Cities and urban areas will house nearly all of the world’s net population growth over the next two decades with 1.4 million people added to urban areas each week (UN 2014), equal to roughly the population of Stockholm. Cities are engines of national and global growth, accounting for 80 percent of global economic output. In China, four city clusters account for nearly half of China’s GDP (Shao et al. 2006). Cities are also key drivers of global energy demand and greenhouse gas emissions, accounting for around 70 percent of both (IEA 2008). Meanwhile, urban land area could triple globally from 2000 to 2030 (Seto et al. 2012). This is equivalent to adding an area larger than Manhattan every day. Accelerating urban development boosts private consumption (Dobbs et al. 2008) and requires significant infrastructure, including carbon intensive manufacturing and construction consuming massive quantities of concrete and steel consumption, particularly in the early phases of urbanization (Wang 2007).


1.2 Median age by country for 2015. A youth bulge is evident for Africa and to a lesser extent for South and Southeast Asia and Central America. Source: Jerker Lokrantz/Azote, modified after UN Factbook.

1.3 Facebook connections worldwide. Source: Jerker Lokrantz/Azote, modified after Facebook www.facebook.com/.

1.4 Regions of urban shrinkage in the world. Source: Kabisch et al. 2010.

2.1 Cities’ patterns from space NASA City Night Lights
   1) New York City, 2) Paris, 3) Cairo, and 4) Tokyo.

2.2 The scaling of gross domestic product as a function of city population. Source: Bettencourt 2013.

2.3 Examples of high-resolution tree species diversity (Street Tree Census, NYC), property values (Assessor data, NYC), and energy intensity (Energy consumption, NYC).

3.1 Urban population by community size for cities of five unique sizes. Note that smaller cities/communities of 500,000 inhabitants or less will continue to house the majority (approximately 50 percent) of the world’s urban population. Source: Jerker Lokrantz/Azote, modified after Chávez (2017).
3.2 Conceptual diagram of urban metabolism. A proportion of the resources that flow into cities become urban stock, while others enable and drive various anthropogenic functions and eventually produce intended or unintended outputs that stay within the system boundary or are exported beyond the boundary, with various impacts on the physical environment, flora and fauna, and associated ecological processes. Urban metabolism is shaped and regulated by factors such as urban policy, urban governance, culture, and individual behaviors. Source: Jerker Lokrantz/Azote, modified after Bai (2016).


4.1 A flooded house in Mexico City. Floods are major contributors to infrastructure and housing damage among poor populations in cities. Source: Patricia Romero-Lankao et al. 2014a.

4.2 Urban risk. This conceptual diagram shows urban risk not only as a result of hazard exposure and vulnerability, but also as shaped by five interacting development domains: sociodemographic, economic, technological, ecological, and governance. These domains operate within a wider context of interactions between environment and society. Source: Romero-Lankao and Gnatz 2016 modified after Field et al. 2012. Design Jerker Lokrantz/Azote.

4.3 Capacity and actual responses vary across scale, that is, across a household, neighborhood, and city region. Source: Romero-Lankao et al. 2014a.

5.1 Broad determinants of health. Urban health experts now know that the built, physical, social, and economic environments are crucial factors in maintaining and improve health. Source: Jerker Lokrabtzw/ Azote.

5.2 Urban health and well-being emerges as an outcome of urban system structure and processes and change factors from outside the system. Source: Jerker Lokrantz/Azote.

5.3 Simplified interconnections between urban transportation, air quality, climate change, and public health. Source: Jerker Lokrantz/ Azote, modified after Lung (2014).

5.4 Dynamic relationships between variables for food security and the proportion of obese people in urban communities. Source: Jerker Lokrantz/Azote, modified after Proust and Newell (2016).

6.2 The relationship between income per capita (current USD) and Gini coefficient in Latin American countries. Source: Jerker Lokrantz/Azote, modified after UN Habitat (2014).

6.3 Cumulative change in productivity (orange) and hourly compensation (green) in the United States between 1945 and 2015. Source: Jerker Lokrantz/Azote, modified after EPI (Bivens and Michel 2015).

6.4 Changes in the Gini coefficient, as well as the differential between the salaries earned by the richest and the poorest 10 percent (a metric called D10/D1) in Bogotá between 1991 and 2010. Source: Jerker Lokrantz/Azote, modified after UN-Habitat (2014).

6.5 The relationship between GDP per capita and the shadow economy as a percentage of total GDP on a global average. Source: Jerker Lokrantz/Azote, modified after Slonimczyk (2014).

8.1 The evolution of urban indicators.


12.1 Odo-Osun Spring in Ibadan North-East local government. Source: CNES/Airbus DS, DigitalGlobe/Esri, @OpenStreetMap.

12.2 Odo-Osun spring in 2010. Source: Grace Oloukoi.

12.3 Mahewa ward, Gorakhpur, India. Source: map provided by GEAG.

12.4 Dhaincha (center). Source: photo by GEAG.

16.1 Macroscale systemic change typically emerges from a long period of preparation that entails experimentation, innovation, and the formation of new coalitions at the micro-level. Proto-regimes that emerge from this preparatory phase typically only become institutionalized at a meso-level once a window of opportunity emerges in the form of a crisis or anticipated crisis. Our understanding of how these meso-level regimes can then effect larger-scale systemic change is still limited. The symbols indicate new configurations, where the social and ecological components of the system are connected in new ways. Source: Authors’ own.

16.2 Attributes of 120 urban relevant seeds from the Seeds of the Good Anthropocene database. These seeds are classified across five categories based on a) what type of action a seed is encouraging (stopping, reforming, or innovating activities); b) the status of the
seed (prototype, implemented, or a well-established project); c) which “anthrome” or social-ecological system the seed is oriented towards; d) what types of challenge of the Anthropocene the seed addresses; and e) the type of social-ecological integration the seed represents. The sum is greater than 100 percent because some categories are not mutually exclusive.

16.3 Urban seeds clustered into groups based on hierarchical clustering of the Anthropocene challenge(s) they address and their social-ecological type.

26.2 Walls isolate the street. Photograph by Anna Dietzsch.
26.3 When walls come down, space can flow. Credit: Anna Dietzsch.
26.4 Open private spaces are joined and opened up for common use. Credit: Anna Dietzsch.
26.5 A timeline of expanding São Paulo, but in 2100 nature starts to come back in through green corridors and open spaces. Credit: Anna Dietzsch.

33.1 Mural created by ROA for the 2013 Nuart Festival in Stavanger, Norway. Photograph taken in 2014.
33.2 A tag by Vrom Seier mimics the adjacent wrought-iron fence in Oslo, Norway. Photograph taken in 2014.
33.3 Various tags in Stavanger, Norway. Photograph taken in 2014.
36.2 Comparison of city population and budget per capita in cities in Global South and North. Source: Beard et al. 2016.
36.4 Equity as an entry point to a more sustainable city – a theory of change. Source: Beard et al. 2016.
47.1 The city doesn’t exist without an observer, by Diana Wiesner
47.2 Section of a drawing by Colectivo Bogotá Pinta Cerros, 2017. Citizens who participated printed their feelings for the mountains of the region with a 12-hand watercolor in 16 plates of 11.2 meters, representing the 57 kilometers of mountains near the city.
47.3 Soul Resilience, by María Ceciia Galindo.
47.4 A Child Holding a Painting by Walter J. Gonzalez called “My Future Bogotá”: from the south of the city he draws his image of the future.
47.5 Symphony of Democracy, by Diana Wiesner in collaboration with Daniela González. 449

S.1 No. of publications with “urban” as keyword 1950–2015 (Web of Science). 463

S.2 Current trends. 464

S.3 Urban system structure and interlinkages. The symbols represent various actors/constituents, structure, and processes across physical/built, social/economics, and ecological subsystems. The arrows represent complex processes and linkages within and between cities, and between cities and their hinterlands. The actors and constituents are typically self-organizing, and the structure, processes, and linkages and functions are dynamic and evolving, with nonlinear pathways. Source: Bai et al. 2016a. 474

S.4 Conceptualization of the interlinkages between factors and dynamic processes shaping urban futures. Visions are represented as societal goals influenced by worldviews, value systems, politics and power, culture and choices, and play an important role in intervention, innovations, and transformation that can lead to alternative and more desirable urban futures. Source: McPhearson et al. 2017, modified from Bai 2016b. 478