0.043 (0.061)	0.040 (0.114)	0.021 (0.050)	-0.068 (0.060)	-0.072 (0.053)	-0.025 (0.078)
Social skills index	0.096*** (0.031)	-0.008 (0.069)	0.098*** (0.031)	0.052 (0.036)	0.080* (0.046)	0.039 (0.046)
Social skills × capital	0.044 (0.055)	0.142 (0.122)	-0.059 (0.046)	0.034 (0.057)	-0.134* (0.068)	-0.015 (0.061)
Physical skills index	-0.032 (0.031)	0.036 (0.078)	-0.043 (0.032)	-0.052 (0.039)	0.008 (0.041)	-0.082 (0.054)
Physical skills × capital	0.020 (0.045)	0.070 (0.102)	0.050 (0.039)	-0.023 (0.063)	-0.076 (0.065)	0.060 (0.073)
Years of education	0.021*** (0.007)	0.012 (0.024)	0.045*** (0.008)	0.014 (0.010)	0.005 (0.013)	0.027** (0.012)
Constant	6.789*** (0.697)	0.221 (0.673)	3.851*** (0.495)	10.316*** (0.348)	0.880* (0.453)	0.064 (0.711)
Occupation dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2108	763	2102	1635	895	634
R ²	0.44	0.36	0.34	0.43	0.37	0.61

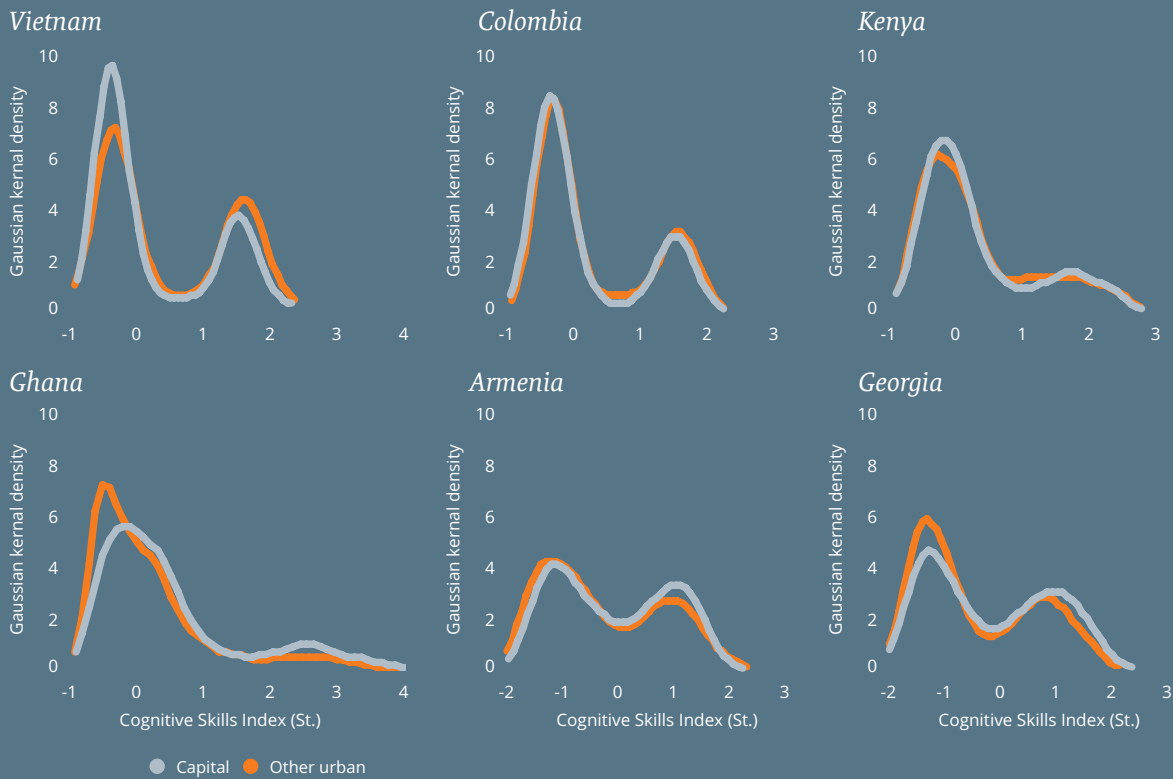
Source: Based on the World Bank STEP Skills Measurement Program.

Note: The dependent variable is the log of weekly earnings. Standard errors are clustered by worker. All regressions control for gender, age and its square, marital status, firm size, and the number of tasks performed. Robust standard errors are in parentheses.

*** statistically significant at the 1 percent level, ** statistically significant 5 percent, * statistically significant at the 10 percent level.

FIGURE 1.12

Cognitive skills of most urban workers are limited, especially in Africa



Source: Based on the World Bank STEP Skills Measurement Program.

Note: The x-axis shows a standardized cognitive skills index. A Gaussian kernel density curve captures the density of the index distribution on the y-axis.

Africa's cities are crowded, and they lack the structures need to make them livable. They are not more densely populated than cities elsewhere, but more of their people live in slums.

Concentrated urban populations should enjoy economic benefits from firm clustering, agglomeration, and productivity. Instead, in Africa they endure substandard living conditions, because cities are not dense with economic activity and structures and capital levels are low (low building stock values, poor shelter and infrastructure amenities, and low worker skills).

One reason Africa's city perform poorly is that Africa is poorer than other regions were at comparable stages of urbanization. As a result, housing investment lags such investment in low- and middle-income economies elsewhere, and cities are relatively unbuilt.

Also important are the relatively high concentrations of economic density within African cities. Urban workers crowd into informal settlements near the city center in order to access job opportunities not found elsewhere. The lack of economic density outside downtown districts can be seen, literally, in the low intensity of nighttime lights.

Poverty itself is not the problem, however: It locks cities into low development traps only if cities are spatially dispersed and disconnected, unable to attract investment with efficiencies from agglomeration. Even poor cities can become livable when they are developed in a more integrated manner, as chapter 2 shows.



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