Assessment of global megatrends — an update

Global megatrend 2: Towards a more urban world

European Environment Agency

Cover design: EEA
Layout: EEA/Pia Schmidt

The present chapter was authored by Anita Pirc Velkavrh and Michael Asquith, based on the background report from BIO Intelligence Service (http://www.eea.europa.eu/publications/global-megatrend-update-1/increasing-divergence-in-global-population-trends) and contributions from Teresa Ribeiro, Tobias Lung and Gorm Dige.

Background report: Bio Inteligence, Tanja Münchmeyer, Shailendra Mudgal, Targeted support to the update of analysis of global megatrends for the European Environment State and Outlook Report 2015 Global megatrends assessment, Living in an urban world: Analysis for update and improved assessment of this megatrend, 2013.

European Environment Agency
Kongens Nytorv 6
1050 Copenhagen K
Denmark
Tel.: +45 33 36 71 00
Fax: +45 33 36 71 99
Web: eea.europa.eu
Enquiries: eea.europa.eu/enquiries

Assessment of global megatrends — an update

Global megatrend 2: Towards a more urban world

European Environment Agency

Assessment of global megatrends — an update

Europe is bound to the rest of the world through an enormous number of systems — environmental, economic, social, political and others. Such networks enable complex flows of materials and ideas across the globe, producing uncertain feedbacks and knock-on effects over time. Greenhouse gas emissions in Europe today can affect the climate in distant locations and far into the future. Land management choices on the other side of the world can influence food and energy prices in Europe. Global communication and trade networks fuel innovation — sometimes boosting efficiency, sometimes creating new environmental pressures.

Most of these interactions are intimately linked and set to unfold over decades. All are likely to have important implications for living standards and well-being.

The European environment's status, trends and prospects have always depended in part on events outside its borders. Yet the growing importance of global networks and flows has augmented this interdependence, creating complex challenges for traditional governance systems framed within national or regional territories. To design effective ways to manage the environmental changes ahead, societies and governments need to understand the global drivers at work and their potential implications.

With this challenge in mind, the European Environment Agency in 2010 produced its first assessment of emerging global trends as part of its five-yearly flagship report on the European environment's state and outlook (SOER 2010). The exploratory analysis summarised 11 global megatrends grouped into five clusters — social, technological, economic, environmental and governance. Introducing the issues succinctly, it sought to trigger a discussion about how Europe should monitor and assess future changes in order to better inform environmental policymaking.

In preparation for its next report on the European environment's state and outlook (SOER 2015), the EEA has initiated an update of the assessment of global megatrends, analysing each of these drivers in a little more detail than previously in terms of their impacts on the European environment and well-being. During the second half of 2013 and early-2014, the EEA is reassessing the 11 megatrends and publishing the updates separately on its website. In 2014, the chapters will be consolidated into a single EEA technical report and will provide the basis for the analysis of megatrends included in SOER 2015. The present chapter addresses megatrend 2: 'Towards a more urban world'.

Again, it needs to be emphasised that the complexity of highly interconnected human and natural systems introduces considerable uncertainty into projections and forecasts. As much as anything, the assessment of megatrends aims to encourage readers to acknowledge this interdependence and uncertainty. In so doing, it may help point the way towards systems of planning and governance better adapted to meeting the challenges ahead.

Global megatrend 2
Living in an urban world

Urbanisation is an integral aspect of development. As countries transition from primarily agricultural economies, the shift to cities offers substantial productivity gains. Jobs and earnings in urban settings create strong incentives for internal migration, often reinforced by government policies and environmental degradation. Only later in economic development do urban-rural disparities begin to dissipate, easing the pressure for further urbanisation.

Together, these drivers have brought extraordinary changes to the geographical distribution of humanity during the last century. Whereas just 10–15 % of the global population lived in urban areas in the early 20th century, that figure had risen to 50 % by 2010 (WBGU, 2011) and is projected to reach 67 % by 2050 (UN, 2012). Almost all of that growth is expected to occur in today's developing regions, with urban populations there increasing from 2.6 billion in 2010 to 5.1 billion in 2050.

At the individual level, urbanisation can boost opportunities and living standards. At the macroeconomic level, cities drive innovation and productivity. But while the associated growth of the middle class is welcome, it also carries risks in terms of rapidly growing burden of resource use and pollution. Dense urban settlements can provide for comparatively resource-efficient ways of living but exploiting this potential and creating a healthy, secure living environment requires effective urban planning. Indeed, the consequences of ill-managed urbanisation are apparent in the vast slums that today accommodate a quarter of the world's urban inhabitants — more than 850 million people.

2.1 Key drivers of urbanisation

Urbanisation ([1]) — growth in the proportion of a population inhabiting towns and cities — is the result of multiple, interrelated drivers. As detailed in this section, these drivers tend to evolve as urbanisation progresses, enhancing or mitigating rural-urban disparities in living standards and opportunities.

Increased opportunities in cities as countries industrialise

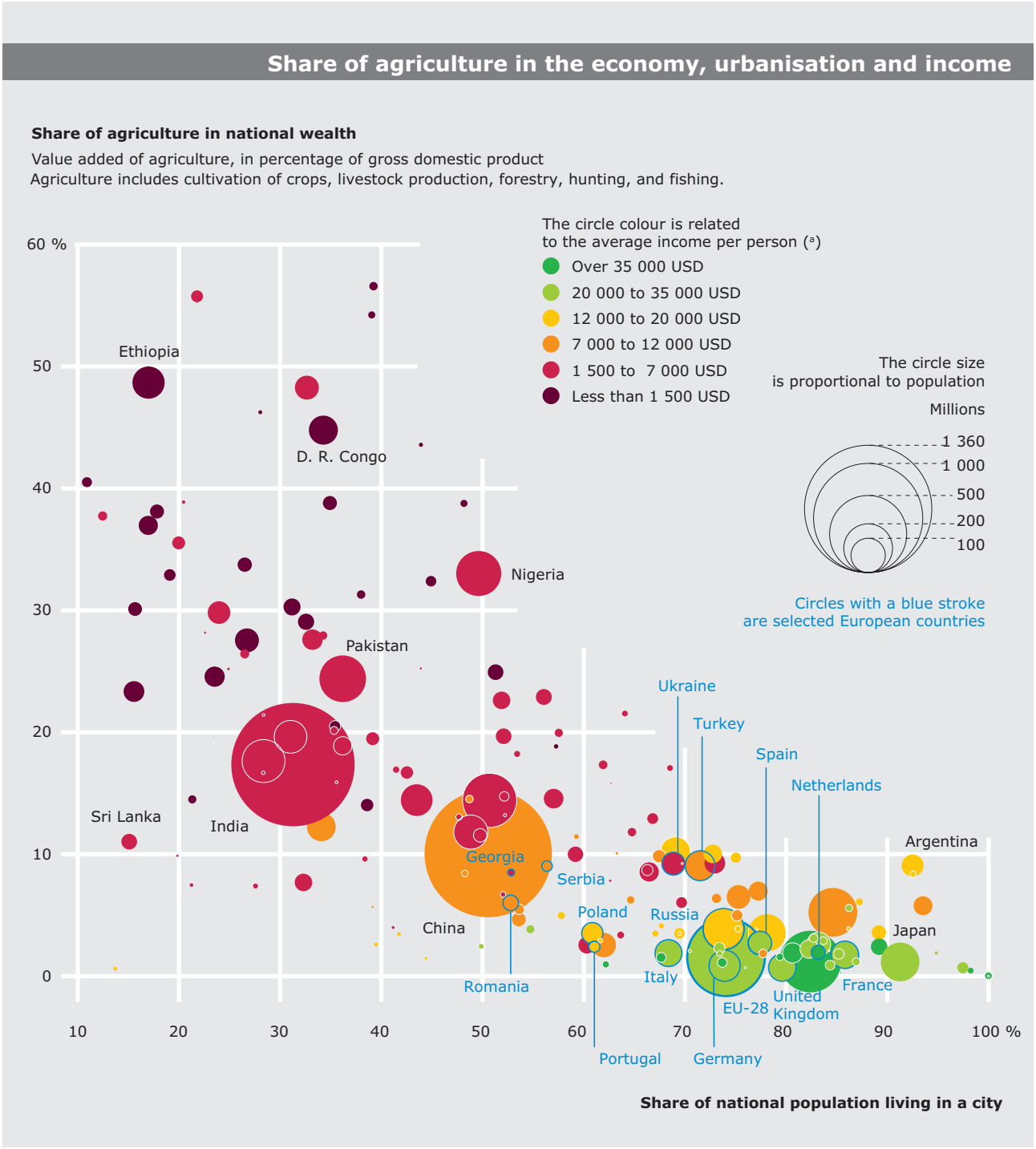
Across the world (although at different times) the shift to cities has initially been catalysed by changes in the agricultural sector (Figure 2.1). Innovations such as crop rotation, fertiliser and pesticide use, selective breeding and mechanisation have greatly enhanced food production, enabling far fewer farm workers to meet the food requirements of growing populations. The resulting pool of surplus labour allows countries to evolve towards industrialised and, later, service-based economies. Urbanisation is an essential element in this transition (Kuznets, 1960; World Bank, 2009).

Industrialisation brings urbanisation because of the benefits that businesses, workers and consumers derive from proximity. Cities make it easier for companies to benefit from two related forms of cost savings: internal scale economies, and external scale economies (or 'economies of agglomeration'). The former occur where expanding production in a single company enables cost savings (e.g. by boosting bargaining power for inputs, reducing average fixed costs, and facilitating division of labour). Cities can support internal economies of scale by providing ready access to a large pool of suppliers and skilled workers (World Bank, 2009).

Economies of agglomeration arise through the collocation of multiple companies. This can bring the firms a range of benefits, including attracting customers and skilled workers; fostering the diffusion of innovation; enabling sharing of ideas and information within the labour market; spreading fixed infrastructure costs over more taxpayers; and providing dense local markets for inputs and outputs of production, minimising transport costs. Agglomeration can also support specialisation, enhancing opportunities for innovation and cost saving (Quigley, 2008).

([1]) 'Urbanisation' is growth in the proportion of people living in urban areas. 'Urban growth' relates to the increase of populations living in urban areas, and therefore comprises both relocation of rural populations to cities and also natural population growth in cities.

Figure 2.1 Economic development entails a shift from farming to cities



Notes: (a) Gross Domestic Product by Purchasing Power Parities, in international dollars, at fixed 2005 prices.

The inflation and differences in the cost of living between countries has been taken into account.

Please note that European Union countries are represented both individually and collectively (EU-28).

The figure illustrates the correlation of economic development (represented in terms of GDP per capita in PPP terms) with agriculture and urbanisation. Agriculture can account for 50 % or more of economic output in the countries with the lowest living standards and the populations are primarily rural. In the countries with the highest living standards, urban dwellers often account for more than three-quarters of the population and agriculture plays a minimal role in economic output.

Source: World Bank; UN Population Division; Gapminder; 2013. Agriculture data for 2012 (or most recent value available), urbanisation data for 2011, population data for 2013, income data for 2012 (or most recent value available).

The effect of these two forms of scale economies is to boost earnings in cities. Research suggests, for example, that when a city's population doubles, economic productivity increases by 130 % due to the increased opportunities for interaction afforded by greater urban population density (MIT, 2013).

Turok and McGranahan (2013) stress, however, that 'there is no simple linear relationship between urbanisation and economic growth, or between city size and productivity'. This is partly because the concentration of people and business activity in urban settings can generate substantial costs, offsetting the advantages of agglomeration. These costs include congestion, overcrowding, pressures on infrastructure and ecosystems, and higher costs of living, labour and property in cities. City planning and sufficient investment in infrastructure are therefore key in determining the returns to agglomeration.

Relative decline in rural opportunities and living standards

As countries transition from primarily agricultural systems towards industrialised economies, rural areas tend to see weaker growth in productivity and earnings than cities. This partly reflects the fact that the accumulation of capital in cities allows significant productivity increases, while labour surpluses persist in rural areas (World Bank, 2009). But in many developing countries government interventions into the agricultural sector also contribute to rural poverty. Examples of such policies include an urban bias in public investments, state administration of agricultural product prices and exchange rates, and rules favouring export crops over food crops (Khan, 2001).

These forces can contribute to sharp income differentials between rural and urban populations. In China, for example, average household incomes are now nearly three times higher in urban than in rural areas (Turok et al., 2013). Such disparities are at the core of the incentives driving the shift from rural areas to cities. They extend beyond employment opportunities and income levels to a range of other aspects of development, including access to education, health services and amenities (World Bank, 2009). Today, urban areas account for 80 % of the world's economic output (UN, 2012) and this wealth, coupled with the density of urban settlements, provides city dwellers with access to diverse social and cultural opportunities.

As economic development progresses, rural-urban disparities tend to diminish. This is partly because the flow of workers to cities reduces surplus agricultural labour and alleviates competition among rural workers, increasing productivity and per capita earnings. In addition, increasing government capacity and fiscal redistribution also tend to play a role (World Bank, 2009).

India's wage structure, for example, used to be characterised by a significant difference in wages but this gap in wages is now narrowing (Hnatkovska and Lahiri, 2013). The World Bank (2009) finds that disparities in access to clean water and sanitation services tend to diminish at high levels of urbanisation and per capita GDP (Table 2.1).

Environmental change and government policy

Environmental degradation (often linked to economic systems of production and consumption) plays an increasingly important role in internal

Table 2.1 Rural-urban disparity in access to clean water and sanitation

Urban population share	Disparity in access to clean water (percentage points)	Disparity in access to sanitation (percentage points)	Examples of countries in this sample
75 %	8	8	United States, Norway, Switzerland, Spain, Germany, Canada, Mexico, Chile, Brazil, Argentina, Gabon, Venezuela, Djibouti, Lebanon, Jordan, United Kingdom
50–70 %	15	20	Estonia, Panama, Turkey, Hungary, Ecuador, Colombia, Malaysia, Syria, Azerbaijian, South Africa, Congo, Algeria, Tunisia, Bolivia
25 % or lower	24	26	India, Yemen, Madagascar, Chad, Tajikistan, Bangladesh, Tanzania, Kenya, Nepal, Cambodia, Malawi, Uganda, Sri Lanka, Bhutan

Source: World Bank, 2009.

Box 2.1 Uncertainties in future drivers of urbanisation

Looking ahead, resource consumption trends could reinforce the tendency towards improving rural earnings. Economic growth has historically been based on cheap and abundant resources but prices of energy, food and metals have all increased sharply in recent years (GMT 7). At present it is often profitable to convert agricultural land into urban land but increasing demand for cash crops could increase the value of rural land and labour (IIED, 2012). Government measures (e.g. removal of price controls in agricultural product markets and investment in infrastructure) can also boost earnings and incentivise productivity increases (Kherallah et al., 2002).

Technological leapfrogging — resulting from foreign investment, development assistance or domestic innovation — also has the potential to influence the incentives driving urbanisation. Development of new energy, transportation and communication technologies could boost economic opportunities and living standards in rural areas, affecting migratory pressure towards urban areas. Increased demand for bioenergy crops, for example, could enhance rural incomes (in part by increasing food crop prices). However, it could also increase pressures on natural capital, creating uncertain impacts on well-being (de Nie et al., 2009).

Similarly, development of decentralised energy production systems could augment rural access to basic services such as lighting and water pumping, and increase opportunities for income-generating activities, further decreasing migratory pressures. On the other hand, experience suggests that technological innovation does not always alter incentives as expected. Despite the development of ever more sophisticated communication technologies (from the telephone to the internet and videoconferencing), firms and workers are still willing to bear the costs of agglomeration because of the enormous benefits if offers, including human capital spillovers and cultural complexity (Glaeser, 2009).

migration. Climate change can have particularly severe impacts on rural inhabitants as they tend to depend heavily on activities and resources that are especially sensitive to climatic variables (Hunter, 2007). As temperatures or precipitation patterns change, some areas that currently offer favourable conditions for such climate-sensitive activities could see productivity decline (Chavas et al., 2009; see also GMTs 8 and 9).

Government interventions can also contribute to environmental change, in some cases making areas uninhabitable. A prime example is the policy of hydroelectric dam construction in China. During the 1950s and 1960s, China moved some 7.8 million people to make way for dam construction. More recently, the Three Gorges Dam has been a major driver of migration to cities. In 2007, it was reported that at least 4 million people will be relocated from the Three Gorges Reservoir area in coming years (Gleick, 2008).

Recognising the human and economic costs that can arise, many governments have introduced policies to manage urbanisation. In 2005, 73 % of low-income countries had put policies in place to lower migration to cities. In most cases, however, these attempts have not been successful (UN, 2011a).

2.2 Urbanisation trends

Contrasting urbanisation trends across the globe

Humanity's shift from the countryside to cities has been remarkably rapid. Whereas just 10–15 % of the global population lived in urban areas in the early 20th century, that figure had risen to 50 % by 2010 (WBGU, 2011). In absolute terms, that represented a 20-fold increase, from around 165 million city dwellers to 3.5 billion. Today the growth of cities continues apace, with urban populations expanding by 1 million persons each week (WBGU, 2011).

The global population today exceeds seven billion and is expected reach 9.6 billion by 2050 according to United Nations medium-variant projections (see GMT 1). Urban populations are expected to grow even faster in both relative and absolute terms, reaching 6.3 billion in 2050 (about two-thirds of the world population).

Beneath these global trends lie substantial regional differences in the extent and pace of urbanisation. Developed regions tend to be highly urbanised, with modest growth in urban populations projected in the coming decades. The least developed countries tend to have relatively small but rapidly increasing

urban populations — a result of both internal migration and rapid natural rates of population growth (see GMT 1).

In 2010, northern America had the highest proportion of its population living in cities (82 %), followed by Latin America and the Caribbean (79 %), Europe (73 %) and Oceania (71 %). Asia and Africa currently have the lowest urbanisation levels with 44 % and 39 % respectively. In 2010 city dwellers accounted for 78 % of the population in developed regions, 46 % in developing regions and 26 % in the least developed regions (UN, 2012). Figure 2.2 presents the national urbanisation levels in 2010.

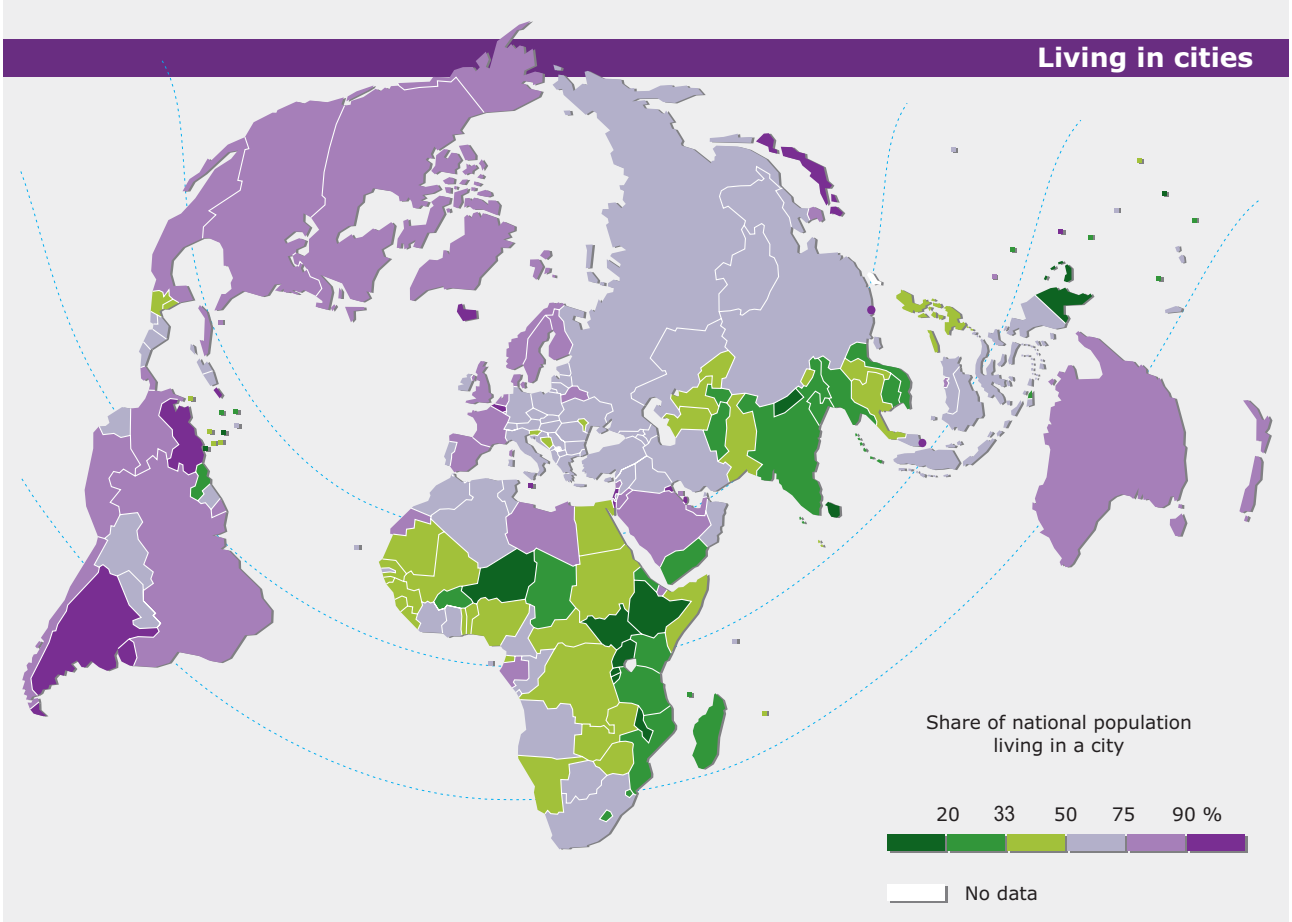
Two waves of urbanisation

Global urbanisation trends can be crudely divided into two 'waves'. The first began in Europe and North America in the early 18th century. Between 1750 and 1950, these regions experienced the first demographic transition, with urban populations increasing from 15 million (10 % of the total population) to 423 million (52 %) (UNFPA, 2007).

Urban populations in today's developed regions continued to grow in the second half of the 20th century but at relatively low rates (Figure 2.3). Europe's urbanisation dropped to near zero in the 1990s before reverting to very modest growth in the last decade.

By 2010, 957 million people lived in urban settlements in developed regions and the percentage of city dwellers is expected to continue rising from 78 % to 86 %, adding a further 170 million people to the urban population in developed regions (UN, 2012). Nevertheless, these numbers are dwarfed by trends elsewhere .

Figure 2.2 National urbanisation levels in 2010

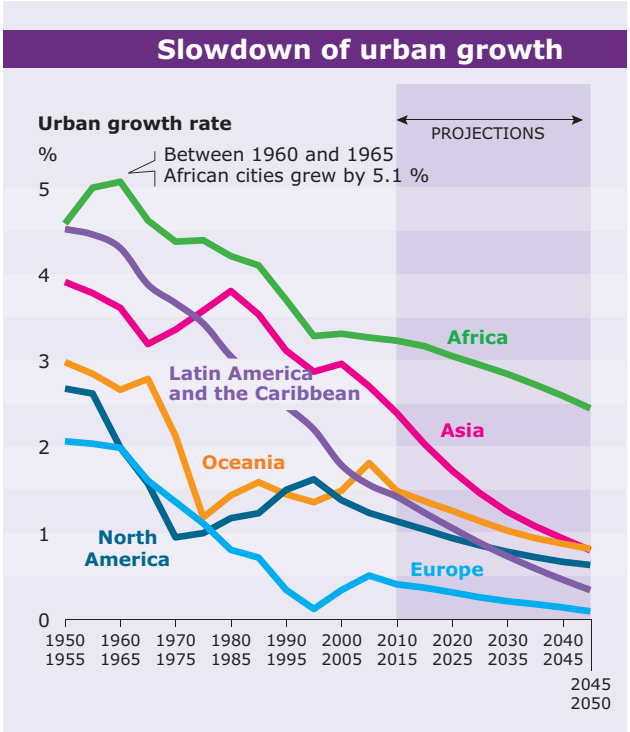


Source: UN Population Division, World Urbanization Prospects (2011 revision).

Commencing midway through the 20th century, the second wave of socio-economic transition has primarily affected today's developing regions. While the rates of change in these regions have been comparable to the earlier transition in Europe and northern America and are today declining, the size of populations in developing regions has brought urbanisation on an unprecedented scale. Many of the cities that will be created by the second wave do not even exist yet and many of the ones that do are ill equipped to handle these expansions. This can challenge the capacity of governments to plan and meet the needs of the rapidly growing number of urban dwellers.

Urban populations in developing regions rose from 309 million in 1950 to 2.6 billion in 2010 and are projected to reach 3.9 billion in 2030. It is estimated that in the 80 years between 1950 and 2030, the proportion of the population dwelling in cities in developing regions will increase from 18 % to 56 %. By 2050, the urban population in developing regions is projected to reach 5.1 billion — equal to 64 % of the total population (UN, 2012; Figure 2.3).

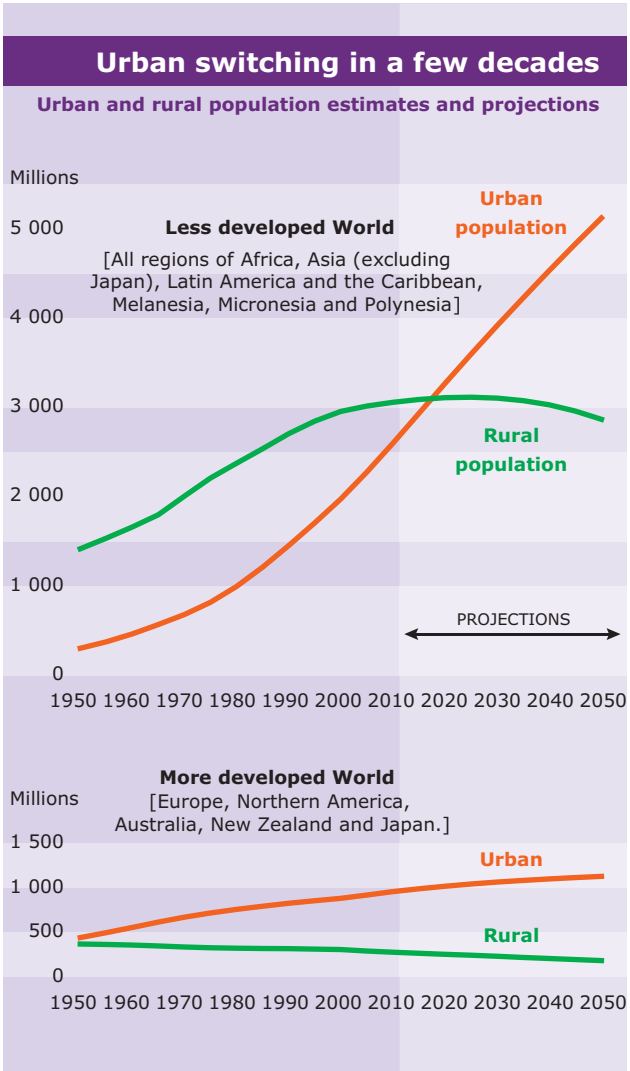
Figure 2.3 Unprecedented levels of urbanisation despite declining urban growth rates



Driven by high natural population growth rates, Africa had the highest urban population growth rate in the period 2005–2010, with an average annual growth of 3.4 % (Figure 2.3). Asia recorded the highest rate of urbanisation (i.e. the fastest increase in the percentage of the population living in cities).

According to UN estimates, Africa and Asia alone will account for 86 % of urban growth globally in the period 2010–2050 (UN, 2012). Even as far ahead as 2045–2050, the increase in city dwellers is projected to remain high in these countries, with an additional 25 million people per year in Africa and 35 million in Asia (Figure 2.4).

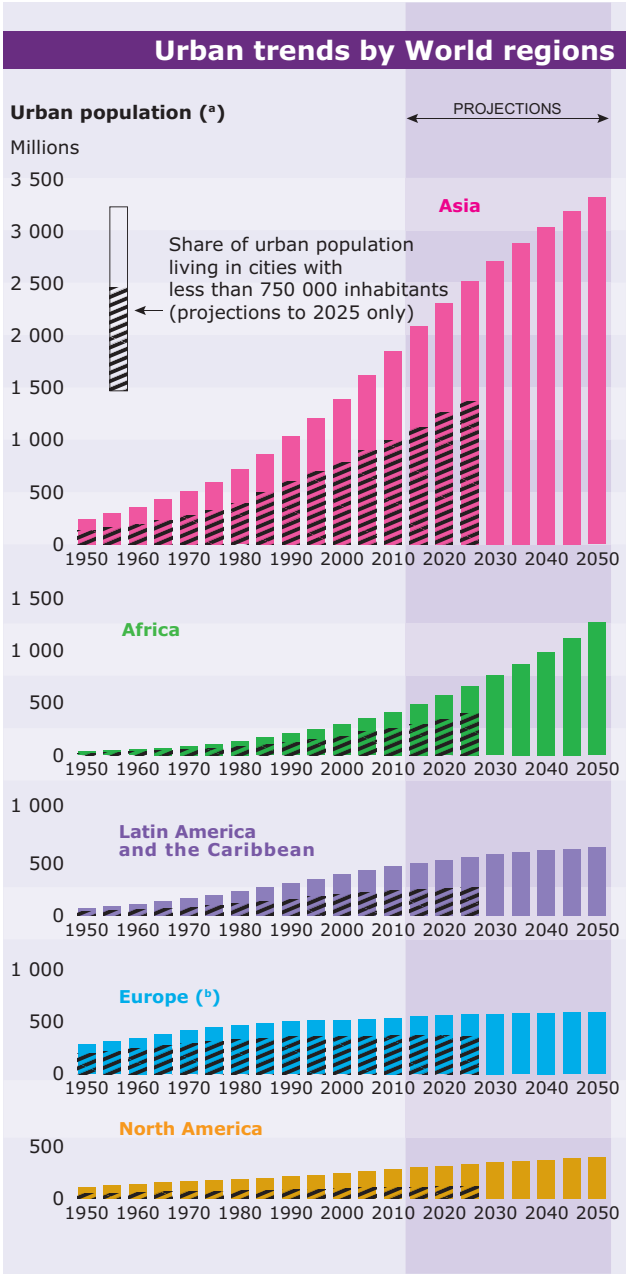
Figure 2.3 Unprecedented levels of urbanisation despite declining urban growth rates (cont.)



Note: Please note the five-year steps.

Source: UN Population Division, World Urbanization Prospects (2011 revision).

Figure 2.4 Africa and Asia will account for the greatest increases in urban populations



Notes: Urban areas of Oceania — are projected to reach 40 millions of urban population people by 2050 (currently 26 million). They are not included in the above graph for legibility reasons.

(a) The definiton of 'urban area' varies from one country to the next.

(b) EU-28 + Albania, Andorra, Belarus, Bosnia and Herzegovina, Channel Islands, Faroe Islands, Gibraltar, Holy See, Iceland, Isle of Man, Liechtenstein, Monaco, Montenegro, Norway, the former Yugoslav Republic of Macedonia, Moldova, Russia, San Marino, Serbia, Switzerland and Ukraine.

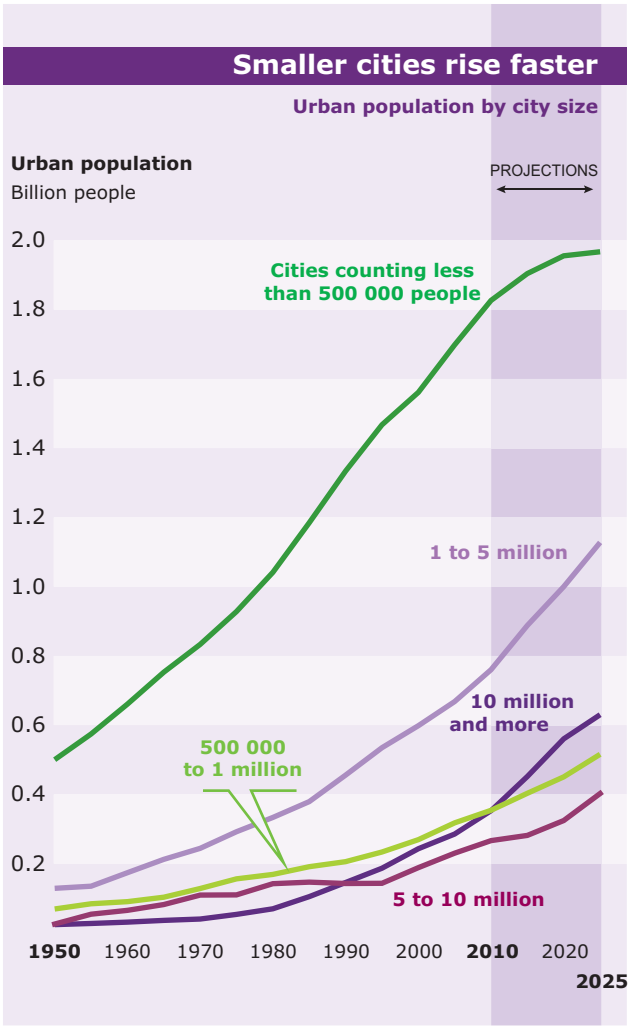
Source: UN Population Division, World Urbanization Prospects (2011 revision).

More megacities but small settlements still dominate

The increase in the total number of city dwellers has been accompanied by changes in city size. In 1900 there were 12 cities with more than 1 million inhabitants but by 2000 this number had reached 378. During the same period, the average size of the world's hundred largest cities increased from 700 000 to 6.3 million (Satterthwaite et al., 2010).

The emergence of megacities (i.e. cities with more than 10 million inhabitants) is equally striking. Whereas there were just two megacities in 1950, today there are 21, of which 17 are in developing regions. Nevertheless, the trend towards larger cities is certainly mixed. Only about 5 % (359 million) of the world population inhabited megacities in 2011,

Figure 2.5 Smaller cities have risen faster



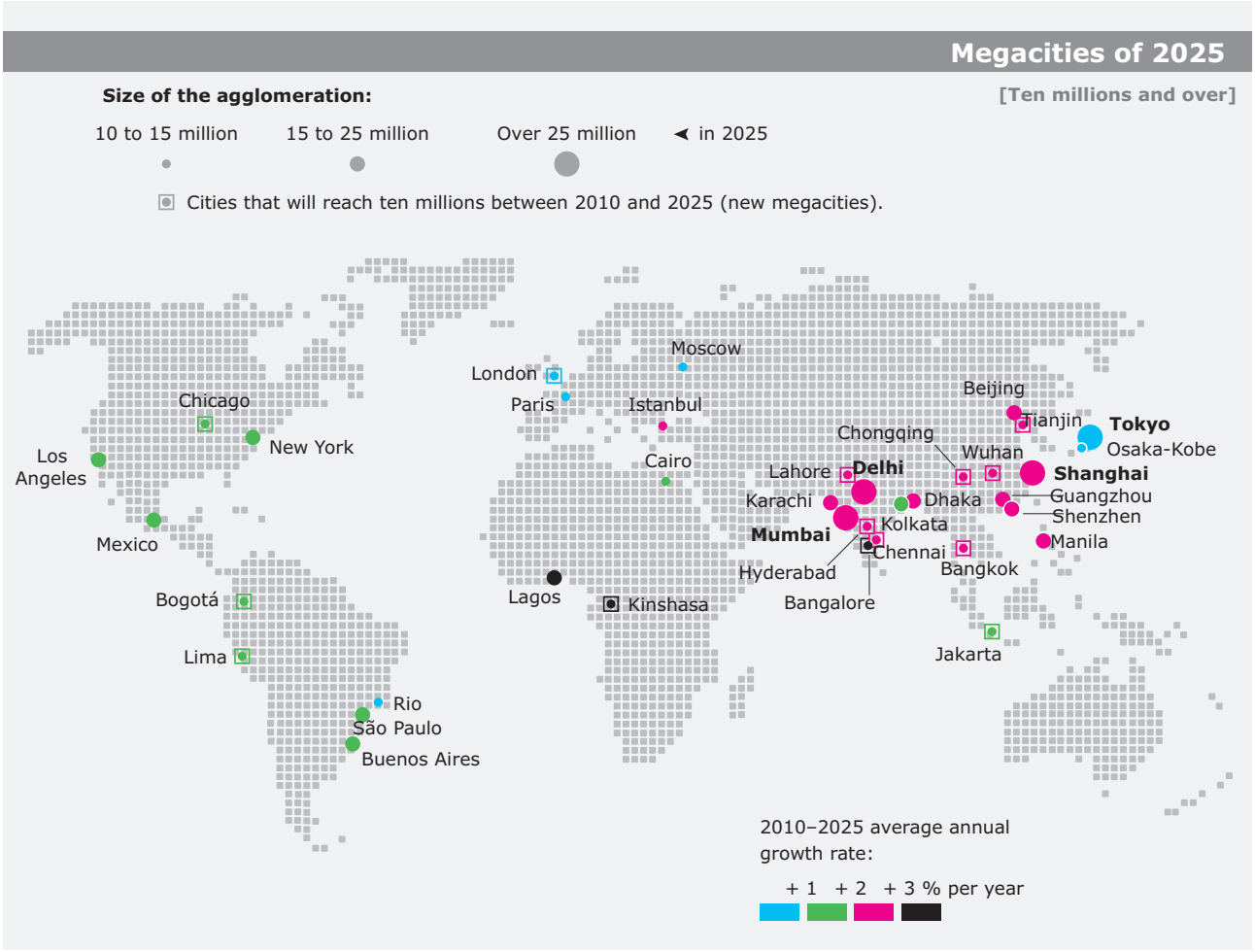
Source: UN Population Division, World Urbanization Prospects (2011 revision).

whereas 52 % (1 849 million) of the world's city dwellers reside in small urban settlements of less than 500 000 inhabitants (Figure 2.6).

Although the population in megacities is projected to double by 2025, the growth of megacities is not uniform. Satterthwaite et al. (2010) note, for example, that commencing in the 1970s some high-income countries have experienced 'demetropolitanisation' as people move from large to smaller cities and suburbs. Cities do not necessarily develop from small to megacity. Urbanisation has resulted in far more small and medium size cities than megacities (Figure 2.5.). For example, between 1990 and 2000, 694 new cities developed and only 52 developed into big cities of one to five million inhabitants.

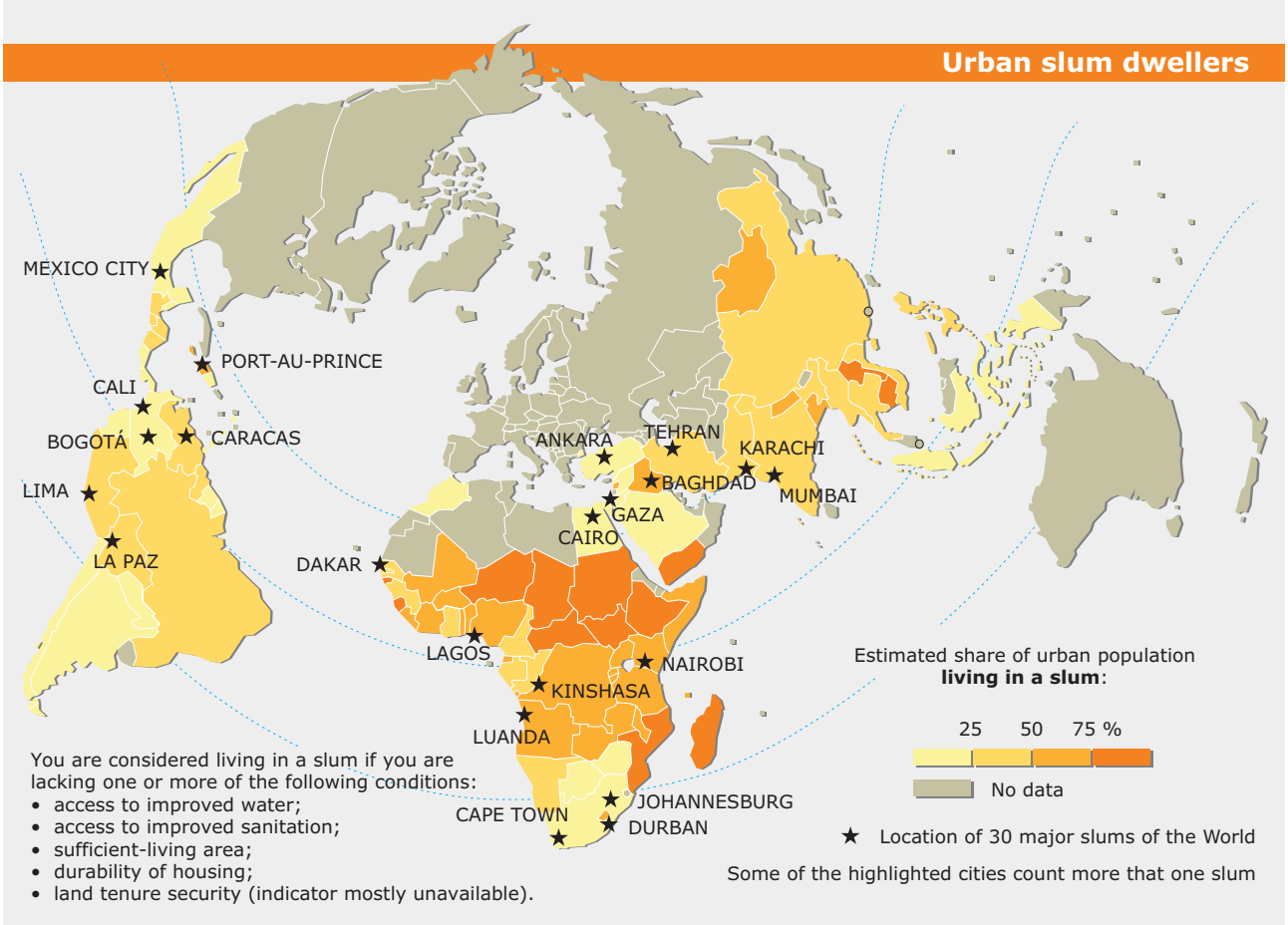
Significant regional differences have also developed in the size of agglomerations. Most African and European urban populations inhabit small cities of less than 500 000 inhabitants. In contrast, city dwellers in Asia, Latin America and the Caribbean and North America tend to live in significantly larger urban settlements (UN, 2012). As illustrated in Figure 2.6, the world's largest megacities are expected to be concentrated in south Asia and east Asia.

Figure 2.6 Total population in millions by city size class (1970, 1990, 2011 and 2025)



Source: UN Population Division, World Urbanization Prospects (2011 revision).

Figure 2.7 Percentage of national urban populations living in slums



Source: UN Habitat, *Global Report on Human Settlements 2013*. Data: 2005 to 2009 (for the data on the location of the 30 largest slums in the world) and Mike Davis, Planet of Slums, 2007.

Slum growth on an unprecedented scale

Slums are not new. They have been a counterpart of rapid urbanisation since at least the 17th century (de Soto, 2010) and the term 'slum' dates back to at least the 1820s (UN-Habitat, 2007). Rapid, unmanaged migration, often driven by poverty, combined with weak property rights regimes provide the ingredients for the formation of crowded informal settlements, lacking basic amenities such as clean water and sanitation ([2]). And the most rapid urbanisation is currently taking place in developing regions with the least capacity to manage effective urban planning and meet the needs of fast growing city populations.

While the formation of slums is not new, the scale and prevalence of today's slums is unprecedented. The population living in slums in developing regions totalled 863 million in 2012, up from 760 million in 2000, and 650 million in 1990 (UN-Habitat, 2013b). Slums thus account for approximately a quarter of the world's urban population and 33 % of the city dwellers in developing countries. In some regions and countries the proportions are much higher (Figure 2.7). In 2012, the percentage of urban populations inhabiting slums reached 62 % in sub-Saharan Africa and exceeded 90 % in some African countries (UN-Habitat, 2013b).

([2]) UN-Habitat (2013a) defines urban slum dwellers as 'individuals residing in housing with one or more of the following conditions: inadequate drinking water; inadequate sanitation; poor structural quality/durability of housing; over-crowding; and insecurity of tenure'.

Despite the growth in absolute numbers, however, the proportion of the urban population living in slums has declined sharply in recent years. For developing region as a whole, the percentage dropped from 46 % to 33 % in the period 1990–2012. And although sub-Saharan Africa's slum population accounted for 62 % of urban dwellers in 2012, that was a decline relative to 70 % in 1990. In some areas the decline was even more striking: from 44 % to 28 % in east Asia; from 57 % to 35 % in southern Asia; and from 50 % to 31 % in south-east Asia (UN-Habitat, 2013b).

2.3 Impacts of urbanisation

Urbanisation offers a complex mixture of opportunities and risks to individual living standards and societal well-being. At the macroeconomic level, cities can drive economic growth, boosting productivity and incomes. While the associated increase in resource use and consumption can increase pressure on the environment, dense urban settlements can also provide for comparatively resource-efficient lifestyles. Rural-urban migration can also generate significant costs, however, particularly when it occurs in an unplanned and unregulated way. The growth of slums, characterised by insecurity and poverty, is a major concern in developing regions. Equally, the concentration of people and businesses into urban areas can also significantly undermine living standards, for example via exposure to pollution.

Economic development and quality of life

The huge growth in urban populations is closely bound to the fundamental rebalancing of economic power globally (GMT 6) and associated social changes. Cities are on the forefront of economic wealth creation, as most innovation and paid employment tends to be located in urban areas. As illustrated in Figure 2.1 and 2.9, the extent of a country's urbanisation is closely correlated to its economic output. Cities are thus playing a central role in the emergence of the global consumer society, driven in particular by developments in the BRIICS countries, most notably China and India (Reusswig et al., 2003).

According to Kharas (2010), the number of middle class consumers could increase from 1.8 billion in 2010 to 4.9 billion in 2030, with Asia accounting for 85 % of that growth (see GMT 6) ([3]). China's middle class already numbers more than 150 million, making it second only to the US. And whereas India's middle class currently represents 5–10 % of its population, this is projected to reach 90 % within just 30 years (Kharas, 2010). As a result, the global distribution of middle class consumption has shifted significantly since 1965, with the US and the EU-15 accounting for a declining share. In the period 2011–2030, this evolution is projected to continue, with India and China in particular coming to the fore (Figure 2.8).

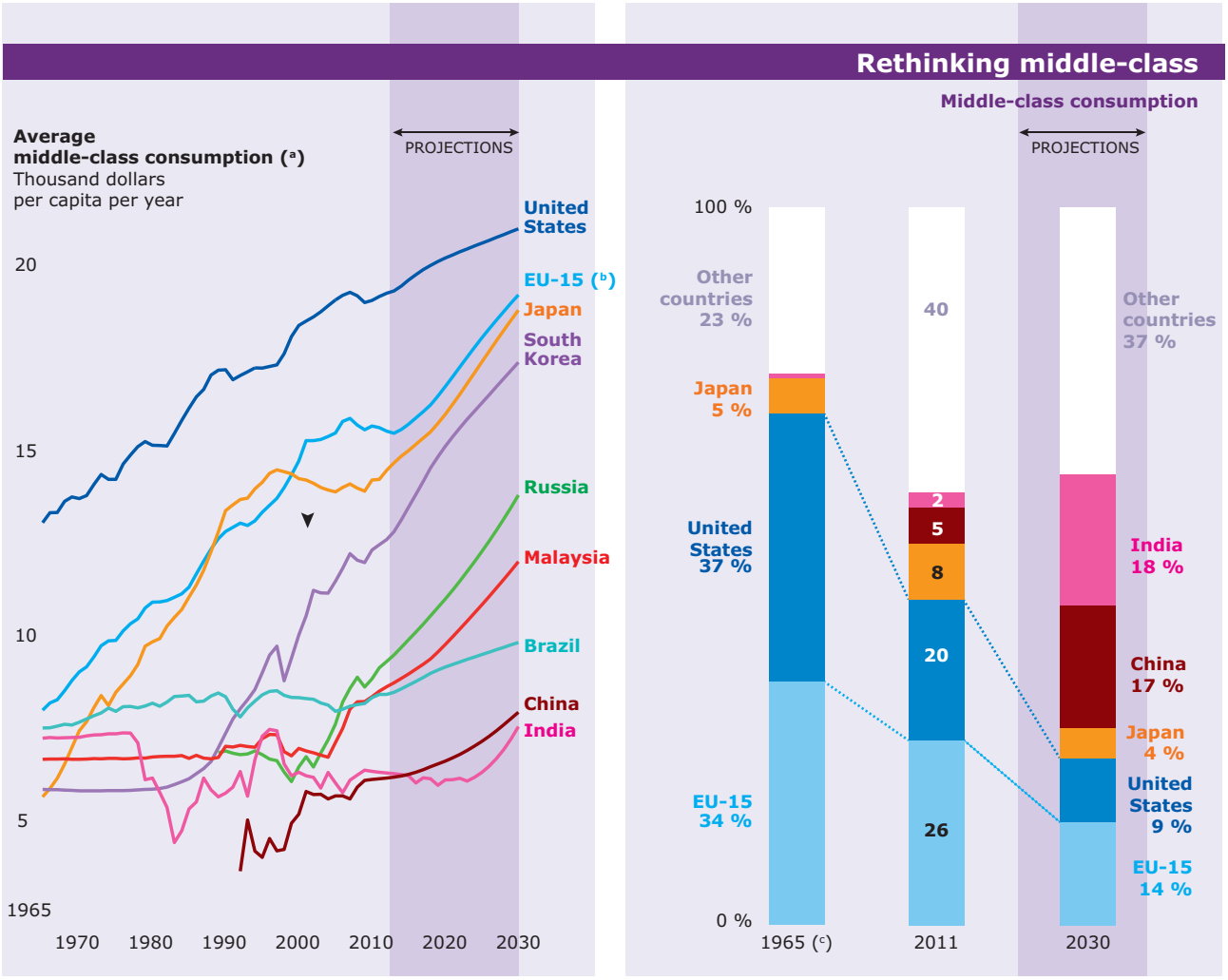
These trends have major implications for the living standards of large portions of the global population, potentially alleviating the insecurity associated with poverty and providing access to an increasing range of goods and services. Middle class citizens have the resources to invest in human and physical capital, and tend to participate more actively in political processes, with implications for economic and social development (Kharas, 2010).

As Figure 2.9 illustrates, highly urbanised countries tend to score well in on UNDP's human development index (a composite indicator conveying life expectancy, education standards and income levels). Yet the figure also highlights the heavy environmental burden associated with high levels of urbanisation. The per capita ecological footprint of richer, more urbanised countries tends to greatly exceed global average biocapacity, indicating an unsustainable level of resource use.

Against the broad narrative of rising living standards associated with urbanisation, the rapid growth of slums described above represents a serious concern. Slum inhabitants often endure squalid living conditions and high crime rates (UN-Habitat, 2013b). As detailed in GMT 3, urban poverty and a lack of access to basic services is also associated with increased risks of infectious disease. For example, it is estimated that 20 % of the urban population in the least developed countries lacked access to safe drinking water in 2008, and 51 % lacked adequate sanitation (UN, 2011b). Some diseases, such as dengue, have become permanently established in urban areas and cause regular epidemics. There are also several examples of urban growth triggering the decline of infectious diseases (i.e. in Marrakech urbanisation

([3]) Kharas defines the middle class as individuals with total daily household consumption expenditure of between USD 10 and USD 100 in 2005 PPP dollars.

Figure 2.8 The changing distribution of middle class consumption



Note: (a) Middle-class population is defined here as people living in households earning or spending between 10 and 100 dollars per person per day (2005 dollars, in purchasing power parity).

(b) EU-15 Member States are: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom. EU-15-only data have been chosen for consistency reasons.

(c) No Chinese data for 1965.

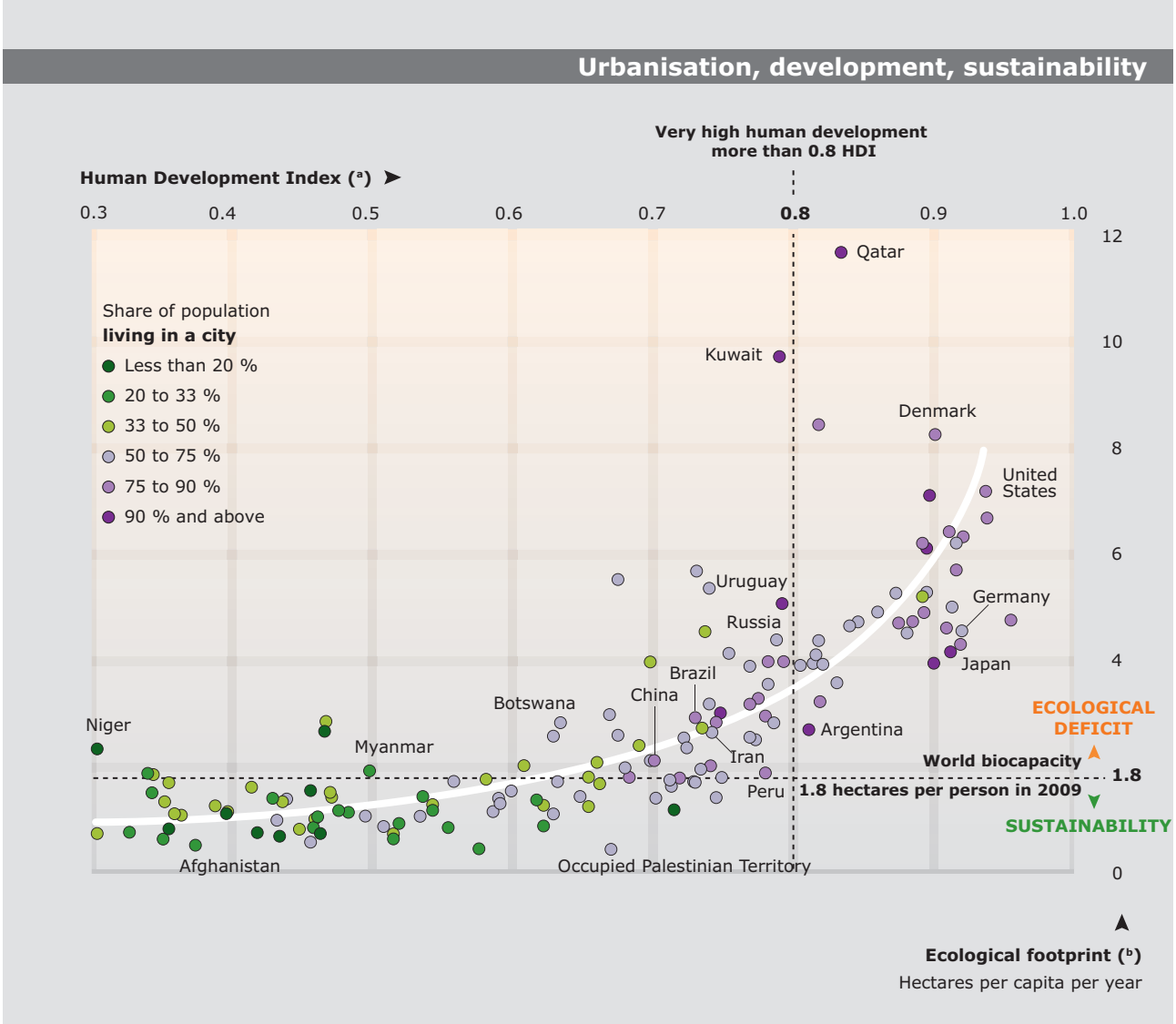
Source: Brookings Institution, 2013.

generally decreased sand-fly populations and levels of transmission of malaria in Sub Sahara are generally lower in urban areas than in rural areas). However, highly interconnected urban hubs are considered to be in general a catalyst to the spread of diseases. Increased mobility (tourism, big sport gathering etc.) has provided new opportunities for emerging diseases, particularly in cities, which constitute entry points for most travellers. Urban epidemics can reach unprecedented scales and quickly become uncontrollable. The 2009 influenza A H1N1 pandemic shows how fast infections can spread worldwide (see GMT 3 for details) (Alirol et al., 2011).

Greater environmental burdens or increased resource efficiency?

Economic development often implies increased resource use, waste and pollutant emissions, and environmental degradation, although there is some evidence of decoupling of economic growth from environmental pressures at higher income levels (see GMT 7). The huge growth in global economic output during recent decades has greatly increased competition for non-renewable resources and the burden on natural systems (GMTs 7 and 8), with wide-ranging environmental, social and economic implications.

Figure 2.9 Urbanisation, human development and ecological footprints by country



Note: (a) The Human Development Index is calculated using three components: education, life expectancy at birth and wealth. It is expressed as a value between 0 and 1, from less to most developed countries. Data for 2012.

(b) The Ecological footprint measures how much land and water area a population requires to produce the resources it consumes and to absorb its waste. The World biocapacity is the global productive area available on Earth (it decreases as population grows). Data for 2008.

Source: UN Development programme, 2013; UN population division, World Urbanization Prospects (2011 revision); Global Footprint Network, 2012.

As a key engine of innovation and economic activity, cities are central to these growing pressures. It is estimated, for example, that cities across the world account for 60–80 % of energy consumption and approximately half of anthropogenic CO_2 emissions (UNEP, 2011a; Satterthwaite, 2008).

On the other hand, compact urban settlements can provide a means to enhance living standards while alleviating the burden on the environment. Geographical concentration of businesses can make it cheaper to minimise environmental hazards and enforce environmental legislation. Proximity facilitates walking, cycling or public transport in place of private motor vehicles. And higher land prices and limited space incentivise owning smaller dwellings, often within shared structures, thereby

reducing energy and resource demands (Dodman, 2009; Glaeser).

As UNEP (2011a) notes, 'compact, relatively densely populated cities, with mixed use urban form, are more resource-efficiency than any other settlement pattern with similar levels of economic output'. Major cities tend to generate higher per capita economic output at far lower per capita greenhouse gas emissions than the country in which they are situated (UNEP, 2011a; Dodman, 2009). Developing region cities with very large manufacturing sectors, such as Shanghai and Beijing, are the notable exceptions to this general characteristic.

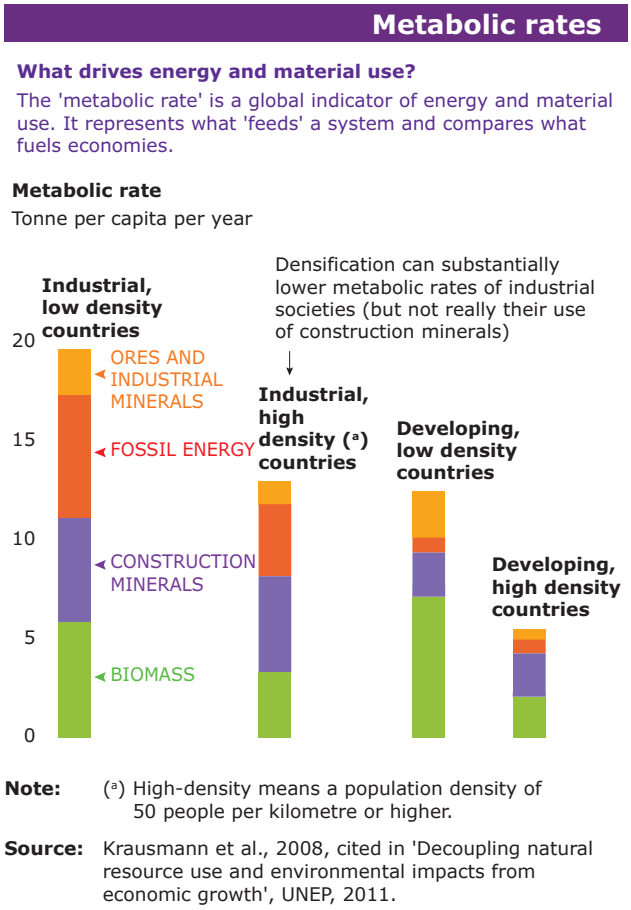
Cities also provide for greater efficiency with respect to consumption of other resources. Krausmann et al. (2008) find that per capita consumption of resources (in particular biomass, metals and industrial minerals) is markedly lower in densely populated areas than in relatively sparsely populated areas. This holds true in both industrialised countries and in non-industrialised regions (Figure 2.10).

The resource efficiency of cities depends greatly on urban planning, in particular with respect to the compactness of settlements. As illustrated in Figure 2.11, per capita transport-related energy consumption in cities varies greatly and is strongly correlated with urban density. There is also clear a regional clustering in terms of energy consumption and density.

Urban sprawl hinders cities from fulfilling their environmental and resource efficiency potential. Based on a study of 120 cities worldwide, Angel et al. (2010) have identified substantial global variance in urban density. In 2000, average density was estimated at 135 in cities in developing countries, compared to just 28 persons per hectare in cities in land-rich developed countries (e.g. the US, Canada and Australia). The average was 70 in cities in other developed countries.

The same study found some evidence that urban density tends to decline as urbanisation and economic development advance. Between 1990 and 2000, the average density of built-up areas in this sample declined by approximately 2 % annually. A sample of 20 US cities revealed a five-fold decline in density in the period 1910–2000. And a global sample of 30 cities recorded a threefold decline in density in the period 1800–2000. The authors conclude that current rates of density decline in developing regions imply that a doubling of urban populations in the next 30 years is likely to produce a tripling of the extent built-up areas.

Figure 2.10 Per capita resource use by development status and population density



Note: (a) High-density means a population density of 50 people per kilometre or higher.

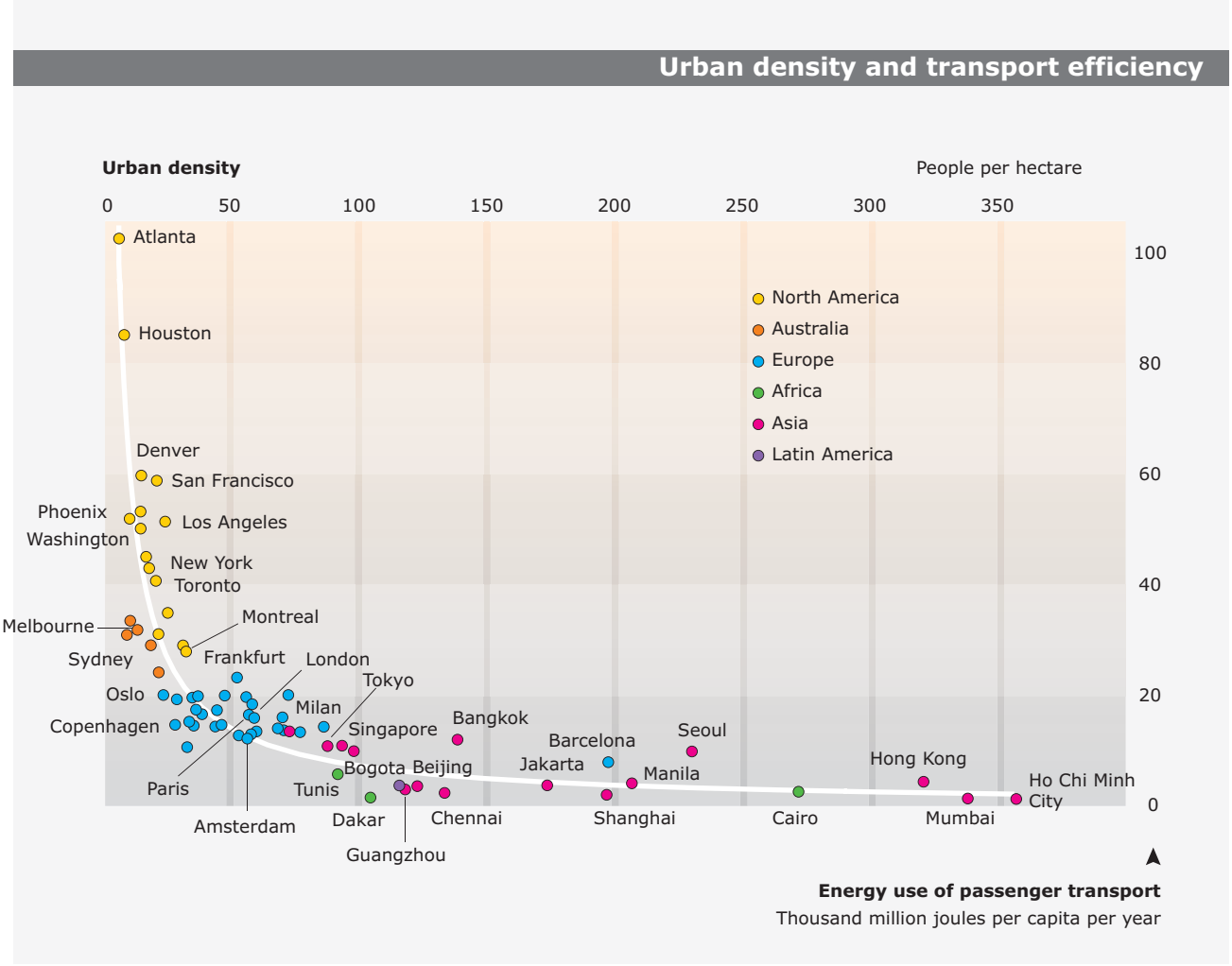
Source: Krausmann et al., 2008, cited in 'Decoupling natural resource use and environmental impacts from economic growth', UNEP, 2011.

Innovative urban governance

Urban governance emerges as a key issue for managing urban growth and for the implementation of policy actions and strategies in pursuing competitiveness objectives. Cities have to cope with negative effects of urbanisation and international division of labour (urban sprawl and spatial disparities, congestion and pollution, social issues and distressed areas) but they also have to produce proactive actions to improve and sustain their competitiveness position and foster agglomeration economies.

OECD published analyses (OECD, 2010) build on new paradigm of regional development policy. Globalisation confronts urban and rural regions with new opportunities and threats. The new paradigm's objective is to reduce persistent inefficiency(under utilisation of resources resulting in income below

Figure 2.11 Urban density and transport-related energy consumption



Note: Data for 1995.

Source: Jeffrey Kenworthy, Felix Laube, The Millennium Cities Database for Sustainable Transport, International Association for Public Transport (Brussels), Institute for Sustainability and Technology Policy (Perth), 2001.

potential) and persistent social exclusion (primarily, an excessive number of people below a given standard in terms of income and other features of well-being) in specific places.

The main obstacles fighting with those challenges include: the institutional fragmentation, the lack of critical mass in medium sized cities, the lack of capacity of local governments, lack of inter-municipal co-ordination within a single urban region both for strategy development and service delivery to optimising the development and impact of spatial strategies and intervention of all levels of government and involvement of civil society (see Box 2.2).

A review and analyses of metropolitan governance arrangements in OECD countries show that there is no one single model for metropolitan regions and that long term strategies are generally not well addressed in existing formal metropolitan governance arrangements. Different models of good governance alrady exist across the globe to cope with urban poverty and distressed neighbourhoods, climate change and environmental damage, mange competitiveness, land policy and strategic urban planning (OECD, 2010) (Box 2.2).

A successful urban development strategy should build upon each urban region's endogenous attributes, i.e. not only the mortar and bricks of infrastructure, but also the knowledge and skills of workers, and the social capital needed to trigger and sustain innovation.

Box 2.2 Involving civil society in metropolitan governance

The success of any metropolitan governance reform will largely depend on the *public support* that the new established structure is able to gain. The democratic character of metropolitan governance is not limited to the involvement of citizens through voting and representation or accountability of decision-making process but also includes *participation of non-governmental groups in the decision-making process.*

In Germany, the ***Stuttgart*** **Regional Association** works closely with a series of economic and social groups on various initiatives(sport associations, feminists groups, the private sector through mutual participation of their respective bodies). ***In Hungary***, the Act on Regional Development and Planning imposed the legal obligation to involve voluntary associations and businesses in the consultation process preceding the planning process. ***Seoul's*** executive leadership has sought to encourage more citizen input into metropolitan city management (they enabled for civil society and non-profit organisations to request audits of agencies, encourage their direct participation in controlling corruption and even offering financial inducements towards this aim; they made excellent use of Korea's very high rate of internet dissemination to craft an online system for handling civic affairs; they encouraged direct citizen representation in the decision-making process through various committees — 30 % of the committee members are required to be women with clear guidelines of work. In ***France***, the 1999 act on regional planning that established the establishment of mandatory councils which represent the economic and social actors at the metropolitan level to assist in the elaboration of their strategic projects and actions. However, they largely differ in membership and in place since the law does not provide for any rules in that matter (Lefevre, 2006; OECD, 2010).

References

Alirol, E., Getaz, L., Stoll, B., Chappuis, F., Loutan, L., 2011, 'Urbanisation and infectious diseases in a globalised world', *The Lancet Infectious Diseases*, Volume 11, Issue 2, pp. 131–141.

Angel, S., Parent, J., Civco, D.L. and Blei, A.M., 2010, 'The persistent decline in urban densities: Global and historical evidence of sprawl', *Lincoln Institute of Land Policy Working Paper* (http://www.alnap.org/pool/files/1834-1085-angel-final-1.pdf) accessed 22 January 2014.

Bio Inteligence service, Tanja Münchmeyer, Shailendra Mudgal, *Living in an urban world: Analysis for update and improved assessment of this megatrend,* 2013 (http://www.eea.europa.eu/publications/global-megatrend-update-1/increasing-divergence-in-global-population-trends).

Chavas, D.R., Izaurralde, R. C., Thomson, A.M. and Gao, X., 2009, 'Long-term climate change impacts on agricultural productivity in eastern China', *Agricultural and Forest Meteorology*, pp. 1 118–1 128.

Davis, M., 2007, *Planet of Slums*, Verso.

Dodman, D., 2009, 'Blaming cities for climate change? An analysis of urban greenhouse gas emissions inventories', *Environment and Urbanization* 21(1), pp. 185–201.

Gleick, P.H., 2008, 'Three Gorges Dam Project, Yangtze River, China', in: *The world's water 2008–2009: the biennial report on freshwater resources*, Island Press.

Glaeser Edward L., *The death and life of cities, 2009?*

Harvard University and NBER.

Hnatkovska, V. and Lahiri, A., 2013, *The rural-urban divide in India*, Working Paper, International Growth Centre, London.

Hunter, L.M., 2007, 'Climate change, rural vulnerabilities, and migration', *Population Reference Bureau* (http://www.colorado.edu/ibs/es/hunterl/research.html) accessed 14 January 2014.

IIED, 2012, McGranahan G. and Martine G., *Urbanization and development: Policy lessons from the BRICS experience*.

Kenworthy, J. and Laube, F., 2002, 'Millennium Cities Database for Sustainable Transport', (http://www.uitp.org/public-transport-sustainable-mobility) accessed 24 February 2014.

Khan, M.H., 2001, 'Rural poverty in developing countries: implications for public policy', *Economic Issues* 26.

Kharas, H., 2010, *The emerging middle-class in developing countries*, OECD Development Centre, Working Paper No 285, Organisation for Economic Co-operation and Development.

Kherallah, M., Delgado, C.L., Gabre-Madhin, E. Z., Minot, N. and Johnson, M., 2002, *Reforming agricultural markets in Africa*, International Food Policy Research Institute (IFPRI).

Krausmann, F., Fischer-Kowalski, M., Schandl, H. and Eisenmenger, N., 2008, 'The global socio-metabolic transition: past and present metabolic profiles and their future trajectories', *Journal of Industrial Ecology* 12(5-6), pp. 637–656.

Kuznets, S., 1960, *Six lectures on economic growth*, Free Press.

MIT, 2013, 'Why innovation thrives in cities — MIT News Office', (http://web.mit.edu/newsoffice/2013/why-innovation-thrives-in-cities-0604.html) accessed 9 January 2014.

De Nie, D., Sayer, J. and McCormick, N., 2009, *Indirect effects of bioenergy — Effects on landscapes and livelihoods*, IUCN.

OECD, 2010; Trends in Urbanisation and Urban Policies in OECD Countries: What Lessons for China?, Paris 2010.

Quigley, J.M., 2008, 'Urbanization, agglomeration, and economic development', in: Spence, M., Clarke Annez, P., and Buckley, R. M. (eds), *Urbanization and Growth*, Commission on Growth and Development.

Reusswig, F., Lotze-Campen, H. and Gerlinger, K., 2003, 'Changing global lifestyle and consumption patterns: the case of energy and food', in: *PERN Workshop on Population, Consumption and the Environment*,

Satterthwaite, D., 2008, 'Cities' contribution to global warming: notes on the allocation of greenhouse gas emissions', *Environment and Urbanization* 20(2), pp. 539–549.

Satterthwaite, D., McGranahan, G. and Tacoli, C., 2010, 'Urbanization and its implications for food and farming', *Philosophical Transactions of the Royal Society B: Biological Sciences* 365(1554), pp. 2 809–2 820.

De Soto, H., 2010, *The mystery of capital*, Random House.

Turok, I. and McGranahan, G., 2013, 'Urbanization and economic growth: the arguments and evidence for Africa and Asia', *Environment and Urbanization*, pp. 0956247813490908.

UN, 2011a, *Population distribution, urbanization, internal migration and development: an international perspective*, United Nations Department of Economic and Social Affairs.

UN, 2011b, 'Urban population, development and the environment 2011'.

UN, 2012, *World urbanization prospects — The 2011 revision*, ESA/P/WP/224, United Nations Department of Economic and Social Affairs.

UN-Habitat, 2007, *What are slums and why do they exist*, Twenty-first session of the Governing Council, 16–20 April 2007, Nairobi, Kenya, United Nations Human Settlements Programme.

UN-Habitat, 2013a, *Planning and design for sustainable urban mobility — Global report on human settlements 2013*, United Nations Human Settlements Programme, Nairobi, Kenya.

UN-Habitat, 2013b, *State of the world's cities 2012/2013*, United Nations Human Settlements Programme, Nairobi, Kenya.

UNEP, 2011a, *Cities — Investing in energy and resource efficiency*, United Nations Environment Programme, Nairobi, Kenya.

UNEP, 2011b, *Decoupling natural resource use and environmental impacts from economic growth*, United Nations Environment Programme, Nairobi, Kenya.

UNFPA, 2007, *State of world population 2007 — Unleasing the potential of urban growth*, United Nations Population Fund, New York.

WBGU, 2011, *World in transition: a social contract for sustainability*, German Advisory Council on Global Change, Berlin, Germany.

World Bank, 2009, *World development report 2009 — Reshaping economic geography*, World Bank, Washington.