

Chapter 2:

Scenarios of Urban Futures: Degree of Urbanization



Quick facts

1. Global city population share doubled from 25 per cent in 1950 to about 50 per cent in 2020; it is projected to slowly increase to 58 per cent over the next 50 years.
2. Between 2020 and 2070, the number of cities in low-income countries will increase by 76 per cent, in high-income and lower-middle-income countries by about 20 per cent, and in upper-middle-income countries by 6 per cent.
3. Over the next five decades, growth in city land area will mostly take place in low-income (141 per cent), lower-middle-income (44 per cent) and high-income countries (34 per cent). Changes in upper-middle-income countries are projected to be relatively small (13 per cent).
4. Small cities cover almost half of city land (about 45 per cent) in low-income countries, a trend that will persist over the coming decades.

Policy points

1. City densities in low-income countries need to be planned for and managed in ways that future growth does not exert pressure on existing open land, infrastructure and services, and result in crowding on the one hand or lead to unsustainable sprawl on the other.
2. Enhanced planning capacities for small cities and emerging newer cities will strengthen the important role they play across the urban-rural continuum in achieving sustainable futures.
3. Planning for age-friendly cities and towns that afford good quality of life for all inhabitants across all generations is critical for sustainable futures.
4. Effective urban and territorial planning is critical to mitigate the negative social, economic and environmental associated with future urban growth.



One of the fundamental challenges linked to monitoring global urbanization trends and progress on the global development agendas has been the lack of a unified definition as to what constitutes “urban” and its precise measurement that can facilitate international comparability. This has largely been attributed to the differing criteria employed by countries in defining “urban” and “rural” areas—a reflection of their various perspectives as to what constitutes these types of human settlements. Understanding future scenarios of urban trends calls for a more precise measurement that allows for meaningful comparison across countries, while remaining relevant to national conceptions of urban and rural areas.

It is in this light that this chapter uses a new, harmonized and global definition of urbanization that facilitates international comparability to present scenarios of urban trends in various regions of the world. These scenarios allow us to understand the anticipated demographic and spatial changes across the urban-rural continuum in various regions as well as their drivers. This definition, known as the Degree of Urbanization, was endorsed by the United Nations Statistical Commission in 2020. It was developed by six international organizations¹ to facilitate international comparisons and complement national definitions. The monitoring of both the New Urban Agenda and the 2030 Agenda for Sustainable Development in particular stands to benefit from this harmonized definition. A detailed manual of how to apply this new definition was published in 2021.²

Chapter 1 describes urban trends based mainly on data from the United Nations World Urbanization Prospects (WUP). This chapter, on the other hand, complements the analysis in the preceding chapter by providing a different, but equally important, perspective on future trends using Degree of Urbanization and data emanating from this new harmonized approach.

The chapter begins with a short introduction to the Degree of Urbanization. It then shows how urbanization has and will change from 1950 to 2070 using a new global definition of cities, towns and rural areas. The chapter presents the drivers of urbanization in the different regions of the world, highlighting how the spatial expansion of cities and the emergence of new cities have contributed to city population growth. It reveals how cities attract young adults, but children and elderly are more likely to live outside cities. The chapter explores how the number and size of cities have been changing and the future challenges of city growth. Finally, the chapter interrogates how dense our cities should be while advancing options that enhance sustainability.

2.1. The Degree of Urbanization and Why it is Important?

Despite varying national definitions, the harmonized definition proposed by the Degree of Urbanization methodology has revealed that there is in fact a broad consensus across countries on what constitutes a large city and where the most rural areas are. However, there is a wide variation in how “towns” are defined, a discrepancy with profound implications for demographic analysis of global urbanization trends. In general, national definitions in Europe and the Americas tend to classify towns as urban, while in Africa and Asia they tend to classify them as rural. For example, in Brazil, France, Mexico and the United States, towns tend to be classified as urban, while in Egypt, India, Uganda and Viet Nam towns are often classified as rural. In some cases, this happens because the country uses a high minimum population threshold for a settlement to be considered urban. In other cases, especially where the minimum population threshold is already met, a range of other indicators or criteria applied by a country (in combination with the minimum population threshold) excludes such settlements from being officially recognized as urban. This distinction leads to only a small share of towns being classified as urban.

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It is worth noting that most national definitions with a minimum population size threshold for an urban area use a relatively low threshold. Out of the 100 countries for which the World Urbanization Prospects lists a minimum population threshold, 84 use a threshold of 5,000 or smaller. The Degree of Urbanization follows this approach and defines all settlements with at least 5,000 inhabitants as urban. However, it recommends splitting these urban areas into cities of at least 50,000 inhabitants, on the one hand, and towns and semi-dense areas, on the other hand. This captures the urban-rural continuum more accurately, as a growing number of national definitions do as well. It also means that the cities and the rural areas as defined by the Degree of Urbanization are generally classified as urban and rural, respectively, by their national definitions and that the areas that are not treated consistently by national definitions are confined to the intermediate classes: “towns and semi-dense areas.”



To better understand urban futures and their demographic drivers, it is important to move beyond the classical rural-urban dichotomy and consider the entire urban continuum.

The Degree of Urbanization also has a second-level classification that splits towns from semi-dense areas and creates three classes in rural areas: villages, dispersed rural and mostly uninhabited (Box 2.1). To better understand urban futures and their demographic drivers, it is important to move beyond the classical rural-urban dichotomy and consider the entire urban continuum.³ This reconceptualization is critical and aligns with the vision of the New Urban Agenda and SDG 11 of fostering equitable regional development across all sizes and scales of human settlements while supporting positive economic, social and environmental interlinkages in these territories. Sustainable urban futures cannot be realized using the traditional dichotomized or binary treatment of human settlements.

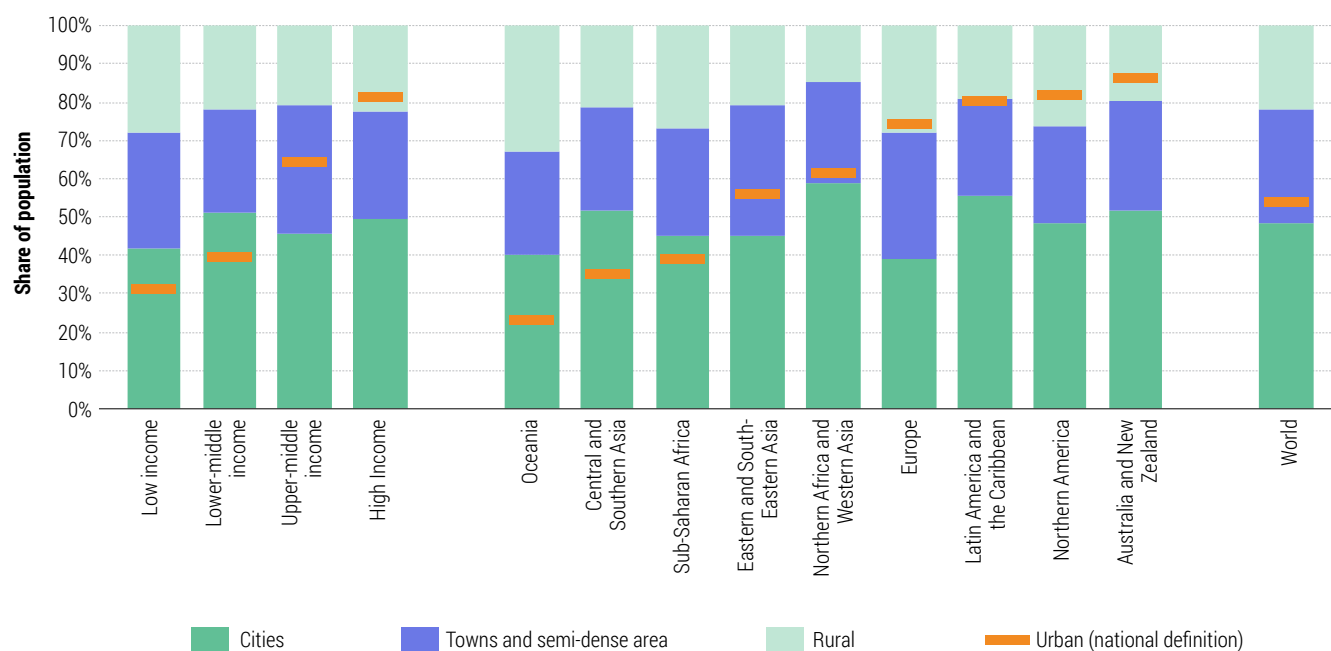
The discrepancy in how towns and other areas in the middle of the urban-rural continuum are classified by national definitions has a statistically significant impact on the global level of urbanization. For example, the world would be substantially “more urban” if all such settlements were

classified as urban. Applying this definition to an estimated global human settlements population grid (GHS-POP)⁴ for 2015 shows that in most regions the population share in cities as defined by the Degree of Urbanization is similar or smaller than the urban population share based on national definitions (Figure 2.1).

The rural population share as defined by the Degree of Urbanization is also typically similar or smaller than the national defined rural population share. In high-income countries, however, the nationally-defined rural population share is smaller than the one as defined by the Degree of Urbanization approach. This is because several of the high-income countries use a minimum population threshold below 5,000 inhabitants. For example, the US uses 2,500, Canada and New Zealand use 1,000 and Denmark and Sweden use 200.

These results highlight the broad agreement on the two categories of human settlement at the extremes as well as the disagreement with regard to the middle of the urban-rural continuum. Given the global population concentration in Asia and Africa, the global population share in nationally-defined urban areas (54 per cent) has a closer resemblance to the share of population in cities (48 per cent) than the aggregate of cities plus towns and semi-dense areas (78 per cent) as defined by the Degree of Urbanization.

Figure 2.1: Population by Degree of Urbanization and in nationally defined urban areas by SDG regions and income group, 2015



Box 2.1: Levels and classes in the Degree of Urbanization methodology

The Degree of Urbanization methodology offers more nuance than the “urban” and “rural” binary that categorizes the demographic classification of human settlements common in many national statistical offices. Instead of those two categories, the Degree of Urbanization approach proposes two levels of understanding with distinct classes of human settlement by analysing grid cells of one square kilometre (1 sq. km).

Level 1 consists of three classes:

1. **Cities:** settlements of at least 50,000 inhabitants in a high-density cluster of grid cells (greater than 1,500 inhabitants per sq. km)
2. **Towns and semi-dense areas:** an urban cluster with at least 5,000 inhabitants in contiguous moderate-density grid cells (at least 300 inhabitants per sq. km) outside cities
3. **Rural areas:** grid cells with a density of less than 300 inhabitants per sq. km or higher density cells that do not belong to a city, town or semi-dense area

Urban areas are defined as “cities” plus “towns and semi-dense areas.” It is recommended, however, to keep all three classes separate given their different nature.

Level 2 uses six classes:

1. **Cities:** same as above
2. **Towns:** settlements with between 5,000 and 50,000 that are either dense (with a density of at least 1,500 inhabitants per sq. km) or semi-dense (a density at least 300 inhabitants per sq. km).
3. **Suburban or peri-urban areas:** cells belonging to urban clusters but not part of a town
4. **Villages:** settlements with a population between 500 and 5,000 inhabitants and a density of at least 300 inhabitants per sq. km.
5. **Dispersed rural areas:** rural grid cells with a density between 50 and 300 inhabitants per sq. km.
6. **Very dispersed rural areas or mostly uninhabited areas:** rural grid cells with a density between 0 and 50 inhabitants per sq. km.

The World Urbanization Prospects also lists cities with at least 300,000 inhabitants. Comparing these designations with the cities identified by the Degree of Urbanization shows a very high overlap.⁵ This confirms that national definitions and the Degree of Urbanization agree on what constitutes a large city. However, compared to the data in the World Urbanization Prospects, the data used here has several advantages (Box 2.2). The concept of “city” and its definition here have been harmonized whereas the World Urbanization Prospects employs a mixture of city proper, urban agglomeration and metropolitan areas. Second, instead of the point locations

provided by the World Urbanization Prospects, this data set produces boundaries with a high spatial resolution. The cities are defined using a grid of one square kilometre (1 sq. km) cells. This means that city population densities can be calculated and compared in a meaningful way.

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Box 2.2: Advantages of the Degree of Urbanization methodology: A summary

The Degree of Urbanization methodology:

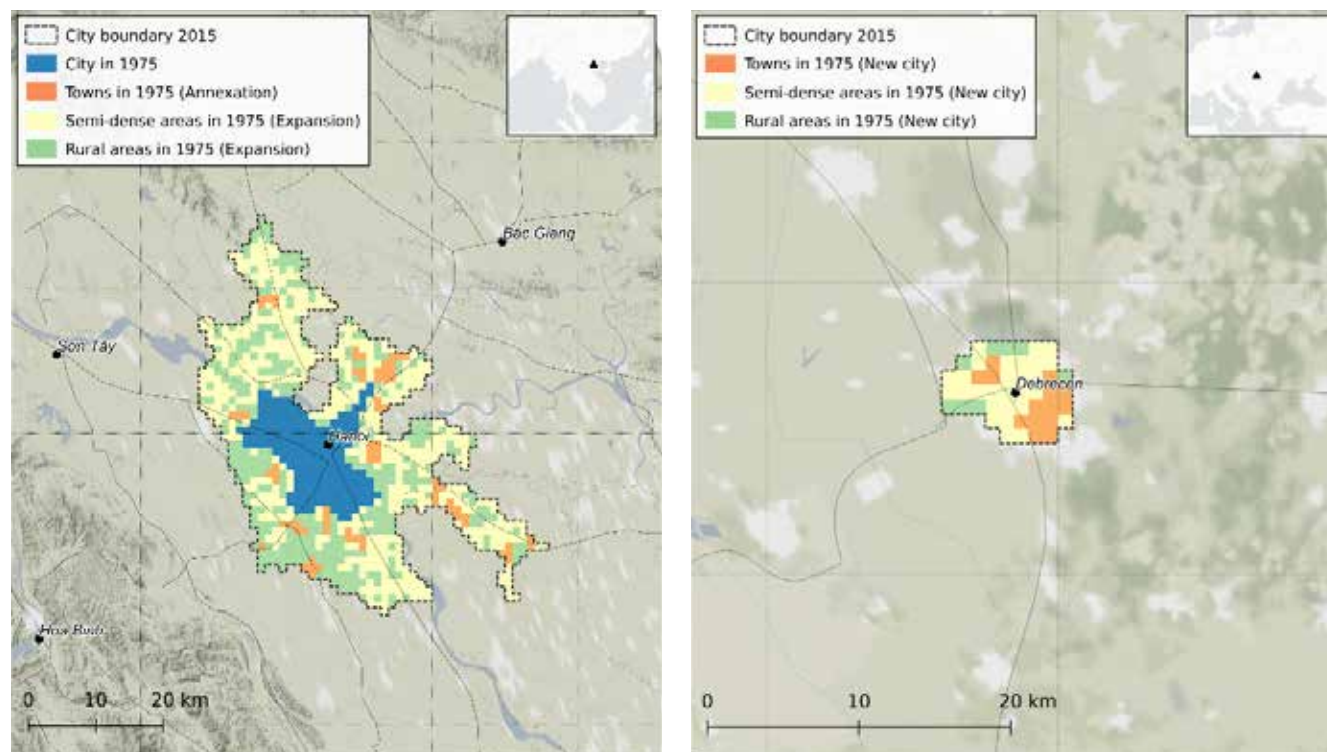
- captures the urban-rural continuum through three different classes at level 1 and through six different classes at level 2 of the methodology's classification system (Box 2.1: Levels and classes in the Degree of Urbanization methodology);
- uses the same population size and density thresholds across the world;
- starts from a population grid to reduce the bias of using spatial units with different shapes and sizes;
- measures population clusters directly instead of indirectly by using building clusters as an approximation of population clusters;
- defines areas independently from their access to services to ensure that this access can be monitored reliably, in other words, without interference from the definition;
- proposes a relatively cost-effective approach that can be applied to existing data collections.

Source: European Union et al, 2021.



Aerial view of Barcelona, Spain © Shutterstock

Figure 2.2: City population growth through expansion, annexation and new cities in Hanoi, Viet Nam and Debrecen, Hungary



Source: Adapted from UNDESA, 2001.

As a city expands, it incorporates the population of the surrounding rural and semi-dense areas and can annex nearby towns (Figure 2.2a). When a town grows, it can pass the minimum population threshold and become a new city (Figure 2.2b). In both cases, the total population has grown, but the initial population of the rural and semi-dense areas as well as the towns are merely reclassified. This population was already there before the city expanded or became a new city. Measuring the impact of reclassification separately is a longstanding United Nations recommendation.⁶ Previously, this task has been difficult to achieve due to the lack of a harmonized definition and boundaries with a high spatial resolution. This chapter, however, looks at the impact of reclassification in subsequent sections.

Generally, the high growth rates of urban population in the World Urbanization Prospects have dominated the debates on urbanization in recent decades. However, the differences between the national definitions and the unclear impact of the reclassification of areas have led to an overestimation of urban growth rates, an emphasis on challenges for megacities relative to small- and medium-sized cities, and an underestimation of the relevance of urban natural increase versus rural-to-urban migration as a source of city population growth.⁷

According to different scenarios, in particular regarding the decline of fertility rates in developing countries, the peak for global population growth could be reached between 2070 and the end of the 21st century.⁸ Apart from differences in timing, the completion of demographic transition in developing countries is expected to parallel urban transitions and lead to a convergence of urban population growth rates towards the low level already reached by highly urbanized countries.⁹

Within this general theoretical framework, the trends of urbanization in developing countries and emerging economies exhibit unique features with respect to what happened during industrialization in the 19th century. While increases in the share of urban population are only slightly higher by historical standards, developing countries are characterized by an unprecedented growth of urban population in absolute terms mostly due to their high national population growth.¹⁰

In terms of economic development, the previous two editions of the World Cities Report have highlighted the positive link between urban areas and economic development. The World Cities Report 2016 showcased urbanization as a transformative trend, with urban areas described as “a positive and potent force for addressing

sustainable economic growth, development and prosperity, and for driving innovation, consumption and investment in both developed and developing countries.”¹¹ The World Cities Report 2020 reinforced this message by stating that urban areas generate enormous economic value, although the economic value generated varies depending on the local context.¹² For instance, while the linkages between urbanization and economic growth have been apparent in Eastern and South-Eastern Asia, several authors have highlighted that the relationship between urbanization and economic development has decoupled in Sub-Saharan Africa, citing several reasons e.g. widespread neglect and bad management of cities, among other factors.¹³

In relation to environmental sustainability, the World Cities Report 2020 notes that urbanization, if unplanned or unmanaged, presents threats such as “unbridled urban sprawl, irreversible land-use changes and biodiversity loss, resource and energy-intensive consumption patterns, and high levels of pollution and carbon emissions.” In the same vein, Chapter 5 of this Report stresses the threat posed by the twin crises of climate change and the loss of global biodiversity to the

future of cities. In relation to climate change, for instance, the IPCC points out that the resulting sea-level rise—which is expected to significantly increase by the end of this century—poses risks to high-density coastal urban developments in both developing and developed countries.¹⁴



Metro Manila, Philippines © Shutterstock

Box 2.3: Projections and data sources for the Degree of Urbanization methodology

The projections presented in this chapter produce different estimates of urban and rural population as compared to national definitions for two main reasons. First, some national definitions include medium-sized settlements or towns in the urban category, while others categorize them as rural. The Degree of Urbanization classifies these settlements into its own category: “towns and semi-dense areas.” The second reason is that the projections of population by Degree of Urbanization are not derived from an extrapolation of the trends of rural and urban population aggregated at the national level, as normally done in the United Nations *World Urbanization Prospects*,¹⁵ but from a bottom-up approach starting at the grid cell level.

With the Degree of Urbanization approach, urbanization is not predetermined from national trends but emerges from a gravity model that reflects the surrounding and attractiveness of each grid cell. The parameters used in this model have been estimated for different regions of the world and are based on changes in population and built-up area grids between 1975 and 2015.

Since the population by Degree of Urbanization is based on geographically-detailed data, it is possible to do a more detailed analysis. The Degree of Urbanization can be applied at multiple points in time, which makes it possible, for example, to measure the impact of expansion and densification separately for each city.

In terms of data sources, the projections and trends in this chapter rely on three distinct data sets. For the period 1950 to 1975, the population by Degree of Urbanization has been estimated by combing data based on national definitions from the *World Urbanization Prospects* and estimates of the population by the Degree of Urbanization for 1975 produced by the European Commission’s Joint Research Centre (JRC). From 1975 to 2015, the data relies global estimated population grids for 1975, 1990, 2000 and 2015 produced by the JRC. The data from 2015 to 2070 relies on projected population grids produced by Jones et al. (2020). The national population projections are derived from the Shared Socioeconomic Pathway 2: Middle of the Road scenario as prepared by the International Institute for Applied Systems Analysis (IIASA).

2.2. City Population Continues Growing as Towns and Rural Areas Experience Slowdown

Urbanization undoubtedly presents a unique opportunity for social and economic progress.¹⁶ On the other hand, as highlighted in Chapter 1, it also presents challenges when planning systems and public institutions are not equipped to deal with the challenges posed by rapid urbanization. Rapid population growth in cities, for instance, can lead to congestion and crowding when it is not anticipated with adequate infrastructure and housing and when the expansion of the city is not properly planned and managed. As a result, the population growth in cities, especially rapid growth, is a central concern as humanity moves into a future that is predominantly urban.

Uncovering some of these demographic trends using a harmonized global methodology that captures the urban-rural continuum in a consistent manner is therefore fundamental. In this regard, this section applies the Degree of Urbanization to briefly examine the demographic trends of the three classes of settlements that comprise Level 1 in Box 2.1. It provides a synopsis of previous decades before venturing into future projections of what is expected to unfold until 2070. Similarly, using this harmonized data, it peeks into future anticipated land-cover changes.

Over the past seven decades, the world has experienced significant population growth and notable demographic “megatrends,” including urbanization, which have significant implications for economic and social development as well as environmental sustainability.¹⁷ In 1950, the global population was relatively small at only 2.5 billion and mostly rural. By 2020, the global population had grown to 7.8 billion and most people lived in cities. This transformation has had big economic, social and environmental consequences which various chapters of this report examine with a view to achieving sustainable futures.

In 1950, most people lived in rural areas, followed by towns and semi-dense areas, while cities were the least inhabited. Faster growth in city population meant that by 1965, the global population was equally distributed across these three types of areas (Figure 2.3). By 1990, the order had reversed with most people living in cities, followed by towns and semi-dense areas, and then rural areas last. In 2020, almost half the global population lived in cities, while 29 per cent lived in towns and semi dense areas and 22 per cent in rural areas.

However, this large transformation is projected to slow into the future. Demographic growth has already started to decelerate and is projected to continue to do so over the coming decades. The share of population in cities is projected



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Notably, the population in towns and semi-dense areas has generally grown at the same speed as the total population between 1950 and 2020. As a result, it has maintained its population share of 30 per cent over that period, but the absolute number of people in these areas tripled from 750 million to 2.25 billion. The population in these settlements is projected to continue growing, but more slowly than the total population. Between 2050 and 2070, however, population in towns and semi-dense areas will start declining.

The rural population, on the other hand, has grown more slowly than total population from 1975 to 2020. This growth is projected to continue to slow down until 2050, after which a slight decrease in absolute numbers is expected. As a result, its population share has dropped from 38 per cent in 1950 to 22 per cent in 2020 and to 18 per cent in 2070.

In terms of geographic regions, data from the Degree of Urbanization shows Sub-Saharan Africa and Oceania to be having the lowest city population share in 1950 (Figure 2.4). These two regions—together with Northern Africa and Western Asia—are projected to experience the biggest increase in the city population share in the future. On the other end of the spectrum, Europe will experience the smallest increase in its city population share among the regions. In most regions, the population share will drop in both rural areas as well as towns and semi-dense areas. In the Americas, Europe, Australia and New Zealand, however, the population share in towns and semi-dense areas barely changes over time.

Figure 2.3: Evolution of population by degree of urbanization 1950–2070 in absolute and relative terms

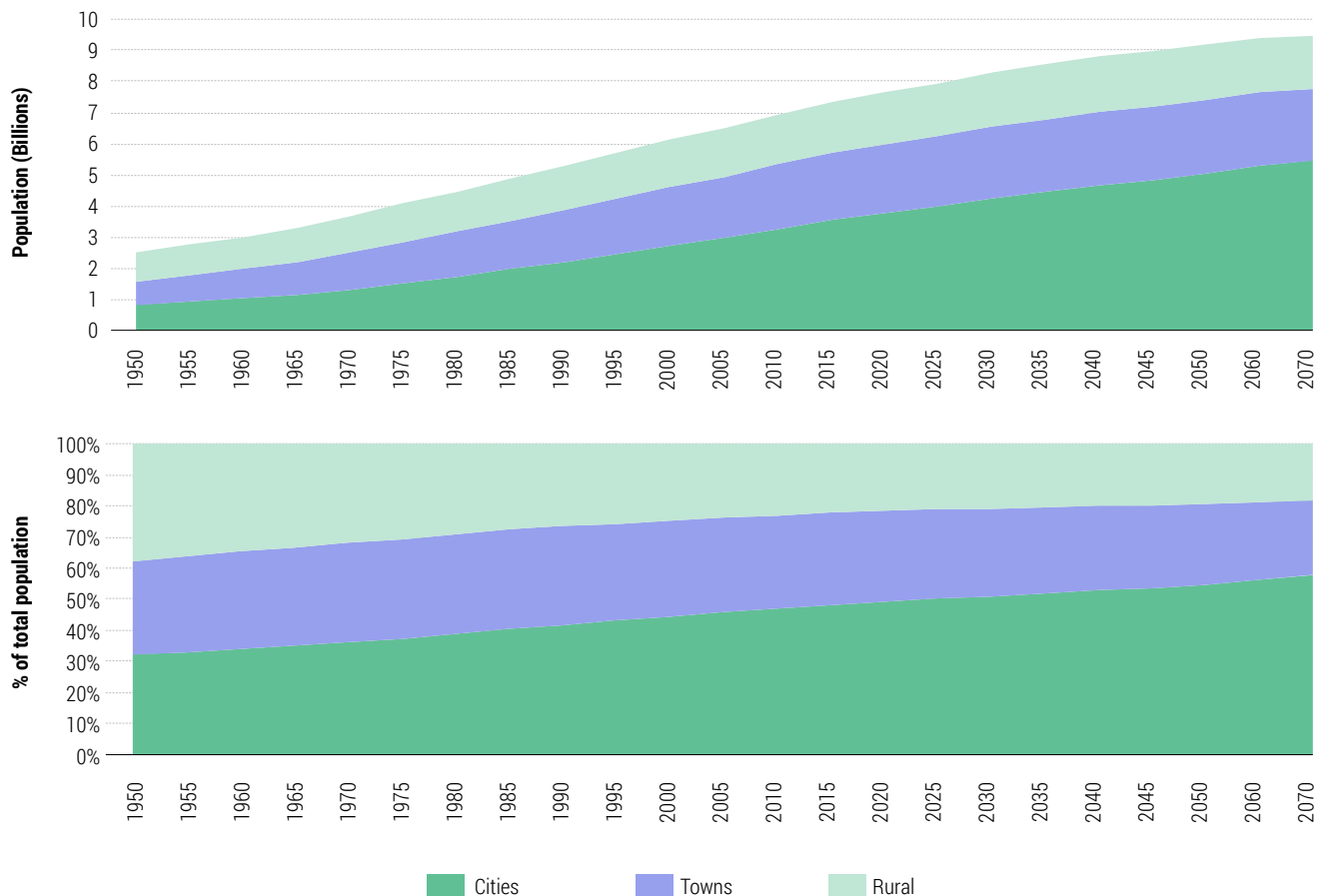
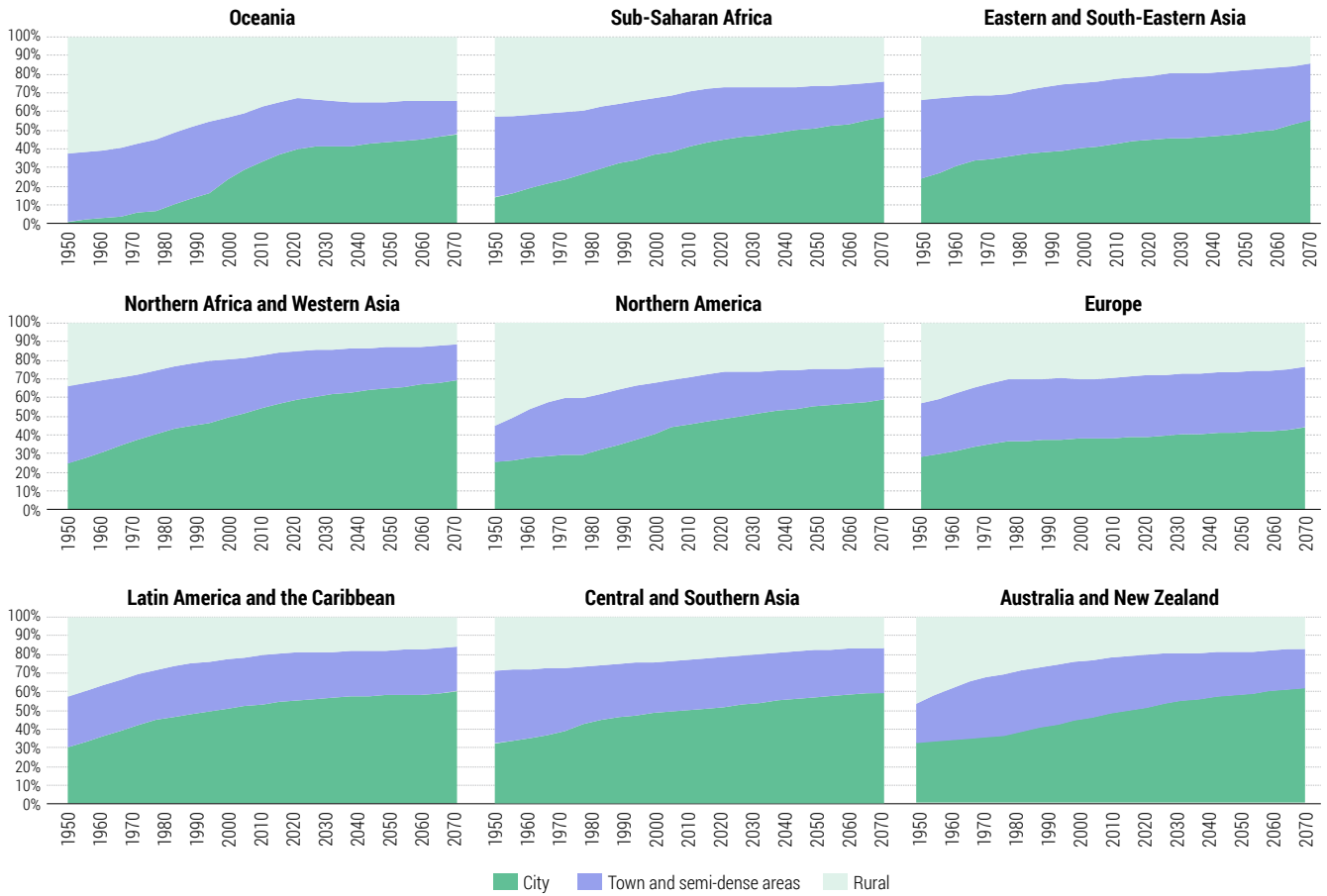
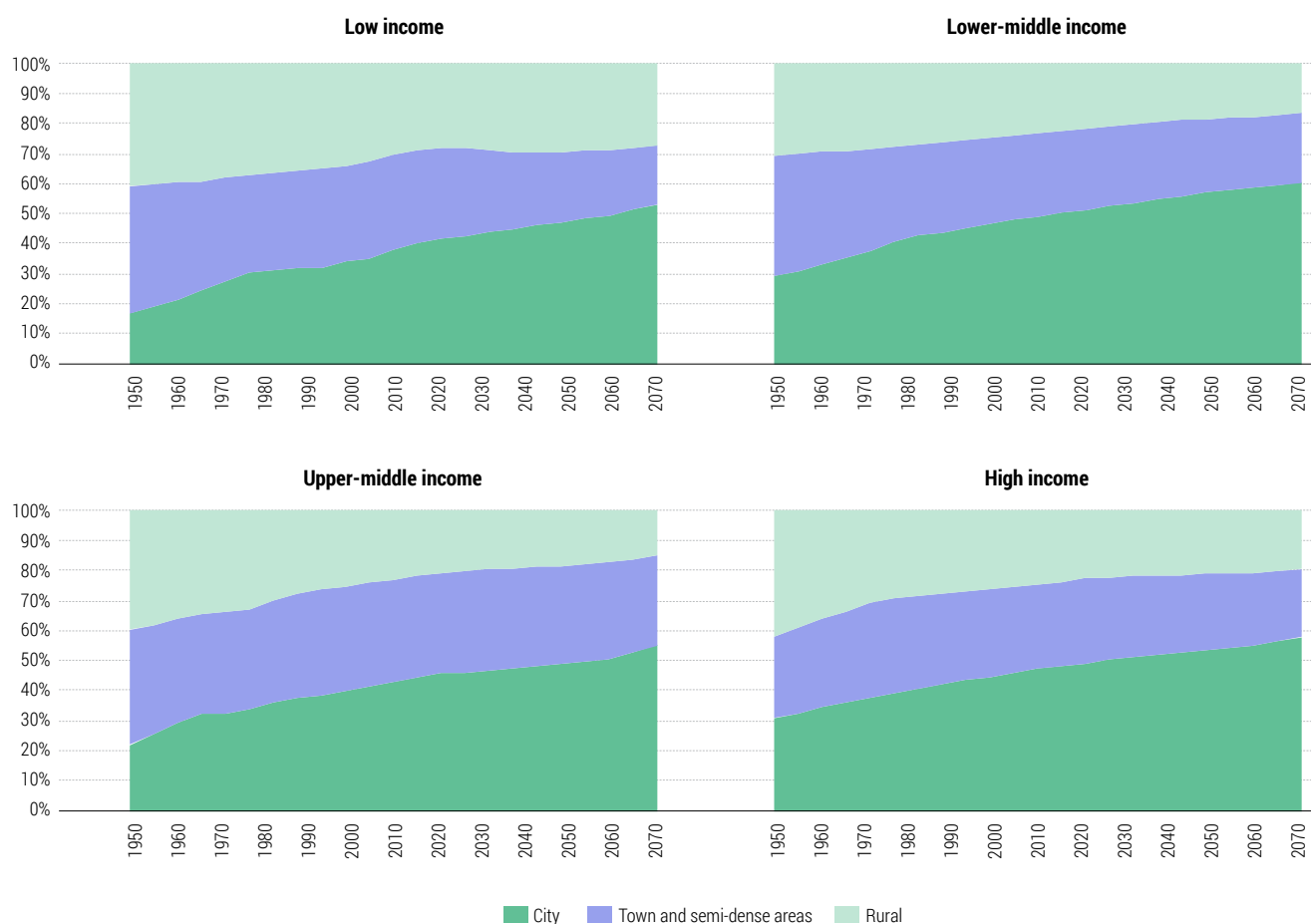


Figure 2.4: Population share by degree of urbanization and SDG region (1950–2070) ordered by city population share in 1950



Nairobi, Kenya © Kirsten Milhahn/UN-Habitat

Figure 2.5: Population share by degree of urbanization and income level (1950–2070)

When these demographic changes are assessed in terms of income groups, the data show that low-income countries had the smallest share of city population (17 per cent) in 1950, while high-income countries had the highest share (31 per cent). Because city population shares in low-income countries increased faster than in high-income countries, this gap has shrunk from 14 to 7 percentage points and is projected to drop to 5 percentage points by 2070 (Figure 2.5).

Over the past decades, population growth rates in lower-income countries have been higher than in other countries. This trend is expected to continue. By contrast, high-income countries have had relatively low population growth rates, which are projected to slow further and reach almost zero by 2070. Upper- and lower-middle-income countries have also experienced higher growth rates in the past decades, but they are also slowing down. The population of upper-middle-income countries is even projected to shrink from 2040 onwards.

The growth of population in cities, towns and semi-dense areas invariably leads to spatial expansion. Past studies have shown urban land area growing at a higher rate than population and, relatedly, population densities have also been declining as a result of more dispersed patterns of urbanization in the form of urban sprawl.¹⁸ These trends significantly affect the environment and have profound socioeconomic repercussions. These effects include negative impacts on ecosystem services and increased energy consumption, higher cost of providing infrastructure (often leading to the uneven or unequal distribution of services), a

sustainable futures call for slowing down urban sprawl and, if possible, ensuring that the compactness of cities is maintained or increased over time in line with Target 11.3 of SDG 11

reduction in the economies of agglomeration and decreased urban productivity, among others. Yet, sustainable futures call for slowing down urban sprawl and, if possible, ensuring that the compactness of cities is maintained or increased over time in line with Target 11.3 of SDG 11—which also provides a measure of how efficiently cities “utilize” land.¹⁹

The Degree of Urbanization shows that the share of land occupied by cities is small (0.5 per cent in 2020), but has been growing (from 0.2 per cent in 1975) and is projected to keep growing (to 0.7 per cent in 2070) (Figure 2.6). In contrast, land covered by towns and semi-dense areas double between 1975 and 2020, but it is projected to start shrinking from 2040 onwards due to conversion to city and rural land. This projection also indicates that the amount of urban land is likely to shrink after 2050.

City land in low-income countries has been growing rapidly and is projected to more than double between 2020 and 2070 (Figure 2.7). Additionally, land covered by towns and semi-dense areas in low-income countries is projected to grow, but at a slower pace (+50 per cent between 2020 and 2070). In contrast, upper-middle-income countries are projected to experience the slowest increase in city land (+10 per cent between 2020 and 2070) and land covered by towns and semi-dense areas is likely to shrink, in part due to their shrinking population. Urban land in lower-middle- and high-income countries is projected to grow, but the pace slowing over time to reach almost zero between 2060 and 2070.

2.3. What is Driving Population Growth in Cities?

The previous section and Chapter 1 show that urbanization is pervasive although the level, pace and processes driving urbanization are uneven across the world. The previous sections of this chapter have also described nuanced trends along the urban-rural continuum based on the classes in new global definition (“cities,” “towns and semi-dense areas” and “rural areas”). This section delves into the most distinct and unique pattern emerging at the global level that carries significant implications for urban futures: population growth in cities.²⁰

Depending on how it is managed, population growth in cities can contribute to sustainable urban futures and deliver on the optimistic scenario described in Chapter 1 by increasing economic productivity, spurring innovations and new ideas that enable people to find a better job and better access to services. On the other hand, if this growth is not planned for and well-managed, it can exacerbate poverty and inequality (increasing the population of slums or poorly-served neighbourhoods), compound environmental problems and



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Figure 2.6: Land covered by cities, towns and semi-dense areas, 1975–2070

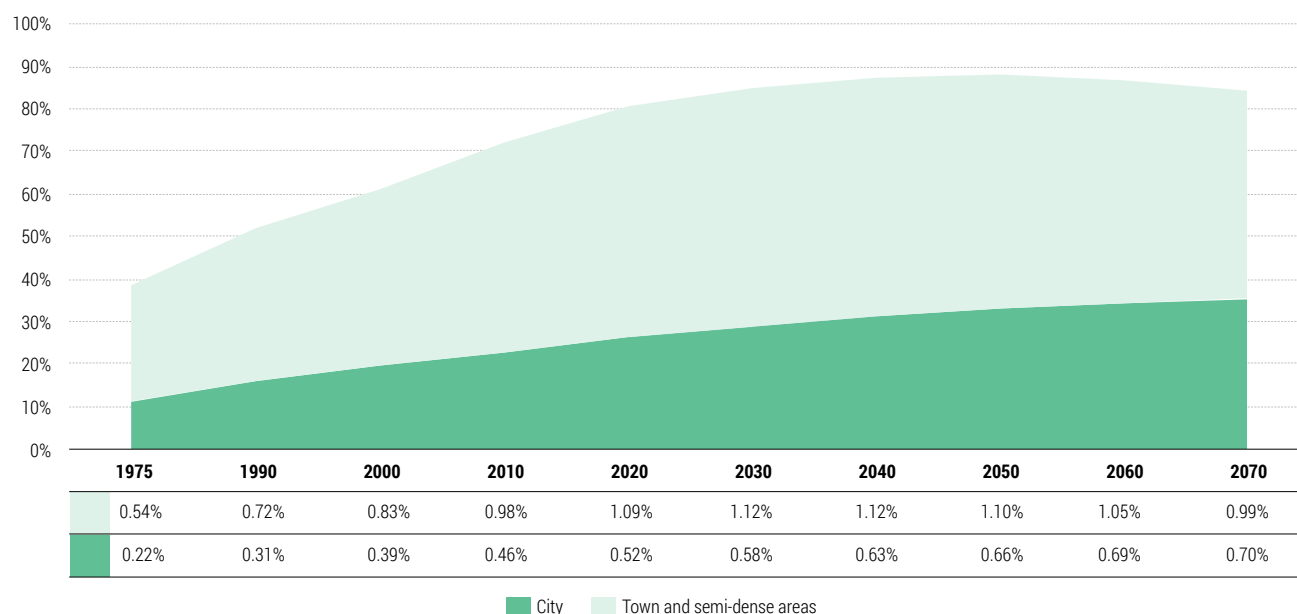
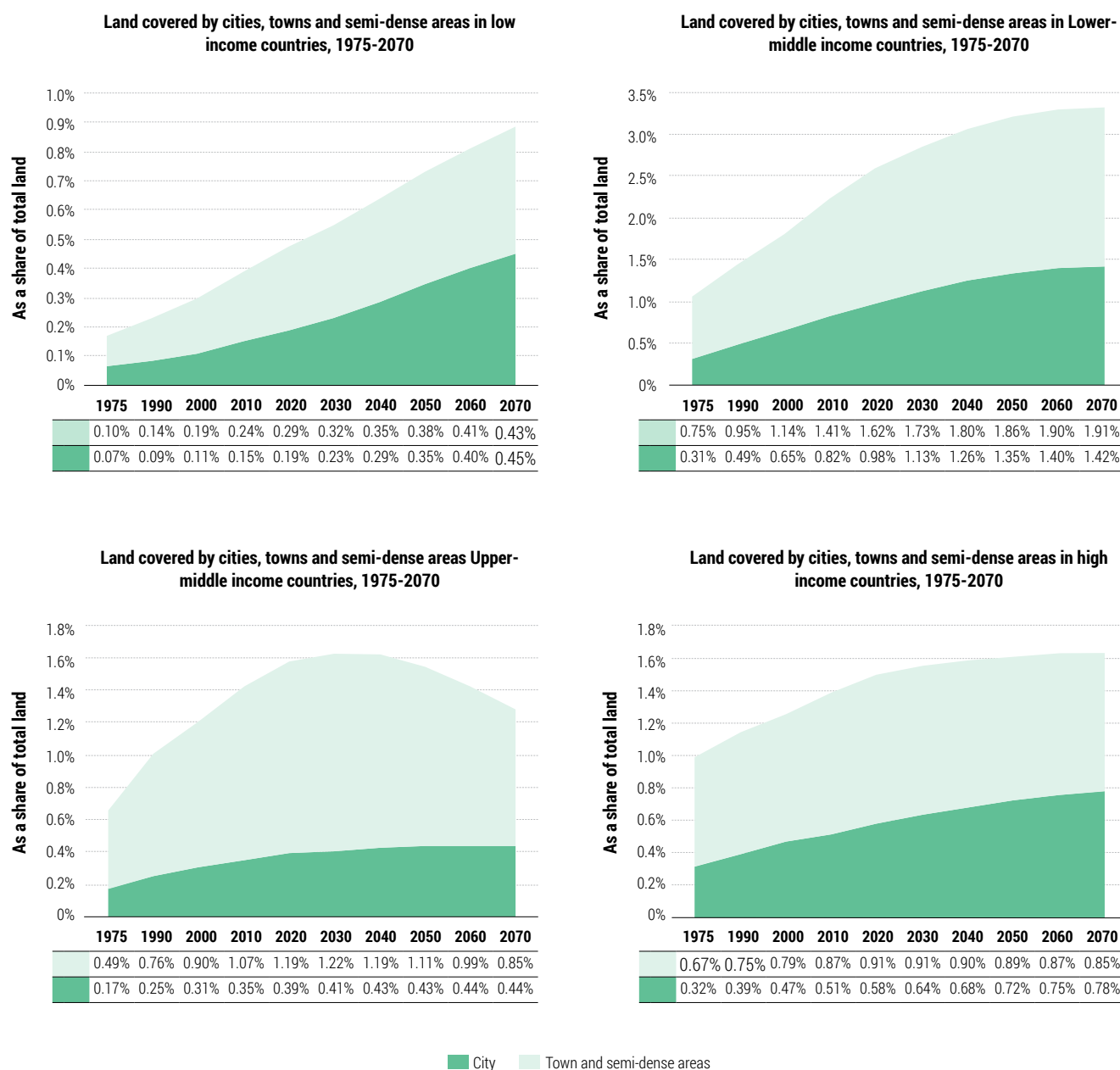


Figure 2.7: Land covered by cities, towns and semi-dense areas and income group, 1975–2070


pose challenges to the achievement of net-zero goal, thus leading to the pessimistic or even high damage scenarios described in Chapter 1. As a result, this section, using new data from the harmonized definition of cities in the Degrees of Urbanization approach, revisits the drivers of city population growth, including the questions of how cities expand, how new cities emerge and how the age of a city's population differs from those in the rest of the country.

2.3.1. Natural growth is the main driver of city population growth

Several studies have warned about the frequent overestimation of the role of rural-urban migration in the rapid urban growth recorded in last decades in particular in Sub-Saharan Africa.²¹ Despite using different methodologies to understand the demographic drivers of urban growth, these studies generally agree that about 60 per cent of the

urban population increase is attributable to natural growth and the remaining 40 per cent is due to the combined effect of migration and reclassification of areas. Because most of the growth in city population is due to natural change and expansion, restricting migration into cities would have relatively little impact.²²

These warnings and estimates are confirmed by the analysis of city population growth over time (Figure 2.8). In lower-middle- and low-income countries, city population growth is mainly determined by natural change (captured in the fixed share component, see Box 2.4). The influence of city-to-rural migration (captured by the change in share component) has been dropping over time and is projected to continue to do so. For example, between 2060 and 2070, the city

population in low-income countries is projected to increase by 12 per cent. Two-thirds of this increase (8 per cent) stems from natural change (fixed share) and only one-third from rural-to-city migration (change in share).

In high-income countries, both components (fixed share and change in share) contribute equally to growth, and both are shrinking over time. In upper-middle-income countries, the contribution of the natural change (fixed share) is decreasing at a faster rate than rural-to-city migration (change in share) and becomes negative after 2040. This decline is because the national population is projected to shrink from 2040 onwards and only the rural-to-city migration ensures that city populations continue to grow.

Box 2.4: Different drivers of population change

National population change is often broken down into “natural change” (the difference between the numbers of births and deaths) and “net migration” (the difference between in-migration and outmigration). At the national level, this natural change and international net-migration data are usually available. Measuring population change at the city level, however, is more complicated. At the city level, net migration has to consider both international and internal migration. Data is usually not available for natural change at the city level. Finally, the boundaries of a city can change over time, leading to a reclassification of population. As a result, this chapter splits population growth in two different ways.

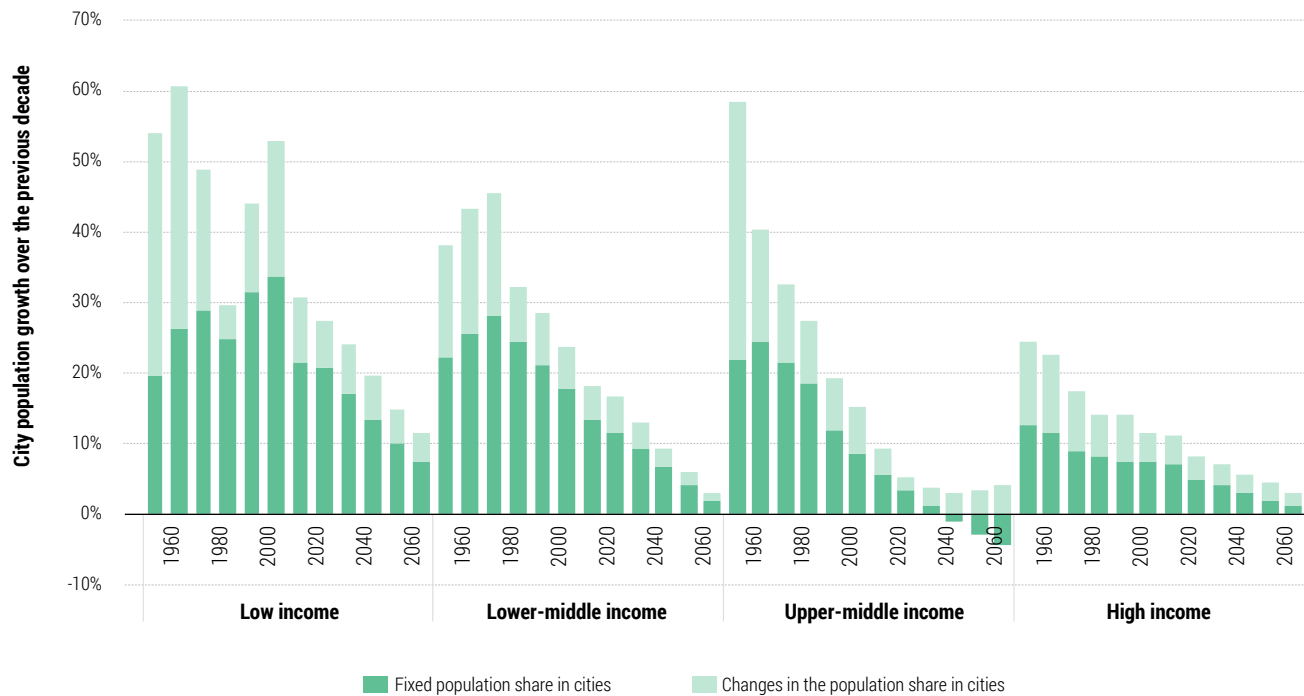
City population growth can be split into two components based on the changes in the city population share:

- **Fixed share** shows how much the population of a city would grow if its share of the national population remained fixed. This would be the case if it had the same natural change and net-migration rate as its country did. In lower-income countries, this will primarily be driven by natural change.
- **Change in share** shows how much the population of a city grows because its share of the national population changed. This share can grow due to net migration, expanding city boundaries and differences in natural change. In lower-income countries, this will be mainly driven by rural-urban migration.

City population growth can also be split into change and reclassification:

1. Population change:
 - i. Within the initial boundaries of the city.
 - ii. Within areas that are newly classified as a city.
2. Reclassification: Initial population in areas that are newly classified as (part of) a city.
 - i. Expansion: Rural, suburban and peri-urban areas that have been added to a city.
 - ii. Annexation: A town is added to a city.
 - iii. A new city: An area, typically a town or village, grows enough in population and density to be classified as a city.

Figure 2.8: Components of city population growth, 1960–2070



2.3.2. Expanding cities and new cities

One important, and often ignored, driver in expansion of city population is represented by the changes in the classification of an area. So far attempts to explicitly account for the role of reclassification in explaining urban growth have been hindered by the lack of harmonization in the definitions and the absence of detailed boundaries. However, with the new definitions and by using spatial methods applied on population grids, some studies have started to demonstrate how this role is far from being negligible.²³

As population grows, some areas originally classified as towns or rural areas are reclassified as cities and their population starts to contribute to city population growth. The other sources of city population growth are natural change and migration. By applying the classification by Degree of Urbanization at multiple points in time, the impact of the change in classification for each cell can be captured and aggregated. Overall, the spatial expansion of cities and the emergence of new cities are projected to contribute between 20–40 per cent of the growth in city population. However, as highlighted in the previous subsection, most population growth in cities is due to natural change (fixed share) and most of that growth will occur within the initial boundaries of a city, while reclassification will add less and less to city populations (Figure 2.9).

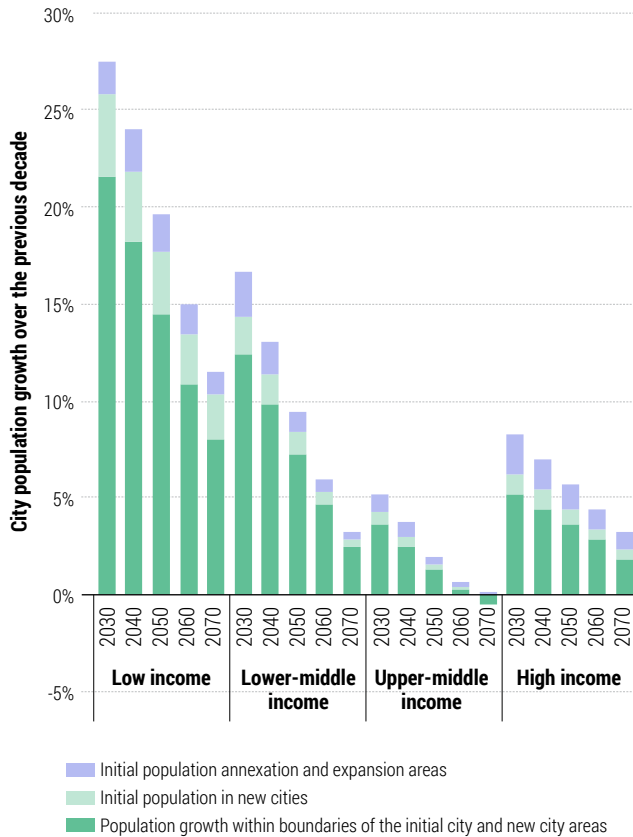
Most new cities will be towns that have grown to attaining the threshold for “city” classification as per the Degree of Urbanization harmonized definition. The contribution of these reclassifications is higher in low-income countries and leads to a 5 per cent increase city population per decade. Further, from the spatial analysis using the Degree of Urbanization approach, the transformation of a rural area directly to city can also be observed in low-income countries. This phenomenon, however, does not happen in countries with higher incomes.

In high-income countries, new cities will be rare. Between 2060 and 2070, new cities are projected contribute to increase the city population by only 0.5 per cent. In contrast, in low-income countries the emergence of new cities between 2060 and 2070 is projected to increase the city population by 2.3 per cent. The emergence of new cities of small size poses challenges in terms of urban governance for low-income countries. The previous World Cities Reports



the spatial expansion of cities and the emergence of new cities are projected to contribute between 20–40 per cent of the growth in city population

Figure 2.9: The role of reclassification in city population growth during the previous decade, 2030–2070



To realize sustainable urban futures, an integrated and territorial approach to urban development is imperative

To realize sustainable urban futures, an integrated and territorial approach to urban development is imperative. Various levels of government can develop and implement national urban policies and strategies that ensure integrated spatial growth and development to harness the potential of such small and intermediate cities within national urban systems. These settlements offer a significant, but often untapped, potential for achieving the Sustainable Development Goals and contributing to sustainable futures. The poor data and information on these cities pose severe challenges for evidence-based policy formulation. For instance, the lack of sufficient geographic detail and of a harmonized definition makes it impossible to unpack the specific components of urban growth.

In low-income countries, expansion and annexation account for a relatively small share of city population growth and the high growth rates are mainly driven by population growth within the initial city boundaries and the new city areas (Figure 2.10). On the other hand, expansion and annexation are more important in high-income countries because cities

have highlighted the plight of secondary or intermediary cities in most countries. Often, these cities face challenges in managing urbanization. They struggle to attract investments; generate employment; and meet the demand for housing, infrastructure and basic urban services.²⁴



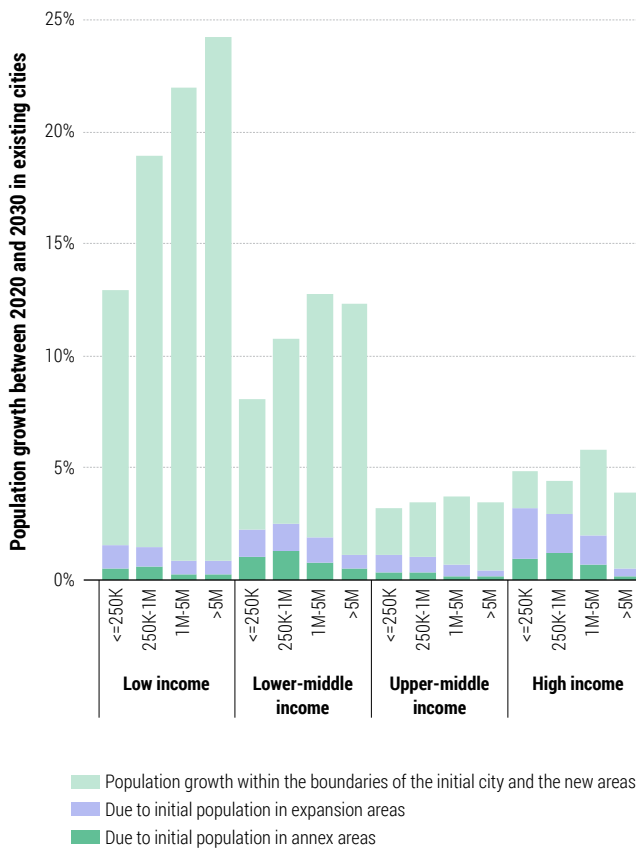
asymmetrical development compounds the urban spatial divide

Despite these challenges, policy discussions on urbanization have been dominated in the past by their attention on the unprecedented growth of megacities and large cities. As illustrated in Chapter 4, the “winner-takes-all” phenomenon propels megacities and large cities to growing economically faster than others creating more localized development as opposed to allowing more diffused spatial development across territories. Such asymmetrical development compounds the urban spatial divide, especially with regard to secondary cities—whose populations, especially in regions such as Sub-Saharan Africa, often face multiple deprivations relating to income and employment, water and sanitation, health and housing.²⁵



Medellin, Colombia © Kirsten Milhahn/UN-Habitat

Figure 2.10: City population growth between 2020 and 2030 by city size, income group and source of growth



tend to be surrounded by larger suburbs, which are absorbed by the city as it expands. This tendency is particularly the case for small cities, where the population of the surrounding suburbs is more important relative to the city population than is the case for larger cities.

2.3.3. Cities attract more young adults, while rural areas have more children

In the rural areas of low- and lower-middle-income countries, children as a share of the rural population is higher than the share of children in the city population (Figure 2.11). These higher shares reflect the higher fertility rates in rural areas which is documented in several analyses based on Demographic and Health Survey data.²⁶ Between 1950 and 2050, the slopes

of the lines for children do not change substantially, but tend to shift downwards. This indicates an overall reduction in the share of children at the country level, but illustrates no fundamental changes in rural/city differences.

In upper-middle-income countries, a reduction of the intercept between 2050 and 2000 shows the effect demographic transition in terms of changes of overall age structure at national level. This change is also accompanied by a flattening of the lines, which indicates that rural areas are converging towards the lower fertility and mortality levels found in cities.

While differentials in age structure for the age groups of children can be mainly attributed to fertility and mortality, differences in other age groups stem both from cohort effects (population residing in the areas moving to the next age group) and migration patterns which can also have a strong age component.²⁷

In all income groups, the slopes invert from positive to negative when moving from children to young adults’ cohorts. This inversion indicates that cities attract more younger adults relative to towns and rural areas. In low-income countries, the slopes are more pronounced and the inversion is anticipated to the age group 15–19. For high-income countries, the negative slope starts at age 20 in correspondence with migrations of students to cities for tertiary education.

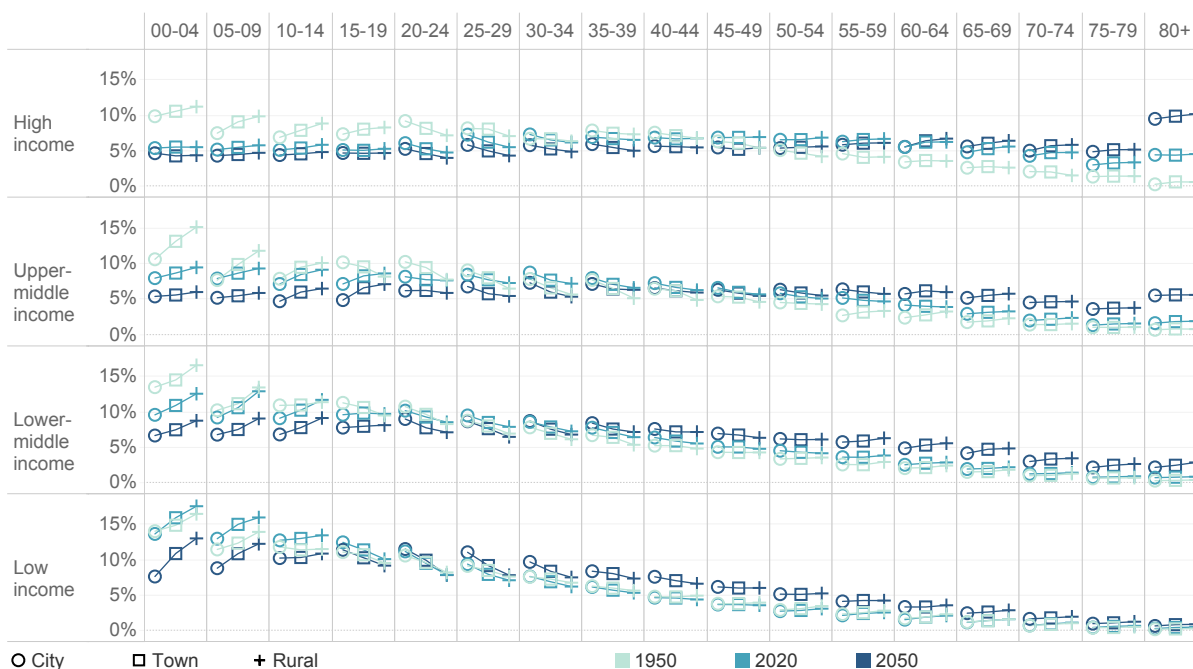
Another inversion that can be observed after age 50, particularly in high-income countries, denotes how population ageing is affecting rural areas. This trend is likely attributable to migrations from cities to rural areas in correspondence with retirement. Differentials in age distribution between cities, towns and rural areas have implications both for the ageing of population in countries in advanced stages of their demographic transition and for countries with still high fertility rates and large youth populations.

Overall, the large share of youth population in cities is expected to persist. If accompanied by favourable conditions, large youth bulges concentrated in cities of developing countries represent the source of a demographic dividend. In the absence of such conditions, they pose several demographic and socio-economic challenges. Provided there are sufficient employment opportunities, a large youth population frees up resources for investments and boosts productivity.²⁸ This positive effect holds true irrespective of the level of income and geographical area. Where employment opportunities are lacking, youth bulges may be a source of unrest, violence and conflicts.²⁹



In the rural areas of low- and lower-middle-income countries, children as a share of the rural population is higher than the share of children in the city population

Figure 2.11: Population share by age group in cities, towns and semi-dense areas, and rural areas in 1950, 2020 and 2050



Note: This graph shows the population share for five-year age groups by Degree of Urbanization for three points in time. The data points of the three classes of the Degree of Urbanization are connected by a line. A line with an upward slope means that a higher share of that age groups lives in rural areas as compared to cities. A line with a downward slope means that a higher share of that age group lives in cities as compared to rural areas.

2.4. Growth in Cities is Slowing Down, but Less for Large Cities

More than a decade ago, the UN-Habitat flagship report State of the World Cities 2008/09 described cities as “one of humanity’s most complex creations, never finished, never definitive. They are like a journey that never ends. Their evolution is determined by their ascent into greatness or their descent into decline. They are the past, the present and the future.”³⁰ The analysis of previous and anticipated future trends using the harmonized definition of cities provides an insight into this evolution of cities in a coherent way. As alluded to in previous sections, it shows that cities have been growing demographically and spatially and will continue to do so.

At the same time, the data paint a picture of overall growth: the number of cities globally doubled between 1975 and 2020 to 14,000. However, the data also show that the growth in the number of cities will slow down—with only another 3,000 new cities appearing over the next 50 years. As the following subsections will illustrate, this global slowdown in the growth of the number of cities hides a lot of variation,

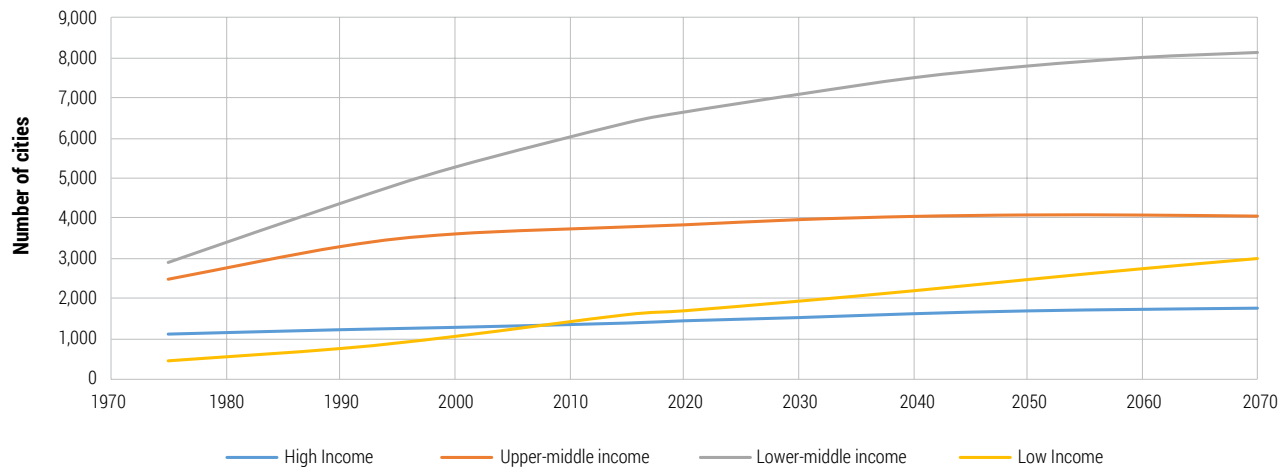
some based on size of cities (Box 2.5), income grouping and geographic region. Some will even experience population loss and shrinkage in the future.

Box 2.5: City size classification

Cities as defined by the Degree of Urbanization are divided into four size classes:

1. Small cities have a population between 50,000 and 250,000 inhabitants.
2. Medium-sized cities have a population between 250,000 and 1 million inhabitants.
3. Large cities have a population between 1 and 5 million inhabitants.
4. Very large cities have a population of a least 5 million inhabitants.

Figure 2.12: Growth in the number of cities 1975–2070 by income group



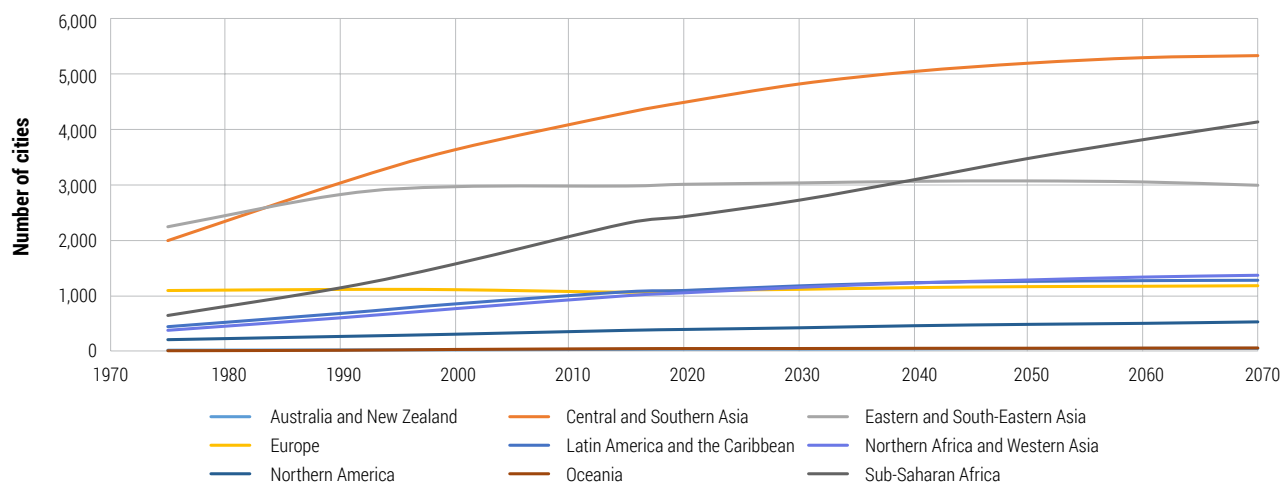
2.4.1. Cities in low-income countries continue to grow in numbers

Low-income countries experienced the largest increases in the number of cities between 1975 and 2020 (+270 per cent), while high-income countries experienced the smallest increase (+30 per cent). Increases in middle-income countries were between these two extremes (+55 per cent and +130 per cent) (Figure 2.12). Projections indicate that, between 2020 and 2070, the number of cities in low-income countries will grow far more than in the rest of the world. An increase of 76 per cent, compared to 6 per cent in upper-middle-income countries. The number of cities in high-income and lower-middle-income countries will both increase by about 20 per cent.

From a geographical perspective, the two regions with the biggest absolute increase in the number of cities between 1975 and 2020 are Central and Southern Asia (+2,500) and Sub-Saharan Africa (+1,800) (Figure 2.13). According to the projections, they will also experience the biggest increases between 2020 and 2070 (+850 and +1,700, respectively).

The two regions with the lowest relative increase in the number of cities between 1975 and 2020 are Europe, where they remained constant, and Eastern and South-Eastern Asia, where they increased by 35 per cent. The projections also suggest that the growth in cities will remain low in these two regions. In Europe, the number of cities is projected

Figure 2.13 Growth in the number of cities 1975–2070 by region of the world



to increase by only 9 per cent between 2020 and 2070 while the number of cities is projected to remain constant in Eastern and South-Eastern Asia.

The biggest increase in cities with 1 or 5 million inhabitants between 2020 and 2070 is projected to happen in Sub-Saharan Africa and Central and Southern Asia. In Sub-Saharan Africa, the number of cities with at least 1 million inhabitants will increase from 60 to 134 over the next 50 years and those with at least 5 million will increase from six to 28. For Central and Southern Asia, the respective increases are from 117 to 183 and from 16 to 31. In all other regions, the increase is much lower. Notably, Eastern and South-Eastern Asia is projected to see a small reduction of cities with at least 5 million, from 29 to 27.

2.4.2. In more developed countries, the largest city tends to be more important

Urbanization and the concentration of population in cities is seen by standard economic geography as a finite and beneficial process, part of the transformation from agrarian to industrialized societies. Higher concentration has been historically associated with economic development, improvements in living standards, better education, lower fertility, technological development and increased productivity. However, these outcomes are not guaranteed,

especially in poorer countries, and urbanization by itself is not a sufficient condition for economic development.³¹

The new harmonized definition and data set allow us to capture primacy, or the relative importance of the biggest city, in two ways: (a) by calculating the population in the largest city relative to total city population in a country and (b) via the Hirschman-Herfindahl Index (HHI), a common measure of concentration.³² Noteworthy, because, for most countries, it was not possible to obtain data for each city, most studies relied on a less suitable indicator: the population of the largest city as a share of the national population.

Overall, primacy tends to be higher in smaller countries as well as in more developed countries (Table 2.1). A small country may only have a single city, leading to high primacy. For example, Bahrain, Lesotho, Mauritius, Timor-Leste and Singapore only have one city. In a large country, a single city cannot capture a large share of the country's city population. For example, in India the biggest city only accounts for 4 per cent of the country's city population. The city population share in the largest city decreases from 69 per cent in small countries (1 to 5 million total population) to 21 per cent on average in very large countries (i.e., with more than 100 million inhabitants); HHI decreases from 56 per cent on average in small countries to 8 per cent on average in very large countries.

Figure 2.14: Number of cities with at least 1 or 5 million inhabitants per region, 2020–2070

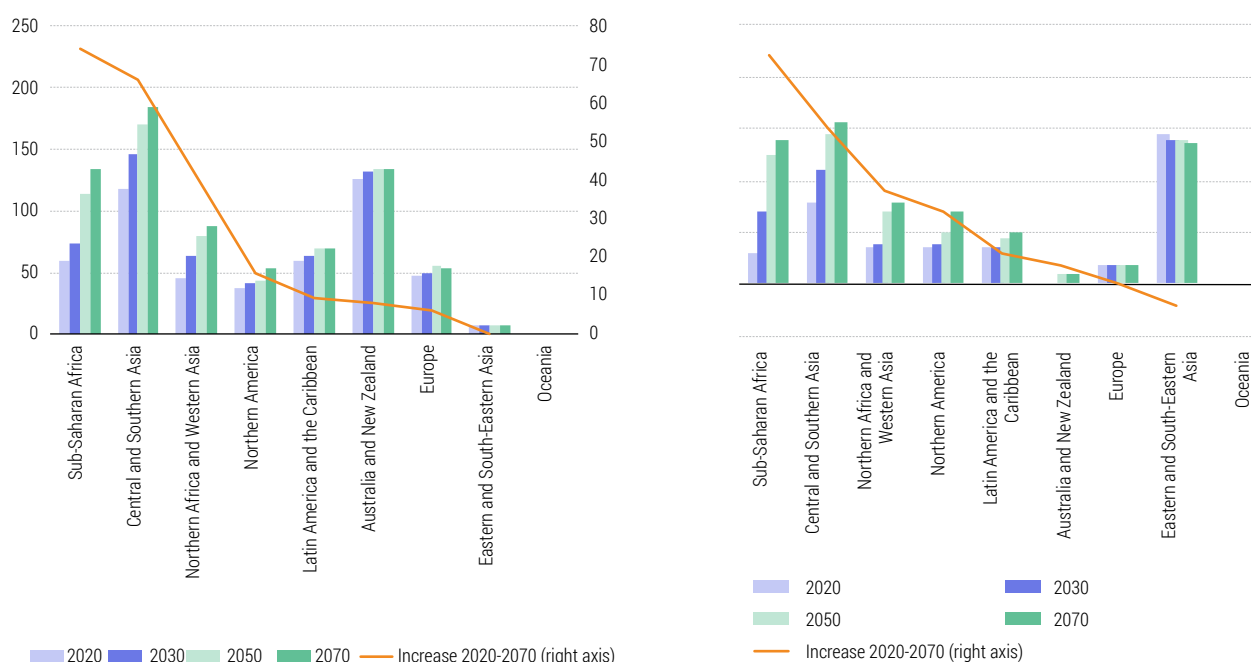


Table 2.1: Urban primacy by country size and income group or SDG region, 2020

Country population size group	1-5 million	5-10 million	10-25 million	25-50 million	50-100 million	> 100 million	Total
Population in largest city as share of population in all cities							
Low Income	62%	63%	37%	37%	29%	6%	41%
Lower-middle income	77%	46%	47%	28%	32%	24%	44%
Upper-middle income	62%	55%	40%	34%	35%	18%	45%
High Income	74%	62%	47%	25%	31%	25%	53%
Oceania		8%					8%
Northern America				30%		10%	20%
Central and Southern Asia		50%	43%	35%	26%	15%	34%
Australia and New Zealand	61%			28%			45%
Sub-Saharan Africa	65%	60%	35%	39%	31%	9%	45%
Europe	62%	54%	43%	18%	24%	22%	47%
Latin America and the Caribbean	71%	57%	44%	39%	27%	22%	49%
Northern Africa and Western Asia	82%	53%	50%	23%	30%	32%	50%
Eastern and South-Eastern Asia	96%	84%	56%	31%	45%	31%	54%
All	69%	56%	42%	31%	32%	21%	46%
Herfindahl- Hirschman Index							
Low Income	45%	43%	19%	17%	12%	1%	24%
Lower-middle income	67%	29%	28%	12%	13%	9%	28%
Upper-middle income	47%	38%	21%	16%	17%	5%	29%
High Income	61%	46%	28%	12%	15%	11%	38%
Oceania		3%					3%
Northern America				13%		3%	8%
Central and Southern Asia		29%	25%	14%	8%	5%	17%
Australia and New Zealand	40%			17%			29%
Sub-Saharan Africa	54%	40%	18%	20%	13%	1%	29%
Europe	45%	37%	25%	7%	9%	6%	30%
Latin America and the Caribbean	54%	39%	25%	20%	10%	7%	31%
Northern Africa and Western Asia	72%	35%	31%	7%	11%	12%	35%
Eastern and South-Eastern Asia	93%	74%	35%	13%	25%	14%	39%
All	56%	39%	23%	14%	15%	8%	30%

Note: SDG regions ranked from low to high primacy. Countries with less than 1 million inhabitants are not included.

Primacy also tends to be higher in high-income countries than in lower-income countries, but the relationship is complex. Econometric analyses show that the relationship between the concentration of population in the biggest city, or primacy, and economic growth is not linear. Given the population size and the level of development of a country, there is an optimal range of primacy where it contributes to economic growth, beyond which it acts as a brake on development.³³

As population continues to grow in most countries, primacy is also projected to drop. On average, city primacy in 2020 was 46 per cent, which is slightly lower than in 1975 (49 per cent). Projections indicate that it will continue to drop, reaching 45 per cent in 2070. The HHI shows the same pattern: decreasing from 36 per cent in 1975 to 30 per cent in 2020 and projected to reach 29 per cent in 2070.

The two regions with the highest average primacy are Eastern and South-Eastern Asia and Northern Africa and Western Asia. In both, primacy tends to be significantly higher in the various country population size groups, which may indicate that excessive primacy could limit economic growth. Faster population growth of the smaller cities in these countries would reduce their primacy and may help to reduce pressure on the largest city.

2.4.3. More and more people are living in large cities

City population growth varies by income group and city population size (Figure 2.15). In low-income countries, city population increases from below 100 million people in 1975 to more than 700 million people in 2070. Most significant change takes place in the cities with more than 5 million inhabitants. Low-income countries did not have a single city of this size in 1975. By 2020 there were three cities with more than 5 million inhabitants, which hosted about 18 million people: Dar es Salaam, Tanzania; Kabul, Afghanistan; and Kinshasa, Democratic Republic of the Congo. By 2070, low-income countries are projected to have 15 cities in this class with a cumulative population exceeding 150 million people. The total population in cities of between 1 and 5 million inhabitants was only 18 million in 1975. That figure

tripled to 70 million in 2020 and is projected to double by 2070 to reach almost 140 million.

Population in cities in lower-middle-income countries is projected to increase from half a billion to 2.5 billion people between 1975 and 2070. Population increases were the biggest for cities with at least 5 million inhabitants, increasing from 60 to about 360 million between 1975 and 2020 (+500 per cent). The projections indicate that this population will further increase to 830 million by 2070.

City population in upper-middle-income countries increased from 540 million people in 1975 to 1.2 billion people in 2020, but projections show that the population size will level off over the coming decades, stagnating at around 1.35 billion between 2050 and 2070. The largest increments in city population in these countries have taken place prior to 2020. Noteworthy, the growth in city population is concentrated in cities with at least 5 million inhabitants, which increased from 65 million in 1975 to 310 million in 2020 (+400 per cent). It is projected to still increase, but at a much slower rate, to 370 million by 2070 (+20 per cent). Population in smaller cities grows more slowly in upper-middle-income countries.

City population in high-income countries grew from about 350 million people in 1975 to about 615 million people in 2020, and is projected to pass 800 million people in 2070. Notably, cities with at least 5 million inhabitants are exhibiting an almost similar trend. These cities had a population of only 80 million in 1975, which increased two and a half times to reach 200 million in 2020 and is projected to reach over 300 million in 2070. On the other hand, the slow growth recorded in smaller cities is projected to continue into the future. However, as noted in Chapter 1, the COVID-19 pandemic has resulted in a net population decline of some large cities of countries like the US as people migrate to smaller cities and towns, a shift speculated to be temporary.

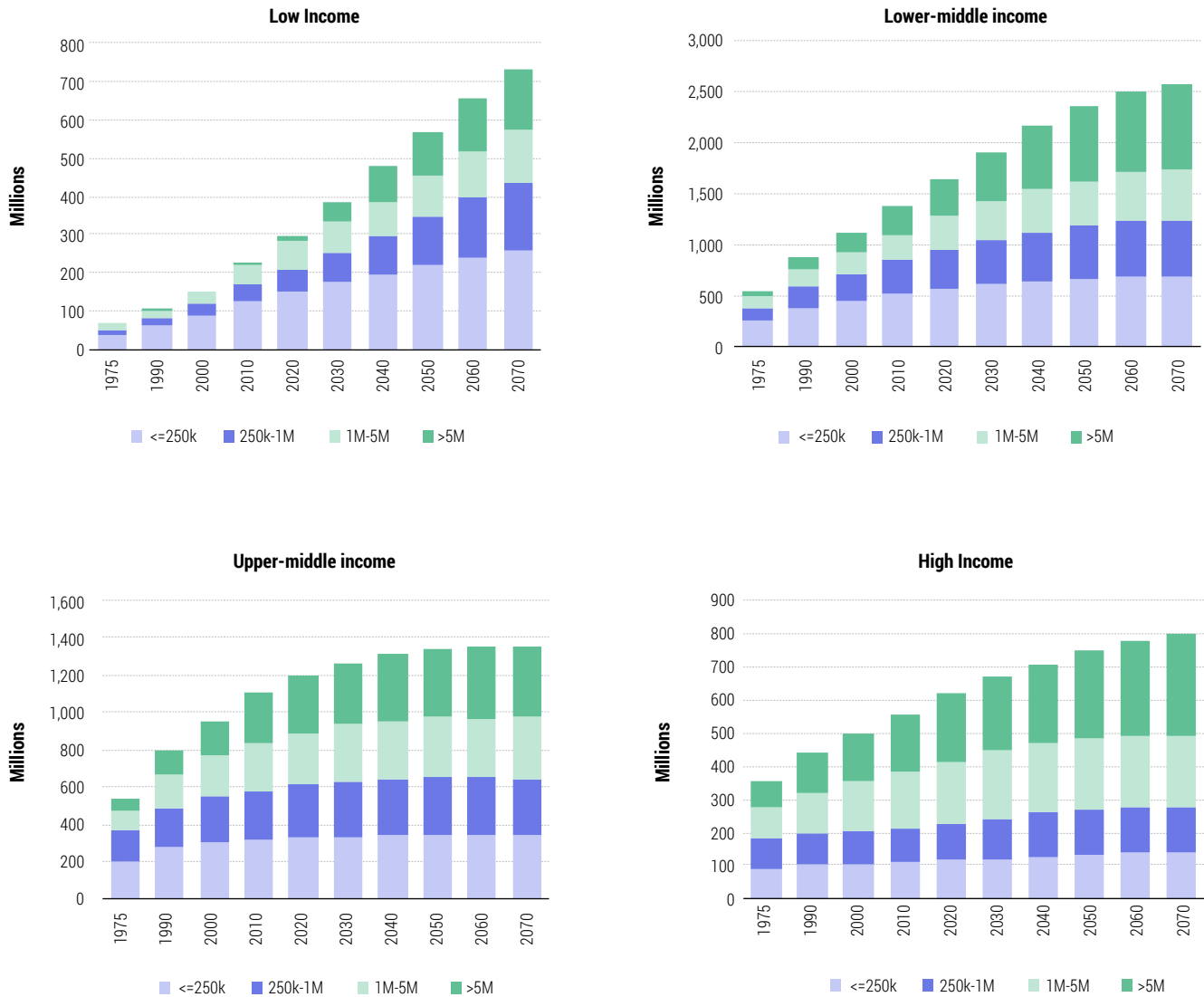
There are significant differences between income classes when it comes to the change of city numbers over time. Overall, there is an accentuated growth of cities in lower-income countries. This trend is particularly clear from Figure 2.16 in the low-income subplot (top-left quadrant), where there is a linear growth of cities in all city size classes, except from the largest size class (with more than 5 million inhabitants). The growth of the number of cities with at least 5 million inhabitants in low-income countries is high and increases over time.



The total population in cities of between 1 and 5 million inhabitants was only 18 million in 1975. That figure tripled to 70 million in 2020 and is projected to double by 2070 to reach almost 140 million



Figure 2.15: City population by city size and income group, 1975–2070

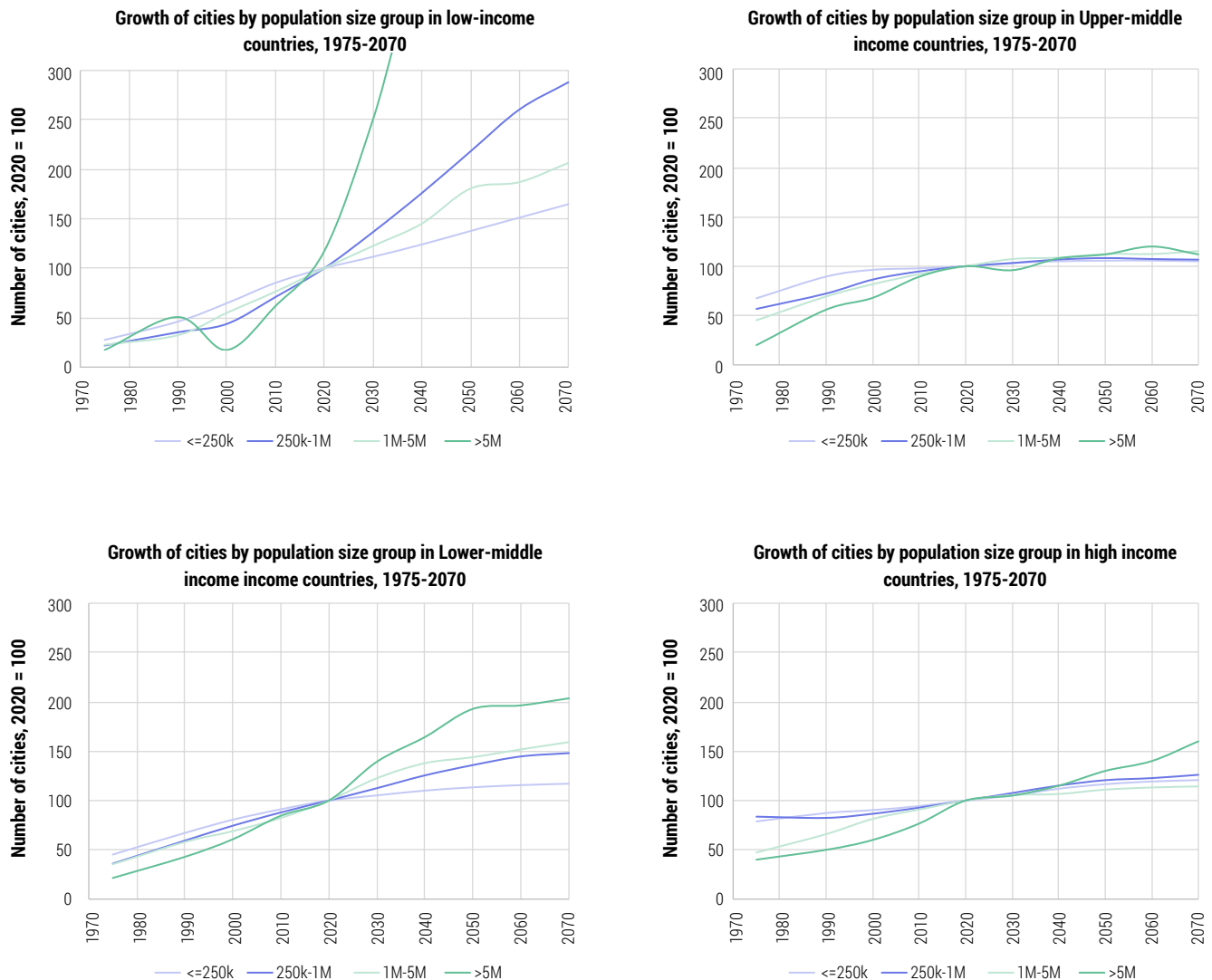


In the lower-middle-income countries (top-right quadrant), the number of large cities grew slightly faster between 1975 and 2020. Projections indicate that this process will continue with higher growth in the number of cities with at least 5 million inhabitants while the growth in the smaller cities slows down.

In upper-middle-income countries (bottom-left quadrant), the number of cities stabilizes after 2020 for all city classes. In high-income countries, the number of cities with at 5 five million inhabitants continues to grow also beyond 2020, while the number of smaller cities only increases slightly.

2.4.4. Most growth in city land will occur in low-income countries

As the world continues to urbanize, sustainable urban futures depend increasingly on the successful management of this urban growth. This expansion should be anticipated with sound planning policies and related actions that guard against dysfunctional and exploitative development practices such as land speculation and unserviceable sprawl, which cause inefficiencies and distortions that undermine the urban economy.³⁴

Figure 2.16: Growth of the number of cities by population size and income group, 1975-2070

The successful management of this urban growth—especially in low-income and lower-middle-income countries, where the pace of urbanization is projected to be the fastest—is key for sustainable development.³⁵ The new data from the Degree of Urbanization approach show that changes—in terms of growth of city land area from 2020 levels—will mostly take place in low-income countries (+141 per cent), lower-middle-income (+44 per cent) and high-income countries (+34 per cent) (Figure 2.17). Changes in upper-middle-income countries are projected to be relatively small (+13 per cent). Growth of physical extent of city land is projected to be highest in Oceania (+109 per cent) and Sub-Saharan Africa, where it is projected to almost double.

The rapid spatial expansion of the physical extent of cities in Sub-Saharan Africa, for instance, is to a large extent attributed to peri-urbanization. The region is experiencing continual engulfment of un-serviced land in a mostly informal process largely driven by low-income households attempting to secure land that is affordable and in reasonable locations.³⁶ Recent studies have also confirmed that this rapid spatial expansion is taking place at a higher pace in small and secondary cities than it is in large cities.³⁷

Often, government structures, institutional capacities, regulatory frameworks and land tenure systems in most countries in Sub-Saharan Africa are not able to respond

effectively to the emergence of these new settlements. As such, expansion areas are not well-planned and, as well, lack public goods and social amenities—thus charting an inefficient and unsustainable spatial development path with significant negative implications e.g. for rural livelihoods, agriculture and food security.³⁸

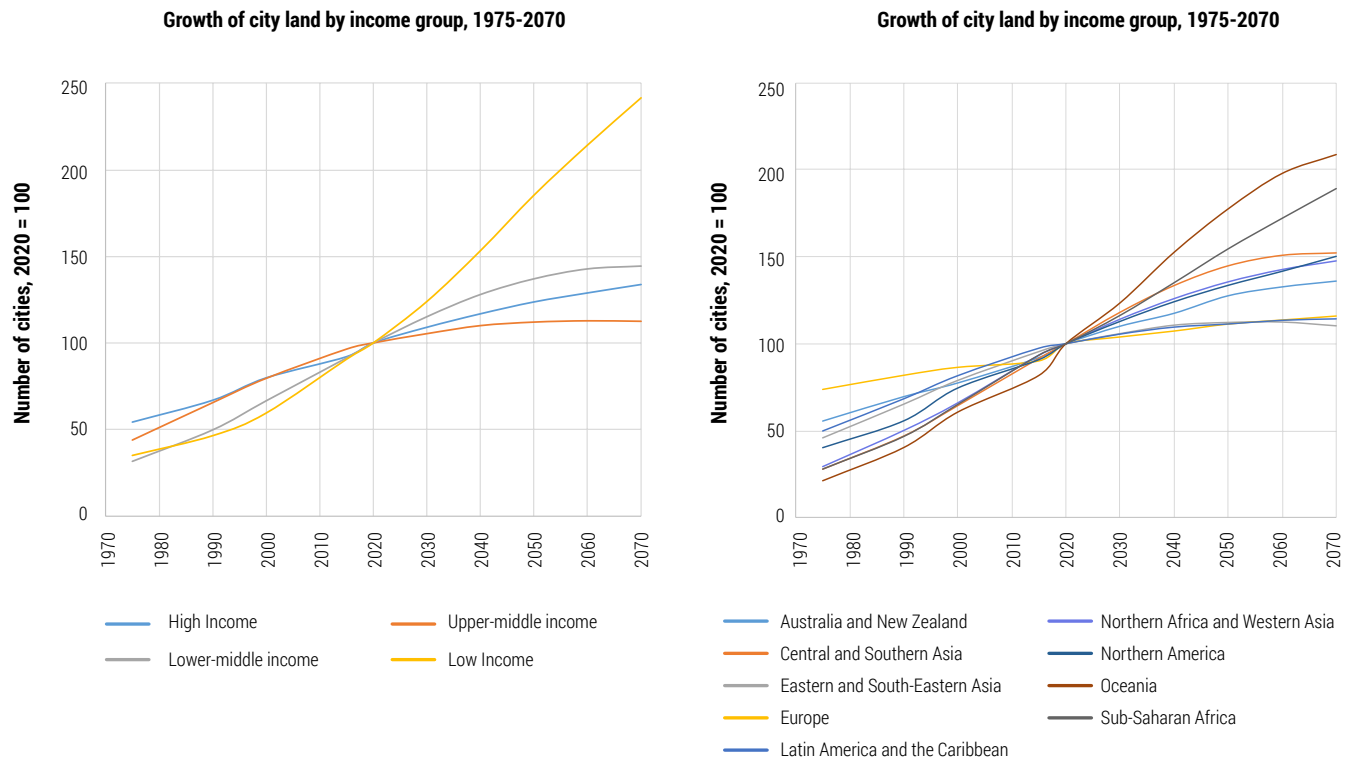
On the other hand, the projections show that lowest growth in city land will be in Eastern and South-Eastern Asia (+10 per cent), Latin America and the Caribbean (+14 per cent) and Europe (+16 per cent). These regions are relatively highly urbanized and will be experiencing some of the smallest increase in city population share (Figure 2.4). Notably, a number of cities in these regions are projected to experience some level of shrinkage (Map 2.1).

Shrinkage is not a new phenomenon. Past UN-Habitat flagship reports have recorded this phenomenon in both developing and developed countries, triggered by various reasons.³⁹ Shrinking cities are often characterized by deteriorating living conditions, environmental degradation, urban decay

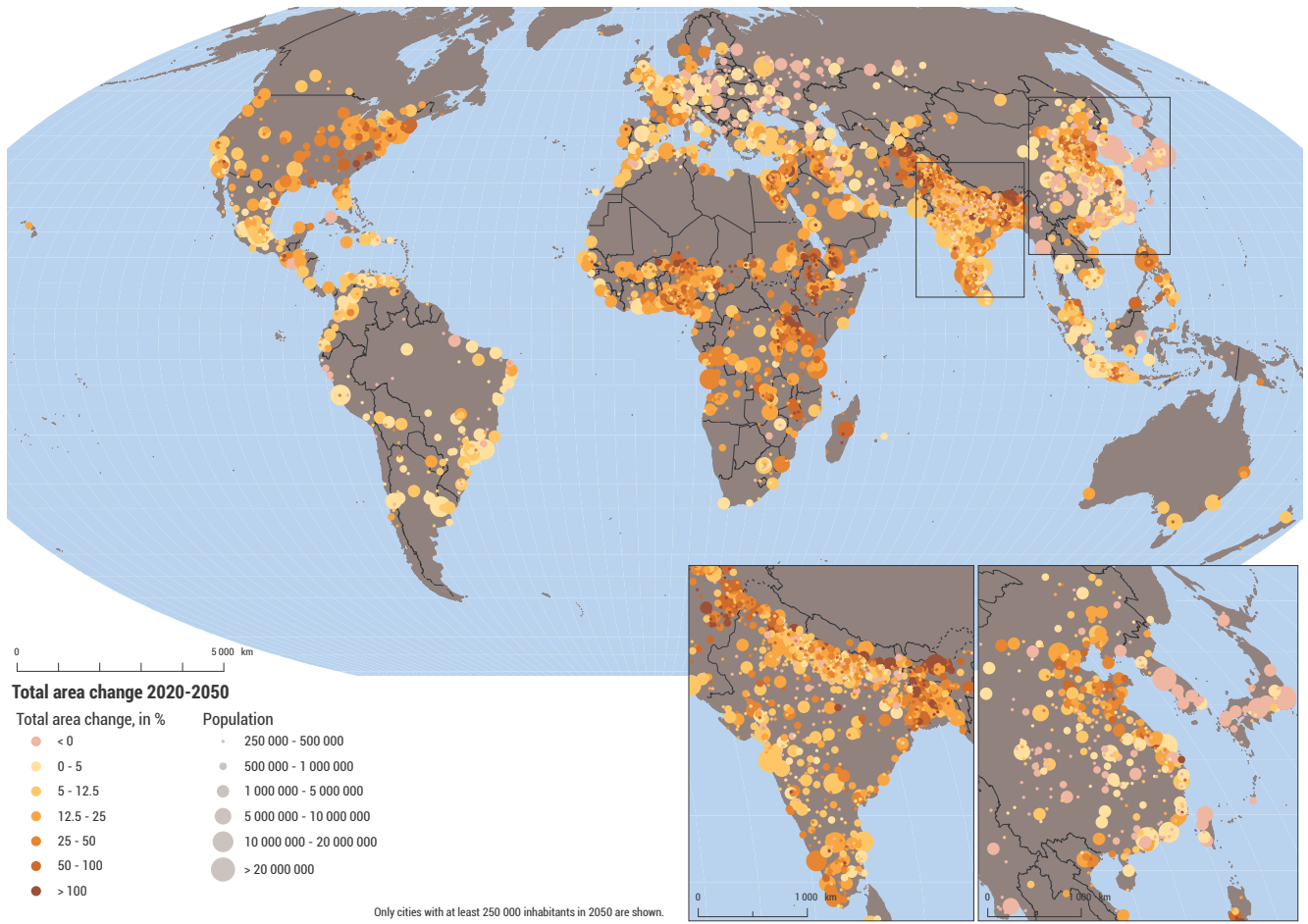
such as property abandonment and a rise in inequality. These worsening conditions force residents to seek opportunities in other cities that offer higher quality of life, further spiralling shrinking cities into long-term population loss if necessary measures and strategies are not implemented to tackle the decline.⁴⁰

While most of the cities projected to shrink by 2050 are small (in Armenia, Barbados, Belarus, China, Cuba, El Salvador, Georgia, Germany, Japan, Moldova, Republic of Korea, Russia and Ukraine), there are notable large cities whose land area is projected to shrink by more than one-tenth by 2050. These include Daegu, Republic of Korea (-14 per cent); Kitakyushu, Japan (-15 per cent); and Saint Petersburg, Russia (-20 per cent). The management of shrinking cities requires innovative measures and strategies by policymakers (Box 2.6). For example, Kitakyushu City—once renown as a major iron and steel centre during the rapid industrialization years of Japan and now home to the fastest-growing ageing population—has adopted green growth strategies to address population decline and ensure regional revitalization.⁴¹

Figure 2.17: Growth of city land by income group and region, 1975–2070



Map 2.1: City land area change, 2020–2050



Ouagadougou (Burkina Faso) is an example of a rapidly growing capital in Africa © Felix Vollmann/UN-Habitat

Box 2.6: Shrinking cities: Planning for future growth while anticipating decline

Management of shrinking cities requires innovative skills and strategies to contain population flight and attract new residents. Policymakers should consider the following:

- Continuous monitoring is indispensable to understand population and spatial changes for evidence-based policy formulation and future planning. This is useful in assessing the persistent presence of urban growth or shrinkage. In most places, poor data and information (often lacking geographical detail) creates challenges for evidence-based policy formulation.
- Regional integration, connectivity and networking schemes aid cooperative public policy in changing urban areas. Improved connectivity, for instance, is critical to maximizing the potential economic benefits of agglomeration or helping to offset the loss of it. Moreover, enhanced networking of people and firms fosters innovation as well as the exchange of ideas, goods and services.
- Public-private partnerships allow for innovation, renewal and adaptation of the fiscal bases of cities. The focus of the revitalization efforts in these cities should be on the needs of the disadvantaged segment of the population. Importantly, ensuring voices from such groups are heard and they benefit from the growth and establishment of local anchor institutions rather than be pushed out by the changing conditions (e.g. through gentrification). It is imperative to enhance public participation policies that encourage more engagement from various actors in the planning process.
- Investments in public education and workforce development as well as knowledge transfer and economic diversification can assist regions in moving from outdated economic activities to new businesses and sources of revenue.
- Increasing openness towards external migrants and integrating them into cities as part of a revitalization strategy to counteract for depopulation from outmigration.
- Urban policies should facilitate planning for industrial environmental impacts in the declining phases of cities, and for management of the environmental legacy of industrial activities.
- Flexible design and placement of assets (such as industrial infrastructure, commercial buildings, and infrastructure for water, sewage, electricity and industrial land) facilitate transformation into new uses when necessary. For example, launch a green transformation of abandoned industrial districts into ecological open space or revitalized public space, like a creatively-designed industrial park.
- Issues surrounding the environmental legacy of shrinking cities are a global phenomenon: planners and policymakers need to be aware of the environmental changes that lead to shrinkage as well as the ways in which shrinkage leads to environmental changes. Moreover, pursuing environmental justice presents an opportunity for addressing the decline (i.e., it can form a basis for revitalization).

Source: Chen et al, 2021; Ortiz-Moya, 2020; Silverman, 2018; OECD, 2016; UN-Habitat, 2008; Martinez-Fernandez and Wu, 2007.

When these changes in city land are observed from the lens of city size and income groups, results show that the lower the income of a country, the higher the share of city land covered by small cities (less than 250,000 inhabitants) (Figure 2.18). In 2020, for instance, almost half of all city land in low-income countries was covered by small cities, compared to around one-third in middle-income countries and one-quarter in high-income countries. By 2070, the share of land in small cities is projected to drop slightly as

the land covered by larger cities grows faster. Nevertheless, the big difference between income groups will remain with a far higher share of land covered by small cities in low-income countries (45 per cent) as compared to high-income countries (23 per cent).

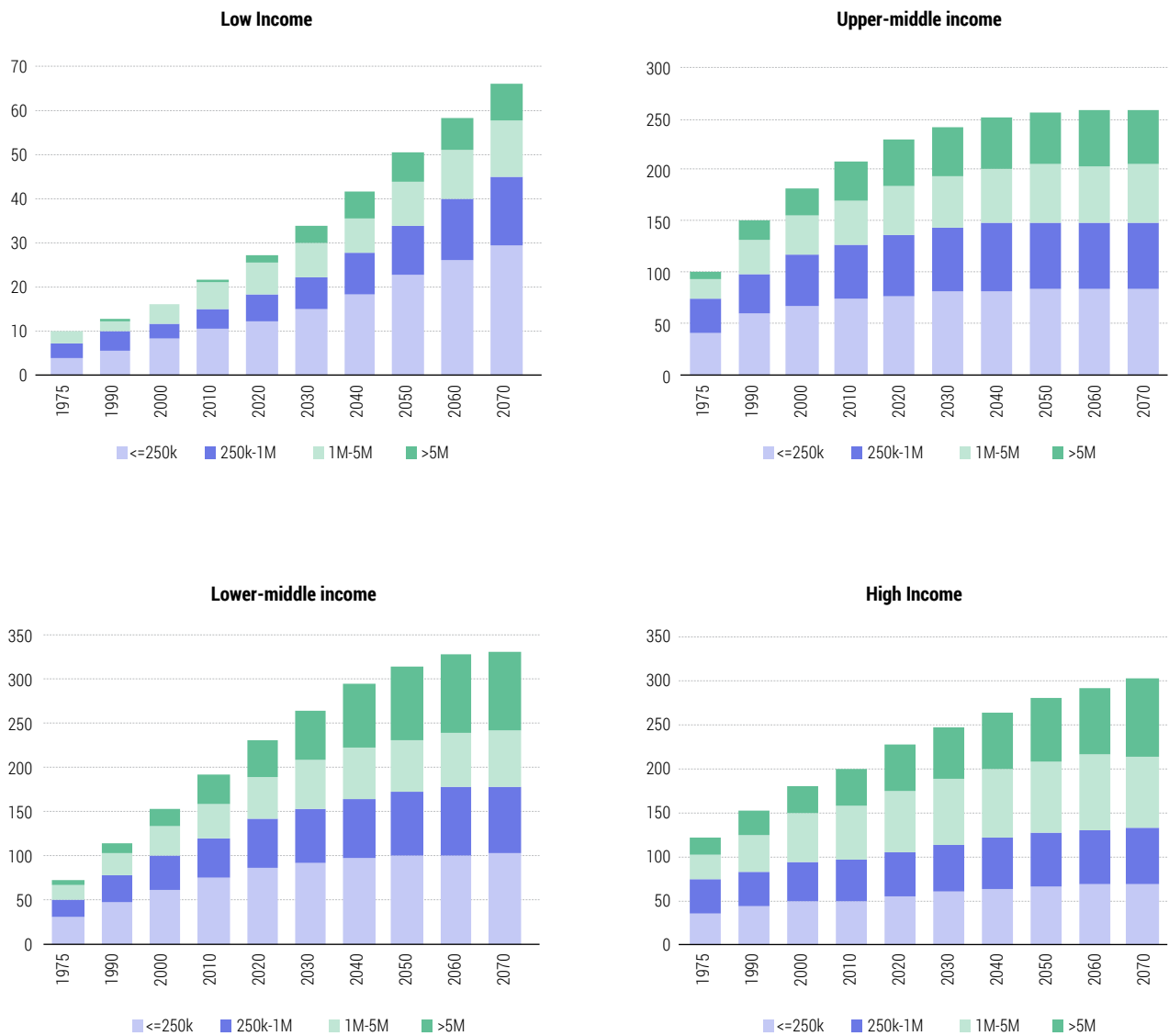
This trend essentially implies that small cities— as well as towns and semi-dense areas (as illustrated in Figure 2.6 and Figure 2.7)—remain critical to achieving sustainable

development, especially in low-income countries. It is in these settlements that a variety of urban-rural linkages in production, consumption and financial relationships, have profound impact across the urban-rural continuum are fostered;⁴² small cities (and towns and semi-dense areas) essentially enhance synergy within the continuum of human settlements. Therefore, given share of city land covered by these settlements, adequate territorial planning and enhanced capacities in these settlements can strengthen

the pivotal role they play as well to help reduce pressure on primary cities in developing regions.

Small cities— as well as towns and semi-dense areas remain critical to achieving sustainable development, especially in low-income countries

Figure 2.18: City land by city size and income group, 1975–2070 (thousand square kilometres)



2.5. Sustainable Futures: How Dense Should Our Cities Be?

The growth of cities both demographically and spatially over the past several decades has highlighted the challenges of managing city growth. UN-Habitat promotes well-planned and designed cities with adequate densities and recommends increasing densities where necessary. The various classes of urban settlements discussed in this chapter can accommodate growth through a mix of strategies, such as densification, mixed-use development, affordable housing, improved connectivity, increased access to public space and a diversity of employment opportunities. These strategies should be underscored by inclusive governance arrangements that promote socially cohesive urban communities.⁴³

This section explores and shows the impact of three different city development scenarios on the demand for city land and city population densities in 2050. Density, increasingly seen as a critical sustainability metric, is employed in these scenarios because it is “the intervening measure that translates population into land consumption.”⁴⁴ The three scenarios are based on the density of cities, towns and semi-dense areas for three different parts of the world (Table 2.2). The biggest differences in density are for cities, a nine-fold increase from the low- to the high-density scenario, followed by towns with a six-fold increase, while semi-dense areas remain very similar across the three scenarios. The population density of a city is critical as it determines how much land is needed to accommodate a given population. In this section, cities with a density below 3,000 inhabitants per sq. km are considered “low density,” between 3,000 and 6,000 is considered “medium density,” above 6,000 is considered “high density.”

In the low-density scenario, a city will tend to grow more horizontally and less vertically. For example, population density would not increase much in the centre of the city and most growth would occur at the edges of the city and at lower densities as illustrated by the case of Maputo,

Mozambique, in Figure 2.19. The land covered by the city of Maputo would more than double under all three scenarios. In the low-density scenario, for instance, the land occupied by the city of Maputo would increase by almost 160 per cent, while its population density drops from 6,000 to 5,000 inhabitants per sq. km (see Figure 2.19, top right). Under the high-density scenario, more growth will occur within the initial boundaries of the city, thus increasing density levels, and additional city land will also be relatively high density. Under this scenario, Maputo’s land would only grow by 35 per cent, but its population density would double to 13,000 inhabitants per sq. km (see Figure 2.19, bottom right). The medium density scenario leads to a moderate increase in population density and more limited spatial expansion (see Figure 2.19, bottom left).

It worth noting that population growth within the initial boundaries of a city or a town can be accommodated through planned infills or densification by building on vacant land within the town or city, replacing low-rise buildings with medium- or high-rise buildings. Planned city infills can respond to future urban growth in an orderly manner, minimizing expansion through inefficient land-use patterns and leapfrogging that generates wasteful areas as well as avenues for speculation. Infills can also remedy fragmented urban spaces.

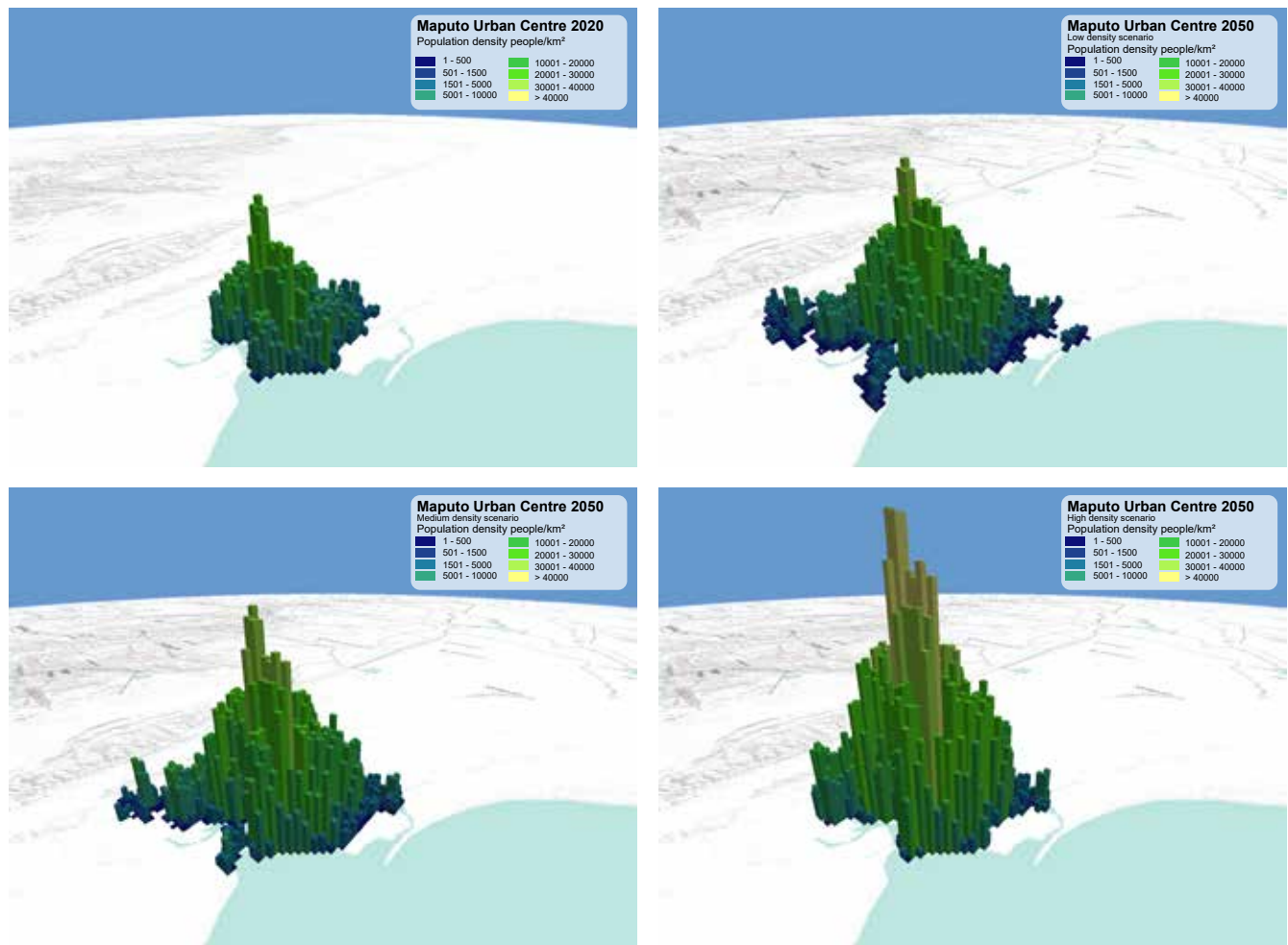
Planned city infills can respond to future urban growth in an orderly manner, minimizing expansion through inefficient land-use patterns and leapfrogging that generates wasteful areas as well as avenues for speculation

These density scenarios play out differently for cities in various regions of the world. Medellín, Colombia—with a very high population density at 16,000 inhabitants per sq. km in 2020—is projected to grow its city’s area in the range of 17 per cent and 100 per cent between 2020 and 2050 depending on the scenario. In the low-density scenario,

Table 2.2: Population density in three development scenarios

Scenario	Based on	Population density in 2015, inhabitants per sq. km		
		Cities	Towns	Semi-dense areas
Low density	Northern America	1,700	900	750
Medium density	Northern and Western Europe	3,800	1,300	770
High density	Eastern Asia	15,000	5,300	900

Figure 2.19: Maputo in 2020 and in 2050 under three different scenarios



its area would double and its density would drop to 9,500 inhabitants per sq. km, which is still high. The high-density scenario (Figure 2.20) would mean no expansion of city land, but density would further increase to 21,000 inhabitants per sq. km. The medium-density scenario strikes a balance between the demand for land and density with a spatial expansion of only 33 per cent and a small reduction in population density to 14,000 inhabitants per sq. km.

The population of Lusaka, Zambia, is projected to at least double between 2020 and 2050. In the high-density scenario, city land would only increase by 16 per cent, but this scenario doubles its density to 17,600 inhabitants per sq. km. In the moderate density scenario, city land doubles,

which keeps population density around 8,700 inhabitants per sq. km. In the low-density scenario, population density drops to 6,300 inhabitants per sq. km, and its area increases by 150 per cent.

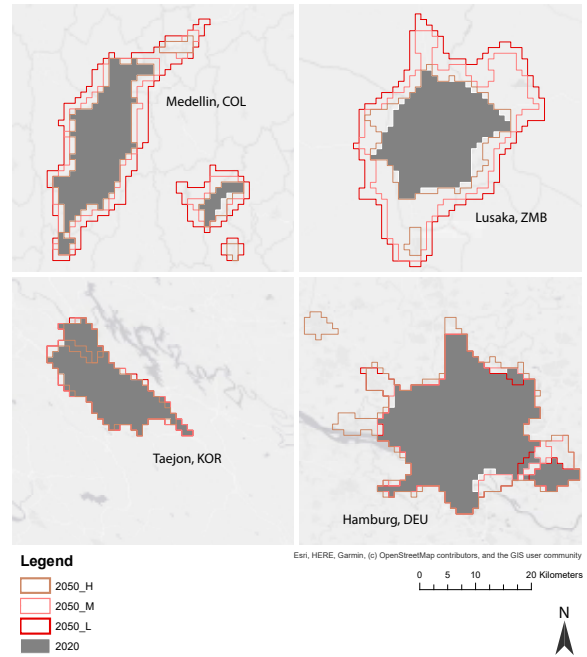
Taejon, Republic of Korea, and Hamburg, Germany, are cities where the impact of the scenarios is far smaller because their populations are not really projected to grow. For Taejon, city land barely increases in the moderate- and low-density scenario, while in the high-density scenario city land shrinks (-23 per cent). In Hamburg, also virtually nothing changes in the moderate- and low-density scenario, but in the high-density scenario Hamburg attracts more residents leading to a growth in population (71 per cent) and in area (31 per cent).

2.5.1. City densities are high and growing in low-income countries

A review of past trends using the harmonized data from the Degree of Urbanization approach shows that cities in low-income countries are among the densest in the world. On average, their density has increased over time from 7,000 to 11,000 inhabitants per sq. km between 1975 and 2015 (Figure 2.21). Cities in lower-middle-income countries had a similar density to that of cities in low-income countries in 1975, but their densities dropped a bit as their cities expanded slightly faster than their populations grew. In 2015, their cities had an average density of about 7,000 inhabitants per sq. km. In upper-middle-income countries and high-income countries, city densities were lower (5,000 and 3,000 respectively) and barely changed over time. These countries experienced slower population growth, which reduced the challenge of providing enough housing and infrastructure.

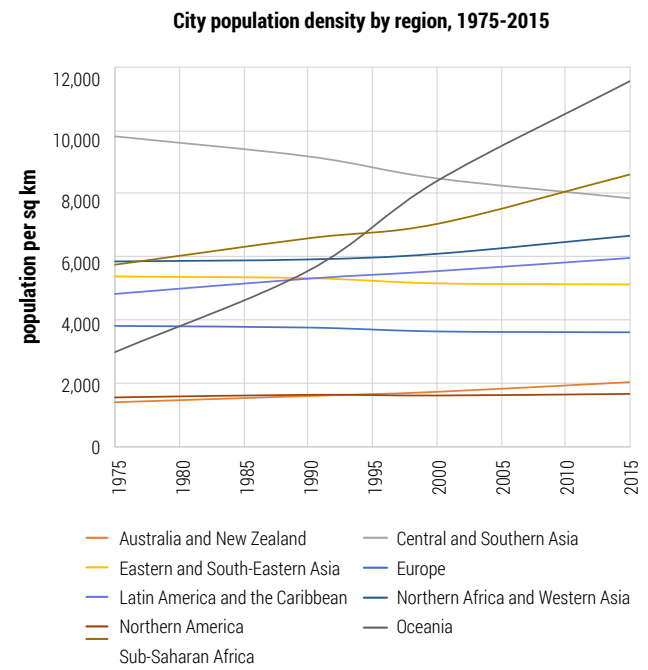
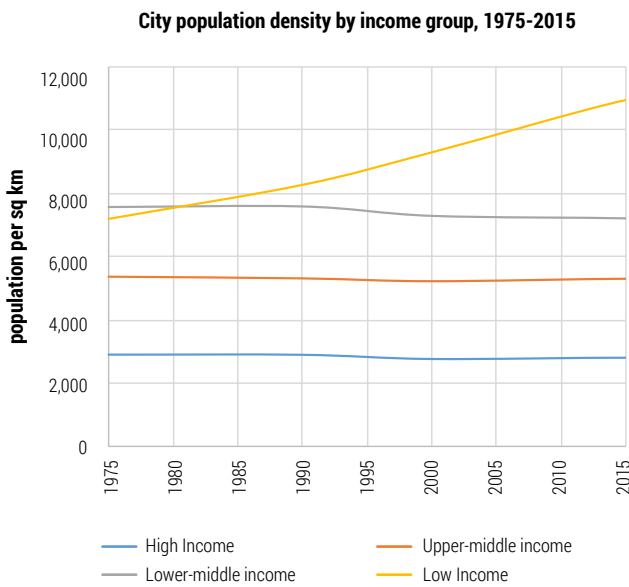
City population density by region shows more variation with the highest densities in Central and Southern Asia, Oceania and Sub-Saharan Africa and the lowest densities in Australia, New Zealand and Northern America (Figure 2.21 and Map 2.2). In most countries, the density increases with the population size of the city, except in low-income countries where on average density does not necessarily increase with population size as smaller cities also tend to be dense.

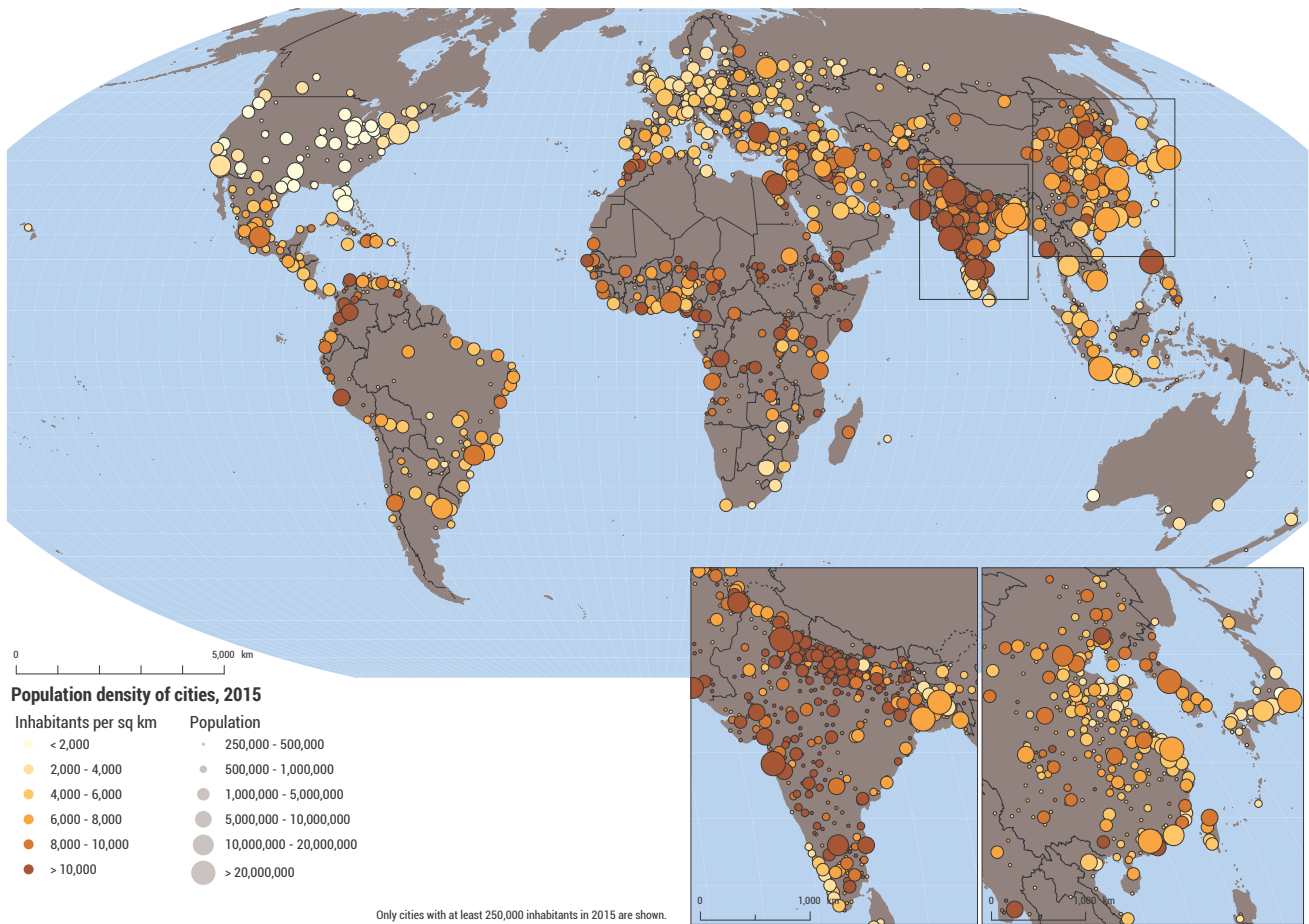
Figure 2.20: City expansion under three development scenarios in Medellin, Lusaka, Taejon and Hamburg



cities in low-income countries are among the densest in the world. On average, their density has increased over time from 7,000 to 11,000 inhabitants per sq. km between 1975 and 2015

Figure 2.21: City population density by income group and region, 1975–2015



Map 2.2: Population density in cities, 2015

The impact of the three scenarios depends on rate of population growth. The scenarios take into account that it is easier to change the density of new developments than of existing ones. As a result, the biggest impact is on the low-income countries as their population is projected to increase the most (64 per cent between 2020 and 2050), while the population increase in the other income groups is much smaller (ranging from 2 to 29 per cent). For example, city densities would not change dramatically in Northern America, Australia, New Zealand and Europe because their population growth is relatively low (Figure 2.22). By contrast, densities would continue to increase rapidly in Sub-Saharan Africa in the high-density scenario and drop substantially in the low-density scenario.

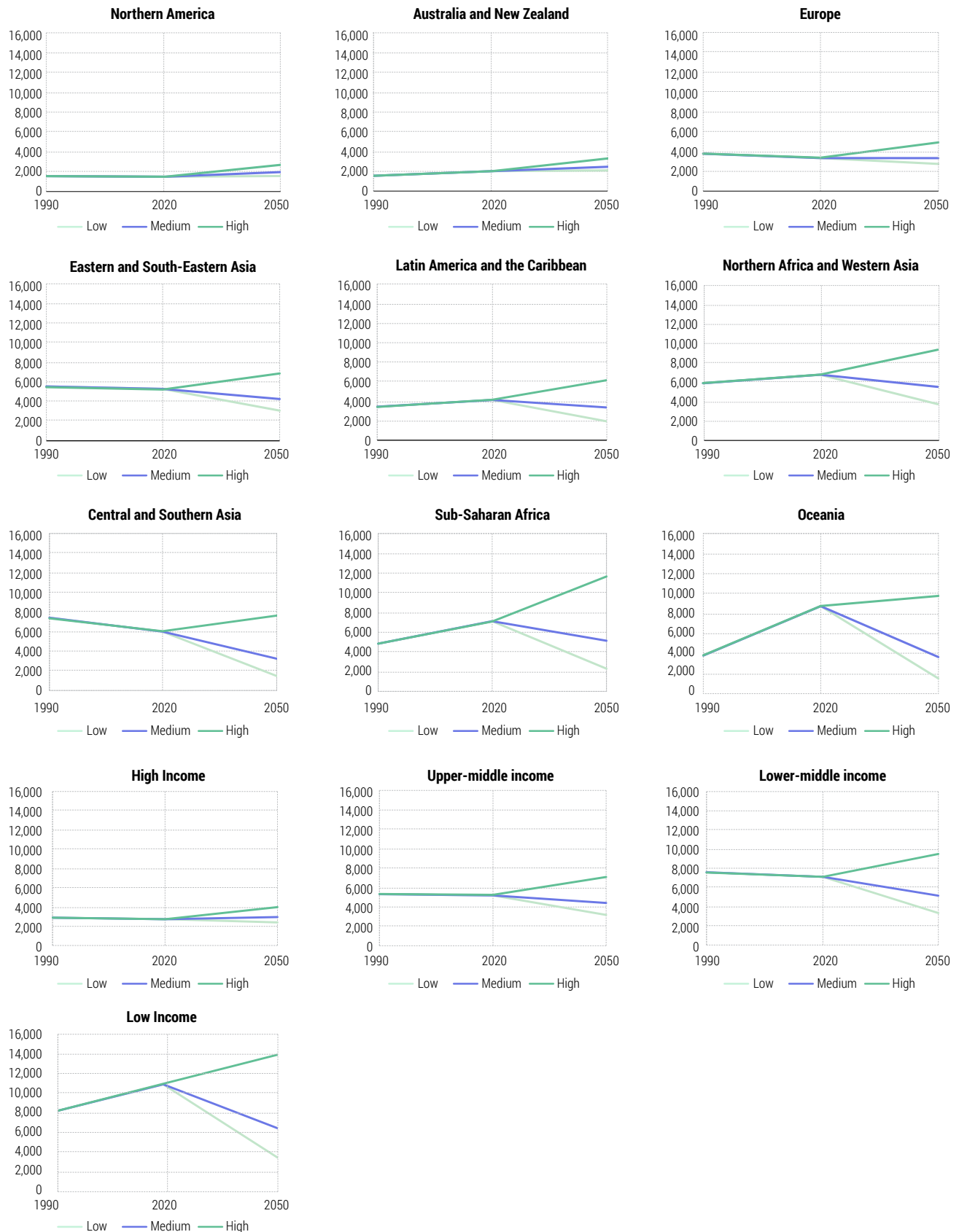
Under the high-density scenario, population density in cities in low-income countries would continue to increase and reach 14,000 by 2050, while densities in high-income countries would increase the least reaching just

4,000 by 2050. The two middle-income groups would both experience a moderate increase reaching 9,000 in lower-middle-income and 7,000 in upper-middle-income countries (Figure 2.22).

2.5.2. Aiming for adequate densities and managing city expansions

Compact, socially inclusive, better integrated and connected cities are an imperative for sustainable urban futures. As highlighted in previous sections of this chapter and in Chapter 6, the negative social, economic and environmental impacts of dispersed urban growth are significant. On the other hand, compact development reduces sprawl, allows for more efficient use of and preservation of land resources, is associated with lower infrastructure cost per capita, and reduces long commutes (and consequently greenhouse gas emission), among other benefits. For example, transport infrastructure and utilities are more costly to provide and maintain in low-density development scenarios. Efficient

Figure 2.22: Population density in cities in 1990 and 2020 and in three different scenarios in 2050 by income group and SDG region (density in inhabitants per sq. km)



public transport depends on sufficient demand at each public transport stop, which is difficult to provide in low-density neighbourhoods.

Well-designed and contextually supported densification and compact development are important for the various classes of cities discussed in this chapter and are in line with the “optimistic” vision of the future outlined in Chapter 1. Cities should therefore aim for sufficient density with adequate activity mix, while still providing important public amenities such as parks, squares, sports grounds and cultural venues, as well as good transport infrastructure, to ensure connectivity at the city and regional level.⁴⁵ These public spaces play a vital role of making density work. The COVID-19 pandemic, for instance, has reinforced the value of quality public spaces, walkability, proximity and enhanced accessibility.⁴⁶

All of these preferences call for responsive urban and territorial planning that anticipates and effectively addresses the demand for city expansion.⁴⁷ They also call for the public sector to embrace a fundamental set of actions that will ensure an orderly urban expansion (Box 2.7).⁴⁸ On the other hand, however, weaknesses in planning and institutional frameworks will perpetuate sprawl or lead to densification that results in overdevelopment and crowding (and its associated adverse health outcomes), gentrification, poor air quality and noise pollution, among other problems, that make sustainable urban futures elusive and bring to

fruition the “high damage” and “pessimistic” scenarios alluded to in the previous chapter.

Globally, cities would occupy less land and host more people under the high-density scenario, but as shown above it would force the already high population density in low-income cities even higher. On the other hand, low-income countries would need five times the amount of land for their cities in the low-density scenario (Figure 2.23). Low-density development would require massive infrastructure investments to provide services and access to all the new neighbourhoods in low-income countries. So many cities would more than double in area under the low-density scenario (Map 2.3) that it would be extremely difficult for governments in lower-income countries to finance the necessary infrastructure. The World Cities Report 2020 already outlined the challenge of financing urban infrastructure in these countries. Still, the moderate- or high-density scenario would imply a tripling or doubling of city land in low-income countries.

In upper-middle- and high-income countries, the growth in city population is lower and cities are less dense. As a result, they can accommodate more people in their cities without any need to increase the amount of land. In some cities, the amount of city land could even shrink (Map 2.4), especially in Eastern Asia.

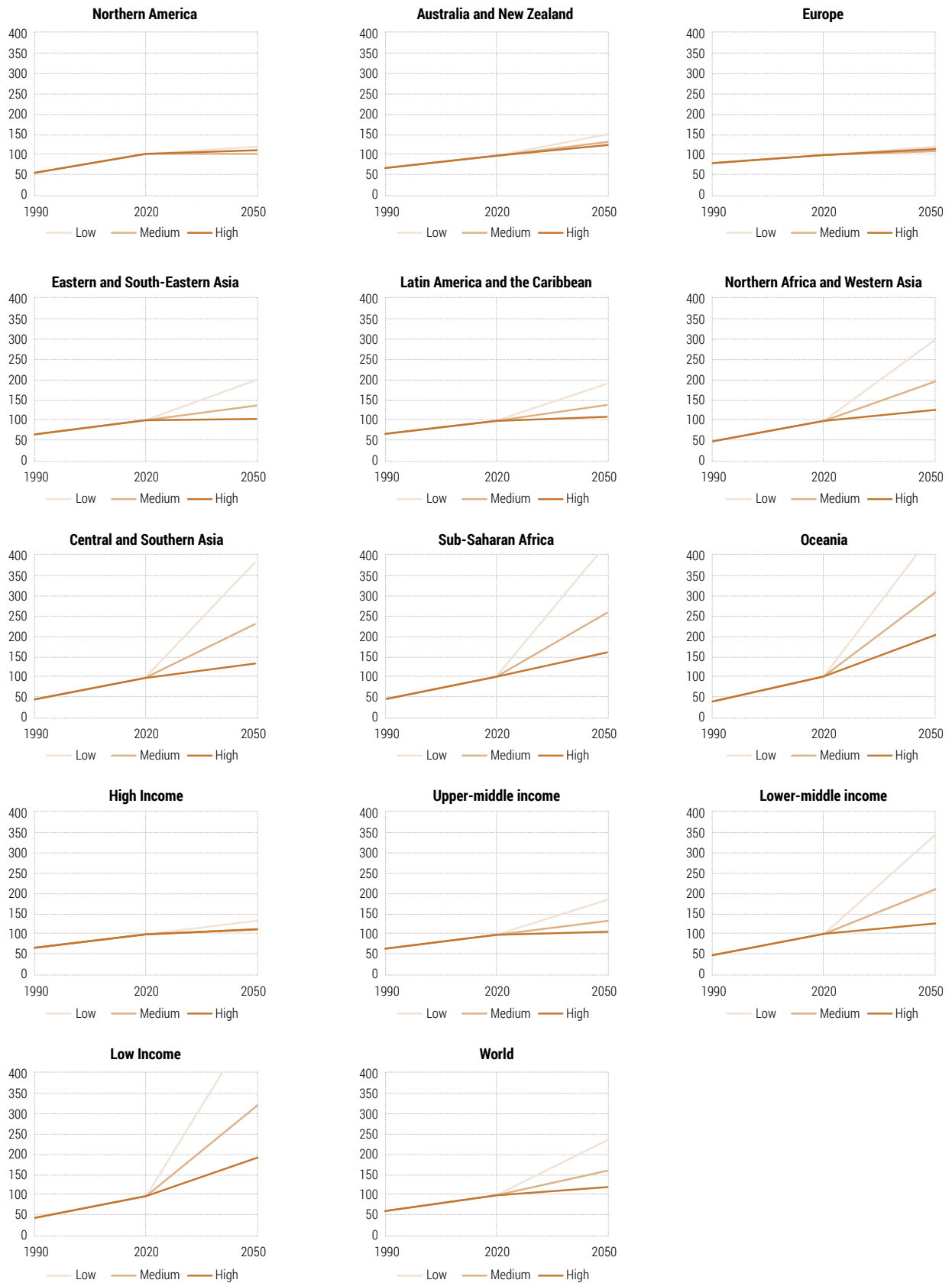
Box 2.7: Making room for future urban expansion: Minimal actions

In preparing rural areas in the periphery of growing cities for urban development, the public sector should undertake the following fundamental actions:

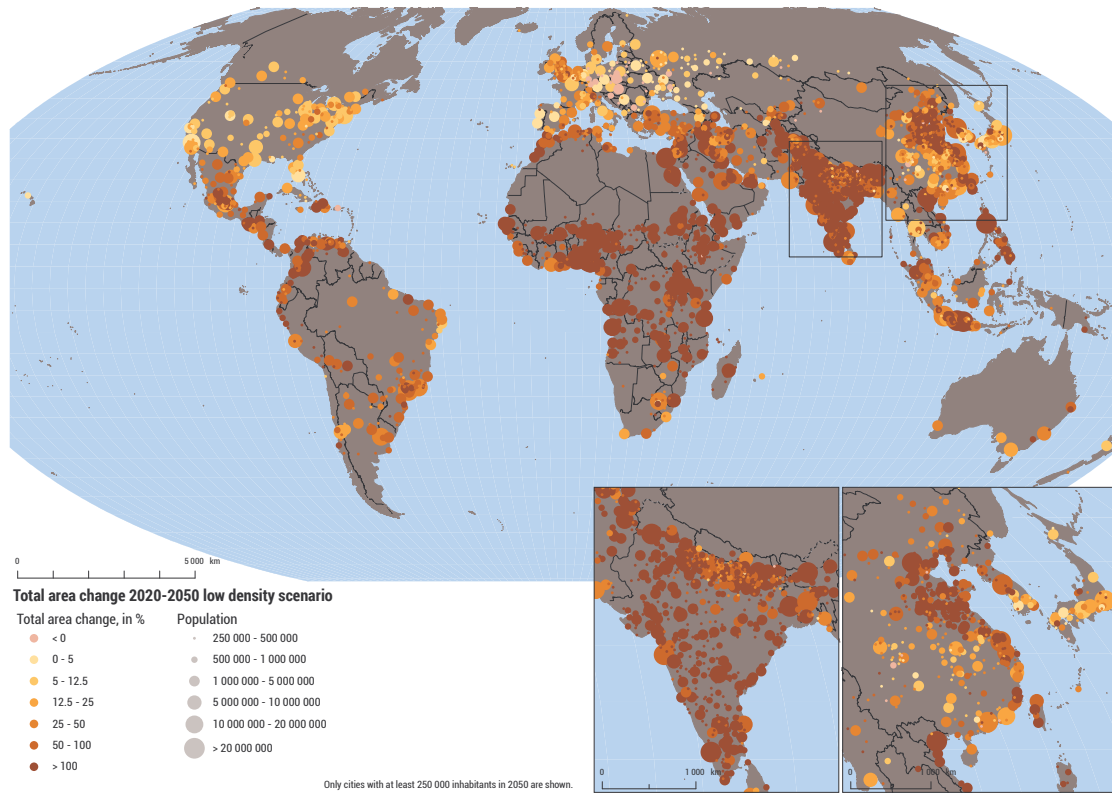
- i estimating the amount of land required for development during the next three decades and identify potential expansion areas;
- ii protecting areas of environmental risk as well as a hierarchy of public open spaces from development;
- iii laying out and securing the rights-of-way for a future arterial infrastructure grid that can carry public transport throughout the projected expansion area; and
- iv fostering the proper subdivision of lands—to rectangular or near-rectangular plots, where possible—by all suppliers of commercial and residential lands, with special attention given to informal housing developers, so as to prevent rural lands converted to residential use from becoming and remaining “slums,” and facilitating their transformation into regular residential neighbourhoods.

Source: Angel et al, 2021.

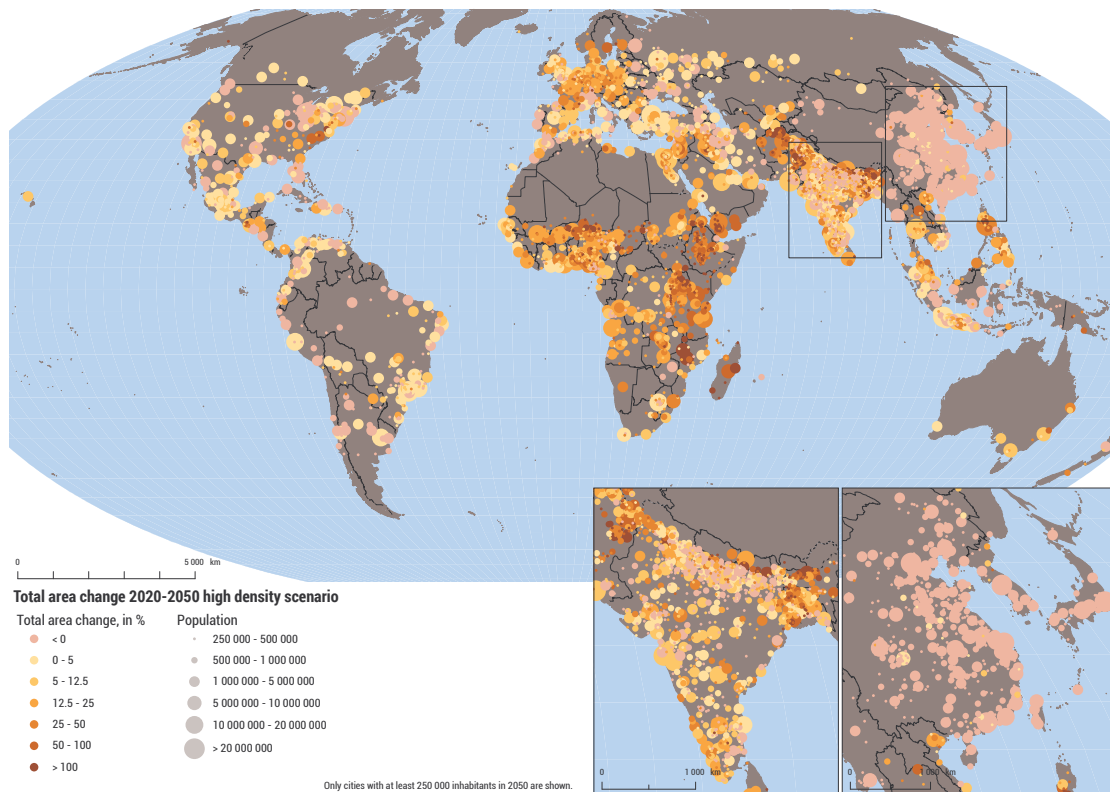
Figure 2.23: City land in 1990, 2020 and in three scenarios in 2050 by income group and SDG region (city land in 2020=100)



Map 2.3: Total area change per city in a low-density scenario, 2020–2050



Map 2.4: Total area change per city in a high-density scenario, 2020–2050



2.6. Concluding Remarks and Lessons for Policy

This chapter, using harmonized data from the Degree of Urbanization approach, shows that the global population share in cities has been increasing continuously, but that the rate of increase has slowed down. About one-quarter of the world population lived in cities (as defined by this approach) in 1950 and this figure grew to almost half the population in 2020. Going forward, a further increase to almost 60 per cent in 2070 is projected. This essentially denotes that the biggest increases in the share of people living in cities is already behind us.

The chapter has further illustrated that city population in low-income countries has been growing much faster than in other countries due to much higher overall demographic growth and a faster increase in the city population share from a low base. As a result of these dynamics, the amount of land covered by cities in low-income countries has grown much faster over the years. It doubled between 1975 and 2020 and is projected to do so again by 2070, a clear indication of the need for policymakers in these countries to focus on managing this spatial growth with sound policies that promote compact development as well as mitigate the negative social, economic and environmental impacts of dispersed urban growth where it is recorded. In contrast, this chapter has also shown that city land in higher-income countries is projected to increase moderately by between 10 per cent and 50 per cent over the same period.

Population growth in cities is primarily driven by natural growth, while rural-to-city migration has a smaller impact. This is especially the case in low-income countries, where natural population growth explains two-thirds of city population growth.

As cities grow, they tend to expand spatially into surrounding suburban and rural areas and to annex nearby towns. This chapter has illustrated that both of these factors contribute to the growth of city population, especially in high-income countries where many cities are surrounded by large suburban areas. In low-income countries, however, the chapter has shown that expansion and annexation adds relatively little to city population growth, in part due to high overall population growth rates and a relative absence of suburban areas.

In terms of various population cohorts, the chapter has shown that the estimated share of children in rural areas tends to be higher than in cities in low-income and lower-middle-income countries. This has been the trend over the past decades, it presently is so, and projection to 2050 shows that it will remain that way. In high-income countries, however, this trend is changing from slightly higher share in rural areas in 1950 to a lower share in rural areas in 2050. The chapter further records that young adults prefer city living across countries within all four income groups, while only in high-income countries do people over 65 move to the rural areas.

The chapter has also vividly shown that concentration of city population in the largest cities tends to be higher in more developed countries, when taking into account the population size of a country. Further, it has illustrated that low-income countries have a higher share of their city population and city land in small cities as compared to higher-income countries.

Given the rapid growth of city population in low-income countries, the type of urban development will have a big impact on the shape of cities. For sustainable futures to be realized in these places, policy measures that incentivize compact and moderate- or high-density development—which allow more people to live in cities, while using less land—should be implemented. It is worth noting that significant spatial expansion is inevitable in these countries—even under a higher-density development scenario, city land in low-income countries is projected to double in the 2050s.

Finally, this chapter has emphasized the need for urban and territorial planning that anticipates and responsive to effectively mitigates the negative social, economic and environmental associated with this growth. The growth of city land in low-income countries will require substantial efforts in terms of both planning and infrastructure investments. Planning should be undertaken ahead of this expansion of cities to halt informality and ensure that there is policy coherence at various scales guiding the needed investments. In the absence of this, low-density city development that will see city land in low-income countries increase by a factor of five. This sprawl, compounded by informality, will be extremely challenging to manage, inhibiting the pursuit and realization of sustainable futures.

Endnotes

1. EU, FAO, ILO, OECD, UN-Habitat and the World Bank.
2. European Union et al, 2021.
3. National Research Council, 2003.
4. GHS-POP (https://ghsl.jrc.ec.europa.eu/ghs_pop.php); Applying this to other global population grids such as World Pop will produce slightly different share, but the overall pattern remains the same. www.worldpop.org
5. Dijkstra et al, 2021.
6. UNDESA, 2001.
7. Montgomery, 2008.
8. Lutz et al, 2018; UNDESA, 2019c; Vollset et al, 2020.
9. Bocquier and Costa, 2015; De Vries, 2013; Dyson, 2011; Zelinsky, 1971.
10. UNDESA, 2001; Dyson, 2011; Stecklov, 2008; Davis, 1965.
11. UN-Habitat, 2016a.
12. UN-Habitat, 2020a.
13. Brückner, 2012; Barrios, Annez, P., R. Buckley and J. Kalarickal, 2010; Bertinelli and Strobl, 2006; Fay and Opal, 1999.
14. Resource-rich coastal cities, urban atoll islands, densely populated deltas and Arctic communities are most threatened (IPCC, 2022b); in some countries (e.g. China) the expansion of cities in coastal and delta regions has been notable (McGranahan et al, 2007).
15. UNDESA, 2019b.
16. Fuller and Romer, 2014.
17. UNDESA, 2019c.
18. UNECOSOC, 2019; UN-Habitat, 2019a; Lincoln Institute of Land Policy, 2016.
19. UN-Habitat, 2018b.
20. This section only provides a global overview. It is worth noting that not all cities are experiencing population growth; some are experiencing shrinkage. Subsequent sections of this chapter, Chapter 1 and previous UN-Habitat flagship reports highlight this phenomenon.
21. Farrell, 2017; Farrell, 2018; Farrell and Westlund, 2018; Menashe-Oren and Stecklov, 2017; Montgomery, 2008; Stecklov, 2008.
22. Menashe Oren and Bocquier, 2021.
23. Jiang et al, 2021; Jones et al, 2020.
24. Roberts, 2014.
25. UNICEF et al, 2020.
26. European Commission and LSE, 2000.
27. Rogers et al, 2002.
28. Bloom et al, 2003.
29. Urdal and Hoelscher, 2009.
30. UN-Habitat, 2008.
31. Glaeser, 2014.
32. First, the population of each city is expressed as a share of the total city population. Second, each of those shares is squared. Finally, these squared shares are summed. High numbers indicate high primacy. Henderson, 2000.
33. UN-Habitat, 2021a.
34. UNDESA, 2019b.
35. UN-Habitat, 2020a; UN-Habitat, 2020b; UN-Habitat 2010.
36. Mudau et al, 2020.
37. Agyemang et al, 2019; Yiran et al, 2020; UN-Habitat, 2009.
39. UN-Habitat, 2008.
40. UN-Habitat, 2008.
41. Ortiz-Moya, 2020; City of Kitakyushu and Institute for Global Environmental Strategies, 2018.
42. UN-Habitat, 2020a.
43. UN-Habitat, 2019b.
44. Angel et al, 2020.
45. UN-Habitat recommends a minimum of 15,000 inhabitants per square kilometre (UN-Habitat, 2014).
46. OECD, 2020b.
47. UN-Habitat, 2014.
48. Angel et al, 2021.

