1. Megacities, megacity-regions, and the endgame of urbanization

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This Handbook is a contribution to current thinking and debates in urban and planning research on megacities and megacity-regions. The rise of mega-urbanization during the global urban transition raises vital questions for urban research: What place do megacities and megacity-regions occupy in a world of cities? How do they interrogate current thinking about urban theory, urban society, and urban policy? What environmental, governance, and social sustainability challenges do they pose? And what role will these largest urban places play in shaping humanity's future?

One of the most influential interventions in urban studies in recent years has been Brenner and Schmid's concept of "planetary urbanism" (Brenner, 2014; Brenner and Schmid, 2015). This approach argues that processes of capitalist urbanization now engage the whole planet, that there is no longer any meaning to former conceptions of a binary division between "urban and rural," and that we must conceive of cities "without an outside." They argue against conceptions that focus on cities as bounded entities measured primarily by population share, and for more open, multiscalar, processual accounts that focus on global processes of economic change and sociospatial conflicts. We agree with much of the thrust of this argument. At the most basic level, it is clear to all that urban economies, supply chains, capital flows, social, and environmental impacts are now global and leave no corner of the planet untouched. And it is also clear that urban studies can no longer focus simply on bounded "cities" within particular national territories but should take a multiscalar approach that discards a modernist ontology of linear, universal development and sees urbanization instead as a global phenomenon characterized by contingent, uneven, and disparate processes of spatial transformation that are continuing to produce highly variegated outputs in different places.

Yet, discarding city population and dense urbanization as central urban variables comes at considerable costs, the most serious of which we see as the loss of attention to differentiation among settlement scales and types. For example, Brenner (2014) explicitly discards population size typologies as a part of the obsolete and to-be-discarded baggage of "methodological cityism" that planetary urbanism is meant to supersede. With this Handbook we seek to counter this unfortunate flattening of the understanding of the urban produced by the planetary urbanization approach. If all is urban and there is no longer an outside, and all settlements are caught up in the same urbanization processes and global economic transformations are to be explained through "one overarching theory" (Schmid, 2014, p. 68), it is harder to ask questions about differences – real or perceived – between distinct urbanization processes and urban issues at different scales. We argue that notwithstanding the significant insights of the planetary urbanization framework, this is an important and unnecessary loss that is worth countering vigorously.

There are good reasons to think that small, medium, and large urban regions face substantively different challenges. The suggestion here is not that all cities within a particular

size category are the same, or necessarily even similar; they are not. But, as shown by many of the chapters in this Handbook, very large urban regions face distinctive governance and environmental challenges, present significant questions for research, and occupy a major place in urban imaginaries and understandings. This is despite the fact that megacities and their inhabitants represent only a small share of all cities and urban population worldwide. According to the most recent United Nations world urbanization prospects data, world urban population was 4.2 billion in 2018, with about 463 million living in 29 urban agglomerations larger than 10 million (12 per cent of world urban population), 310 million in 45 agglomerations between 5 and 10 million (8 per cent), 865 million in 439 agglomerations between 1 and 5 million (22 per cent), and 650 million in 1261 agglomerations of between 300 000 and 1 million (17 per cent) (UNDESA, 2018). The UN further projects that by 2035 there will be 862 million living in 48 agglomerations larger than 10 million, accounting for 16 per cent of world urban population, making this the fastest-growing size category as more agglomerations exceed the threshold of 10 million. It is clear, therefore, that megacities represent just one part of urban processes today. We argue, however, that they are an important part, with distinctive characteristics and challenges.

It is important to be clear about definitions. The definition of “megacity” has ranged from > 4 million population (Dogan and Kasarda, 1988), to > 5 million (Kraas et al., 2009), and > 8 million (Gilbert, 1996; Richardson, 1993), but seems to have stabilized at > 10 million.¹ There is no reason to believe that the number 10 million has any intrinsic meaning as a threshold, or that there is any qualitative difference between an urban agglomeration of 9 million population and one of 11 million. But it does make sense to think that there are qualitative differences between urban agglomerations of 1 million and those of more than 10 million population. It is also important to stress that definitions of “urban” vary even within the UN data,² and it is impossible to draw a tidy line demarking inside and outside of any given megacity, as most urban areas dribble out at their edges into extensive peri-urban areas with lower and lower densities and increasingly scattered development.³ Where to draw the line?

The question of boundaries and boundedness complicates even the most elementary discussion of urbanism but is particularly challenging for the fast-changing and sometimes amorphous category of megacities. Where is the boundary, and what is included, what excluded? While it is easy to discard the political boundaries of central cities as historical artifacts that serve only to hinder understandings of actual patterns of urbanization, it is not so easy to find a convincing substitute. For instance, scholars and international organizations have argued for a harmonized definition of urban regions as a means to work around the limits of political definitions (e.g., Hall, 2007; OECD, 2012). A predominant answer is the notion of the “functional urban region,” broadly defined as one or more dense urban cores and their economically integrated hinterlands, generally denoted by common labour and housing markets or a common commuter shed (see Rae and Nelson, Chapter 13, and Stewart, Kennedy and Facchini, Chapter 19 in this book).

While a functional definition of urban regions can better support international comparisons of urban growth, economic activities, and so forth⁴ than political understandings of the city, it hardly solves the bounding issues posed by very large urban formations. Megacities, in particular, seldom have tidy edges, as urban economies almost always activate extensive adjacent areas (widely referred to as “peri-urban areas”) that serve as the location for a wide range of space-intensive uses such as reservoirs, airports, garbage dumps, logistics centres, and so on (Friedmann, 2011; McGee, 1991; Webster, 2011) (see Webster and Li, Chapter

12 in this book). Peri-urban areas seeing only scattered land development can be profoundly transformed by rising land prices and perceived development potential long before any visible changes are manifest. Moreover, in rapidly urbanizing regions such as Asia and Africa, megacities' labour markets include vast pools of workers whose rural–urban migration patterns can defy conventional notions of commuter shed (e.g., Björkman and Venkataramani, 2019). Determining the “edge” of the megacity is not possible.

Such challenges are even more acute in the case of polycentric megacity-regions that have grown into conurbations, by which we mean “cities, large towns, and other urbanized and/or nominally rural areas which, through population growth and physical expansion, have merged to form a continuous urban and economically developed area that functions in at least some respects as integrated urban entities” (Friedmann and Sorensen, 2019, p. 1).⁵ Such polycentric regions tend to incorporate even larger labour pools and peri-urban areas into their orbit (see Chapter 12 by Webster and Li, Chapter 13 by Rae and Nelson, and Chapter 24 by Cardoso and Meijers in this book). The largest megacity-region, at this point in time, might be the Yangtze River Delta area around Shanghai with a population estimated at over 140 million (see Yeh et al., Chapter 25 in this book). But there are others, such as the Pearl River Delta encompassing Guangzhou, Shenzhen, Hong Kong, and Macau (ibid.), the northeast seaboard of the US from Boston to Washington, and the European core area, including most of the Netherlands, Northwestern Germany, Belgium, and Northeastern France, among others.

As it is impossible to draw a precise and meaningful boundary for such areas, and as without a clearly defined boundary we cannot have accurate population counts, here we simply define megacities and megacity-regions as urban areas and polycentric functional urban regions that contain aggregate urban populations of over approximately 10 million. Methods for defining what to include in megacity-regions continue to evolve, and we do not try to settle this question here (but see Chapter 3 by Leaf, Chapter 13 by Rae and Nelson, and Chapter 24 by Cardoso and Meijers in this book for discussions). Whatever the method, there is little doubt that the transcendence of the administrative city by the urban in megacities and megacity-regions will continue to call for a separation of the scale of analysis from those of individual political jurisdictions (Schafran, 2015, p. 91).

Whereas a generation ago it was common to see growth in urban scale as open-ended, it is now projected that urbanization will slow over the next 50 years as world population approaches 80 per cent urban and global population growth slows. Current processes of mega-urban growth should therefore be seen as part of the culminating process of global urbanization; what we could call the “endgame” of urbanization. As argued in a recent paper, the fact that the great majority of the world's population will be urban, and total global population is projected to peak by the end of the twenty-first century, suggests that “the particular timing, governance institutions, and contingent choices of planning and infrastructure building will in each case have profound long-term consequences, because many durable patterns are created during urbanization, and processes of change are likely to slow as rates of growth decrease” (Sorensen, 2019, p. 35).

From the perspective of the development of human civilization, therefore, the urban transition from predominantly rural to overwhelmingly urban populations, economies, and lifeways is taking place in a relatively short period. It took approximately 5000 years of urbanization to reach 16.4 per cent of global population living in cities by 1900 (Goldewijk, Beusen and Janssen, 2010, p. 568), and just another century to reach 50 per cent urban by 2007 (UNDESA, 2018). Current projections are for the urbanization rate to increase to 66 per cent by 2050, and

the urbanization process is likely to be completed by the end of the current century, at between 80 and 90 per cent of total population, and about 9 billion urban residents (see Leaf, Chapter 3, Sorensen, Chapter 4, and Hoornweg and Pope, Chapter 15 in this book). Significantly, as most contemporary urban development is at relatively lower densities than before, the growth of total urban area is significantly faster than the growth of population (Angel, 2012; Hack, 2000), suggesting a vast production of new urban space over the next several decades.

Given slowing rates of population growth in most of the world, and projections of both peak global population and an over 80 per cent urbanization rate globally by the end of this century, it is clear that we are now entering the culminating phase of the global urban transition, after which urban population growth will slow and then begin to decline. It seems certain, therefore, that the twenty-first century will represent an inflection point in human history, with the end of processes of population growth and of the urban transition, and the beginning of a new era of global population decline. The distribution of remaining urban growth will be highly uneven, with major urban growth still expected in Asia and Africa, whereas urbanization rates are already high and birth rates are already below replacement levels in Japan, South Korea, Taiwan, and most countries in Europe and the Americas. In other words, the patterns of mega-urbanism created over the next century will certainly have significant long-term impacts.

1.1 MEGA-URBANIZATION AS AN IDEA

While megacities and megacity-regions represent only about 12 per cent of global urban population now, they nevertheless loom large in collective imaginaries. Discourse and representations of giant cities swing between fear and fascination and between catastrophist and celebratory approaches, and these conceptions are powerful tools in political and economic struggles over governance, investment, and liveability. Ideas are continually contested because they shape understandings and preferences, help us to interpret our experiences, and serve to explain, mobilize, and shape action. As Leaf (Chapter 3) argues, the notion that urban gigantism and overlarge cities are “a pathology of excessive urban growth” (p. 35) has a very long history, having almost emerged along with the first cities. Part I of this Handbook, “The Conceptual Challenges of Megacities,” includes four chapters that each in very different ways use explorations of the significance of mega-urbanization processes to interrogate current thinking about urban theory, urban society, and urban policy.

As a planning theorist, Friedmann (Chapter 2)⁶ is concerned primarily with the ways in which the new scale, pace, and complexity of urbanization force us to think differently about spatial planning. He argues that the increasing scale of urbanization – particularly in East Asia where functionally interdependent megacity-regions such as those centred on Shanghai and Guangzhou are now well over 100 million in population – poses fundamental challenges to the planning project to help create more sustainable, liveable, and equitable cities that support human flourishing. He suggests that the effectiveness of planning may be profoundly compromised by what he describes as “the hyper-complexity of mega-conurbations resulting from scale, density, speed of development and the multiplicity of centers of governance and power” (Chapter 2, p. 21). He makes a convincing case that although “reliable knowledge of the conditions, patterns, and trends relating to the dynamics of urban expansion is necessary for a solid foundation of spatial planning” (p. 27) in such enormous megacity-regions planners are

effectively operating in the dark, without timely or accurate data about current conditions. The challenge is thus to find ways to prevent growing negative externalities of “air, land and water pollution, resource depletion, growing social inequalities, and the destruction of place-based social webs” (p. 27) from reaching tipping points that precipitate serious crises.

Friedmann argues that one response to the governance challenges posed by the increasing scale of megacity-regions would be to develop governance capacity at three scales: that of the region as a whole; that of municipal administrative units; and that of neighbourhoods. At the regional scale, the focus should be on developing broadly shared longer-term visions and regional capacities to collect data on patterns of urban change, on urban forms, flows, and function. At the neighbourhood scale, focus would be on developing better and more autonomous governance and planning approaches to allow urban residents more input into shaping and improving their immediate living environments and local services. Friedmann’s is thus a normative project, to understand and respond meaningfully to the serious challenges posed by a scale and speed of urbanization that is qualitatively different from that of the twentieth century.

Leaf’s project in Chapter 3 deploys the idea of megacities and mega-urbanization to interrogate discursive constructions of the city that attempt to differentiate urban and rural, city and urban, developed and developing, North and South. Leaf argues that how the *idea of the city* “is represented by academics, political leaders, journalists or others among the public at large – may be as consequential as its physical or socio-economic composition in determining its future trajectory” (Chapter 3, p. 41). He starts by questioning the possibility of defining any meaningful geographic boundary to the city, as cities exist at once on economic, social, administrative, mental, and other dimensions that each have not only different but also porous boundaries. As a solution, he proposes two distinct conceptualizations of human settlement: the city and the urban. The jurisdictionally bounded “city,” understood as the delineated and state-governed entity, and “the urban” (or city unbound), which refers to less clearly territorially delimited sociocultural differences, ecosystem flows, interjurisdictional regulatory conditions, networked flows and connections. These conceptual distinctions support Leaf’s suggestion to move past rural–urban dichotomies and instead work with the notion of a continuum of settlement practices and forms in which the flows and networks between different parts are key.⁷ Discarding the pejorative implications of mega-urbanization can similarly help to overcome binary notions of distinctive urbanisms of North and South, rich and poor. Ultimately, for Leaf, megacities pose basic questions about the nature of human settlements, that is “the means by which our species inhabits the planet” (Chapter 3, p. 43).

Sorensen (Chapter 4) develops a long-term and macro-comparative perspective, suggesting that it is essential to understand the current period of rapid large-scale urbanization not just as a process that creates new urban populations and urban forms, but also as one that accelerates fundamental processes of institutional genesis and of the institutionalization of place that create significant and lasting differentiation between jurisdictions. Urban transitions necessitate the development of complex sets of urban institutions to regulate urban space, and because of differences in antecedent conditions and in the timing, sequencing, and pacing of urban transitions, these processes of institutional genesis and city building tend to produce significant differentiation between jurisdictions both in terms of key urban institutions, and of basic patterns of urban form. In these processes *urban property systems* are created that are a combination of sets of urban institutions, sets of public and private infrastructure, and sets of property. As discussed above, the current global urban transition from 50 per cent urban

to fully urban, and then to population decline, is projected to be completed during the current century, with many countries reaching that tipping point much sooner. In most jurisdictions, soon after peak urbanization, population will start to decline, removing the growth engine that was propelling urban institutional dynamism in the first place.

Sorensen illustrates this macro-perspective on the endgame of urbanization through the case of Japan, the first major economy to have passed the tipping point to population decline and urban population shrinkage. He shows how a few momentous decisions early in this country's urbanization process have shaped outcomes until the present, and how the timing, sequencing, and pacing of institutionalization and demographic and urban transition processes are key variables that produced lasting differentiation between places. This contribution emphasizes the defining role of contemporary urbanization processes in longer-term outcomes, whether in terms of urban form, urban governance, or social equity. Echoing a point made by several other authors in this volume, this chapter demonstrates the value of a longer historical perspective to understand the transformations currently taking place in megacities and megacity-regions.

Boudreau and de Alba (Chapter 5) examine Mexico City through the metaphor of the city as monster, "*el Monstruo*," an ungovernable place of death, immorality, filth, and chaos. They analyze the urban monster metaphor as a linguistic process by which the city is anthropomorphized and given a human image, but one associated with pollution, social inequality, ungovernability, sickness, and uninhabitability. Mexico City is presented as a monstrous centre of political power whose relentless growth has been "destroying agriculture, water systems, and cultural traditions" (Chapter 5, p. 71). Constant and accelerating unplanned urbanization produced extreme social inequalities and severe deficiencies in infrastructure and services and an informalization of service provision that makes urban residents' life unbearable. The monster that is Mexico City is thus ungovernable and uninhabitable, and monstrous growth produced a city on the verge of breakdown because of unrelenting pollution, crime, violence, and corruption.

Boudreau and de Alba argue that, "Speaking of Mexico City as a monster is a mode of political imagination. Indeed, the metaphor is ideologically charged with negative connotations and traversed by political tensions between the city and the countryside, the city of the Global South and that of the Global North, the rich and the poor" (Chapter 5, p. 66). Their contribution draws much needed attention to the consequences that these thick and enduring narratives framing Mexico City (and other giant cities) as monstrous and ungovernable, with constantly repeated attributes of death, immorality, filth, and chaos, have in shaping not only government policies, but also residents' shared imaginaries and everyday life.

1.2 GOVERNANCE CHALLENGES OF MEGACITIES AND MEGACITY-REGIONS

Megacities and megacity-regions pose enormous challenges for governance due to their great size, high levels of jurisdictional fragmentation, complex multilevel administrative structures, conditions of rapid growth, and huge demands for investment in infrastructure. In Part II of this Handbook, "Mega-urban Governance," as Lefèvre (Chapter 6) notes, a primary question is "the capacity of a governance system to produce collective action" (p. 78) but such collective action is difficult in megacities for many reasons. First, for most megacities and megacity-regions, the scale and speed of urbanization has been such that existing jurisdictional

boundaries have been surpassed, and the functional urban region includes dozens or hundreds of local governments. If some regional governments have been created, no megacities today have a single government that is responsible for governance throughout the functional urban region. In all cases, the scale of growth and the resulting fragmentation of responsibility work against efforts to generate collective action. Schafran (2015, p. 86) even suggests that “mega-regions should be defined in part by the fact that their urban networks exceed any attempts to unify them politically and likely always will.”

A further issue raised by Lefèvre is the proliferation of new governance actors and scales of action. In addition to local, regional, and national governments, there is increasing engagement of supranational governments like the European Union, international organizations like the World Bank or the OECD, global firms in finance, utilities, and services, and also international NGOs and social movements, as well as digital platforms such as Airbnb and Uber that have their own priorities and influence. Supporting this claim, Zerah (Chapter 9) shows that institutional complexity is the defining feature of Mumbai governance. Multiscalar forms of competition between the actors involved tend to exacerbate the tensions and ambiguities of governance processes, opening spaces for informal and flexible arrangements that enable both corporate land development projects, and a wide range of smaller-scale bottom-up projects that define the contested political economy of the Mumbai region. Kennedy (Chapter 8) tells a similar story for other Indian cities, with an emphasis on how multiscalar governance undermines the potential for democratic local governance. And in the context of Manila, Kwak (Chapter 7) shows the enormous influence of the World Bank and US-based development agencies whose priority was slum clearance and the removal of poor residents, limiting the potential for meaningful land reform. As she puts it (p. 98): “Discussions of scale in the governance of megacities, then, must necessarily consider not only individuals, communities, and land directly involved, but also those influences physically remote from the city, equally invested, and at times, more powerful than any resident-citizen. Transnational actors like church representatives, human rights advocates, housing experts, and development aid agencies played as much a role as evacuees, politicians, and city officials in deciding how communities would be governed.”

This fragmentation of governance responsibilities has been exacerbated in many places by processes of decentralization, as in both France and India (see Chapters 6, 8, and 9), where significant responsibilities and resources were moved from central government to local governments in the 1980s and 1990s. Formerly dominant central governments thus have less capacity to coerce recalcitrant local governments, or to impose plans and projects on them. Yet Kennedy (Chapter 8) suggests that the impact in each place varies greatly because of the different ways decentralization has been implemented. Growing institutional complexity, with competing logics and actors with parallel and overlapping responsibilities and powers means that megacities are important cases of multilevel governance, with all the complexities and contradictions it brings. As Zerah (Chapter 9) shows so clearly in the case of Mumbai, multilevel governance in contested political landscapes fosters intense competition for decision power and the resources that flow from it, and the growing number of players in governance processes greatly increases complexity, as these new actors also bring different priorities, capacities, and resources.

Yet, central governments maintain powerful roles in governing megacities, in part because they represent such important shares of national economies, and many are often also national capitals, with a disproportionate influence in processes of political and economic change.

Megacity-regions are almost always their country's most important economic, political, and cultural centres, and, as has long been argued, represent the key basing points articulating regional and national economies to global networks (Friedmann, 1986; Sassen, 1991). As Shatkin argues in Chapter 23, megacity-regions play an increasingly "central role in national economies and in technical innovation, and are consequently seen by state actors as strategic sites for the achievement of economic growth objectives" (p. 346). Central governments have major advantages in pursuing developmental strategies because they can change fundamental rules of the game, and have exceptional powers of land acquisition and compulsory purchase. "Governments can also play important roles in reducing risk to finance by taking on politically challenging project implementation tasks like land acquisition, through the use of state powers of compulsory acquisition, or through the establishment of administrative rules and regulatory apparatuses to ease the transfer of land to corporate actors" (Chapter 23, p. 350) (see also Harms, 2019; Labbé, 2019). Kwak similarly shows that the state "pursued private investors – investors who would not have had access to critical resources and land without strong states paving the way for global investments by eroding informal dwellers' claims to territory" and using expropriation powers to transfer land to private companies (Chapter 7, p. 92).

But such strategies are not only seen at the national government scale. Kennedy (Chapter 8, p. 102) argues that state actors at multiple scales use spatial technologies "to redefine territorial jurisdictions and create parallel governance mechanisms that bypass elected local bodies," strategies that effectively remove territory from local government jurisdiction. Such tweaking and bypassing of regulation can allow the capture of development value by major political/developer/builder growth coalitions, but Zerah argues that in Mumbai such growth coalitions are paralleled by similar strategies deployed by small-scale players that are well connected at a neighbourhood scale. Citing Roy (2009), she argues that the strategic deployment of informality is a fundamental mode of governance, claiming that "Mumbai's singularity lies in this constantly shifting meeting point between a rule-based governance regime and flexible arrangements" (Chapter 9, p. 130). Choplin and Hertzog (Chapter 14) make a similar point in their chapter on the West African urban corridor from Accra to Lagos, with the multiplication of agencies "created by executive orders" that are designed to manage local megaprojects through "spaces of exception" (p. 218).

Even so, this does not mean that governance processes are only regressive, top-down accumulation strategies. Sagaris et al. point to the importance of the neighbourhood scale as a place of action and local governance. As they put it: "neighbourhoods, the smallest building block, may remain key to achieving a decent quality of life for all" (Chapter 10, p. 138). They ask what can neighbourhood life and organization contribute to more liveable megacities and megacity-regions, and what kind of planning can support their efforts, and argue that "even in extremely difficult circumstances, neighbourhood organizations can defend sustainable and equitable forms of urban development" (p. 143). Friedmann (Chapter 2) similarly argues that to make more liveable megacity-regions, strengthening of governance capacities and responsibilities at the neighbourhood scale is essential.

1.3 MEGA-URBAN BOUNDARIES, UNBOUNDEDNESS, AND PLANNING CHALLENGES

Patterns of urban growth, resulting urban forms, and their consequences have been central to urban studies, as have normative questions about whether some patterns of urban growth are better – more efficient, sustainable, healthy, or affordable – than others. These concerns have perennially featured debates about very large cities, from Geddes's (1915) concern that the growth of cities would lead to their coalescence into an undifferentiated conurbation, and Mumford's (1940, 1961) fear that overgrowth of the largest metropolitan areas would suck the vitality from rural areas and lead to decay and congestion in the centre, to Davis's (2004) portrayal of emerging megalums sinking into cesspits of human waste.

The premise of much research has been that megacities and megacity-regions generate qualitatively different urban environments, and environmental problems, than smaller settlements. For example, research on urban form and megacities has focused on the challenges that giant, fast-growing urban areas pose for infrastructure such as water supply and drainage (Bakker, 2010; Bostoen, Kolsky and Hunt, 2007; Davis, 2004; and see Silver, Chapter 22 in this book); health (Kraas et al., 2009; Songsore and McGranahan, 2007); transportation, mobility, and congestion (Gakenheimer, 1995; Kenworthy and Townsend, 2007); and liveability and sustainability (Dogan and Kasarda, 1988; Kraas et al., 2009; Sorensen, Marcotullio and Grant, 2004; Sorensen and Okata, 2011a).

Since the 1960s, a major concern of research on mega-urbanization has been with issues related to urban sprawl, the energy intensity and fragmented governance of extensive patterns of development and peri-urbanization (Friedmann, 2016; Hack, 2000; Sorensen and Okata, 2011b; Webster, 2011). Today we are seeing the emergence of much larger urban areas than ever before seen in human history, in patterns of growth enabled by the ubiquitous use of cars and trucks and the spread of expressways, and knitted together by high-speed trains and fibre optic networks. Current megacity-regions experience not just the "sprawl" of low-density auto-oriented suburbs that has long been the concern of planners, but increasingly polycentric, networked patterns of development, and the integration of vast peripheral areas into urban economies. The continued growth of giant urban regions poses huge challenges for maintaining and strengthening liveability, equity, and economic functionality. The five chapters in Part III of this Handbook, "Mega-urban Patterns, Forms and Planning Approaches," each examine the question of boundaries and the unboundedness of contemporary patterns of urbanization, but from very different perspectives.

Han (Chapter 11) approaches the question of megacity boundaries from the perspective of the policies designed to create and enforce them. Beijing is a remarkable case in which a powerful government, possessing extraordinary policy levers of state ownership of land, land development control, industrial location, and even migration had very limited success in attempts to restrain processes of urban growth, protect greenbelts, and impose hard boundaries on the physical growth of the capital city. As Han details, population targets inscribed in plan after plan were superseded long before expected, and the first greenbelt, instead of defining the limits to growth, provided an opportunity to satisfy green infrastructure targets within the built-up area. Planning for the capital region has now decisively jumped scales with the Beijing-Tianjin-Hebei (Jing-Jin-Ji) Integration Plan projecting a polycentric megacity-region population of 110 million. Even the exceptional powers wielded by the Chinese state planning apparatus were unable to draw growth boundaries around Beijing that could stick.

A fundamental characteristic of megacities and megacity-regions today is their incorporation of vast peri-urban areas adjacent and between urban centres into urban orbits and influences. Webster and Li (Chapter 12) provide a fascinating tour of the enormous, rapidly growing peri-urban areas of Southeast and East Asia where, as they explain, most of the world's heavy industry driving economic growth was located during the last few decades. While the spread of high-speed rail enables much more extended patterns of economic development and enables leapfrogging of development over undeveloped land, it also promotes concentration in the city centres that have the best connectivity. They project a slowing of peri-urbanization with the end of demographic growth and rural to urban migration, and argue that the function of peri-urban areas in Asia are changing as heavy industry gives way to more tertiary uses that often occupy large areas (e.g., logistics centres, golf courses, second-home developments, etc.), and much larger areas of land dedicated to environmental services.

Over the last decade there have been many approaches to the question of how to delineate the boundaries of megacity-regions (Florida, Gulden and Mellander, 2008; Regional Plan Association, 2006; Ross and Woo, 2009). Rae and Nelson (Chapter 13) argue that commuting patterns are an important metric that is based neither on administrative boundaries nor on simple measures of density. While no single measure can definitively draw the line around entities as complex as megacity-regions, commuting patterns clearly do provide one important perspective by revealing patterns of significant functional spatial economic integration through daily travel patterns. Rae and Nelson's analysis suggests that functional megaregions in the US extend well beyond the limits of the densely built-up urban areas into peri-urban and rural areas, that US megaregions are porous, not self-contained, and that political boundaries correlate very poorly with functional patterns of megaregions. They also argue that megaregions revealed by network analysis correspond well with people's understanding of functionally integrated places.

Choplin and Hertzog (Chapter 14) develop a remarkable portrait of one of the fastest-growing megaregions in the world, the West African urban corridor along the coast of the Gulf of Guinea from Accra to Lagos. This emerging polycentric megaregion is in the form of a corridor, comprising a string of fast-growing metropolitan areas along the coastal highway. Here again a megacity-region is structured by transportation infrastructure; this time in the form of a highway that links together multiple major cities into a functional urban corridor, albeit with many blockages limiting connectivity, from poor roads, to national borders, to checkpoints and tolls to congestion. Choplin and Hertzog suggest that polycentricity allows huge opportunities for small-scale self-build projects by the poor, who build lasting structures in concrete and cement as their claim to the city and to permanent residence. At the same time, the emerging urban areas are plagued by social inequality and environmental vulnerability, reflecting the governance and infrastructure challenges of dispersed unplanned urbanization. And although all the major cities in this megacity-region have their own plans for the period 2020–30, none even acknowledge the other cities in this increasingly integrated region. The dynamic West African urban corridor is increasingly economically integrated across borders, but national boundaries continue to powerfully structure and separate governance and planning approaches.

Discussions about megacities and megacity-regions have long been informed by the valuable demographic projections prepared by the United Nations (see UNDESA, 2018), which project global and regional urban population to 2050. Hoornweg and Pope (Chapter 15) extend these projections to 2100 with the aid of the Shared Socioeconomic Pathways (SSP) growth

scenarios developed by the US National Center for Atmospheric Research (NCAR). The SSP scenarios project population growth, urbanization rates, energy use, and so on for a range of different possible combinations of birth rates, mortality rates, and economic development pathways, producing estimates of the magnitude of urban growth. It is always wise to be cautious about projections so far into the future, but these are not meant to be predictions as much as “what if” scenarios given different possible pathways of development. This is a valuable contribution to understanding the challenges posed by rapid population growth and urbanization in coming decades, as it gives us a sense of the likely scale of the maximum urban footprint in different places. For example, in all the scenarios, Africa stands out as the continent that will see the greatest growth of urban population, and as Choplin and Hertzog (Chapter 14) show, African megacity-regions are likely to see major challenges managing such rapid growth. The SSP2 “middle-of-the-road projection” for West Africa is that urban population will grow from 133 million in 2010 to over 500 million before the end of the century. This raises important questions about how to plan for or against such futures.

1.4 HUMAN-SCALE EXPERIENCES OF THE MEGA-URBAN

As Hoornweg and Pope (Chapter 15) show, nearly half a billion people currently live in megacities, with many more living in megacity-regions. What is it like for these millions of people to inhabit the planet’s largest urban agglomerations? What impacts do mega-urbanism and mega-urbanization processes have on liveability and everyday life spaces? How do they shape the lived experience of individuals, households, and local communities embedded in the multitude of sociospatial substructures that make up the fabric of vast urban places?

A first set of answers to these questions is provided by quantitative studies concerned with the costs and benefits of the agglomeration of vast numbers of urbanites in space (e.g., Baum-Snow and Pavan, 2013; Bettencourt et al., 2010). This is a relatively small scholarship and one that focuses almost exclusively on the Global North. It nevertheless reveals important trends that give shape to life in very large cities. In the “developed world” these places tend to present higher wages, more dynamic markets, better public transportation and amenities, and faster pace of life. They are, however, also characterized by more congested and polluted environments, higher housing prices, crime rates, and income inequality, and, in the case of the US (Okulicz-Kozaryn, 2017), unhappiness levels.

The ability of quantitative and statistical studies to illuminate the ways in which very large urban areas are lived and experienced by their inhabitants is, of course, limited. Understanding how the contradictory tendencies they report play out on the ground, and identifying what other mega-urban dimensions and processes interact with local place and people, warrant more fine-grained empirical studies (Friedmann, 2010; Rao, 2012; Schafran, 2015). As Heide Imai in Chapter 17 remarks: “how ordinary people experience ordinary places is a neglected area of the research on megacities” (p. 247) and this gap means that we are overlooking “rich details of everyday practices, urban informality and varied scales of economic activities, which can tell us much more [than statistical studies] about the ordinary and daily practices that shape a world of megacities” (p. 248).

The three chapters in Part IV of this Handbook, “Mega-urban Life Spaces and Liveability,” tackle this call to produce richer and more grounded accounts of lived mega-urbanism. AbdouMaliq Simone (Chapter 16) apprehends the megacity-region of Jakarta through an

ethnographic approach centred on local landscapes and lifeways. His contribution reveals how young people in a residual inner-city working-class neighbourhood and lower and middle-class households on the city's urbanizing outskirts respond to a mega-urban environment constituted of indeterminate places of becoming, decentred, provisional, and constantly shifting and adjusting. Heide Imai (Chapter 17) attends to the experience of inhabitants of Tokyo's residential alleyways, using their individual voices and stories as her entry points. She approaches the Japanese megacity as juxtaposition of processes of globalization and local resistance, recovery and decay, personal success and failure, and voluntary and forced relocation. Her analysis reveals a problematic disconnect between higher-level governments' vision and plans for the Japanese megacity and the everyday lives, struggles, and initiatives of its inhabitants. Felipe de Alba (Chapter 18) looks at local people's experience and responses to flooding in the Mexico City basin. His contribution sheds light on the affective and emotional responses of people living in six different places adversely affected by metabolic flow of water in the Mexican megacity-region. Moving from inner core to outer periphery, the analysis illuminates the emotional consequences for mega-urbanites of infrastructural failure and the political roots of these problems.

These chapters make a compelling argument for looking at megacities from the inside-out, for understanding them as vast and dynamic assemblages of lived places made and remade by social practices, and for adopting methods centred on the ordinary people who feel, to various degrees and in various ways, the effects of mega-urbanization processes. They emphasize the need for more attention to the sociospatial relations taking form in mega-urban places and for the development of language and analytical tools to capture these dynamics.

The close reading of everyday life offered by each author further stands as a valuable counterpoint to overly economic or boosterish discourse about megacity and megacity-region put forth by metropolitan and national governments, business and industry leaders and other powerful interest groups (see Harrison and Hoyler, 2015 for a critical discussion). These "other perspectives" contribute to understanding how various groups of mega-urbanites navigate more or less successfully the "landscape of the mega" (Benjamin, 2007), what impacts the inclusion/exclusion patterns generated by mega-urbanization have on them, and the ways in which they can – and sometimes do – leverage scalar differences to get a foothold into larger urban networks.

1.5 MEGA-URBAN ENVIRONMENTAL SUSTAINABILITY AND VULNERABILITY

Large-scale urbanization's interrelation with the environment is an enduring theme in the megacity literature and is the theme of Part V of this Handbook, "Mega-urban Environmental Challenges." Already at the turn of the twentieth century, Patrick Geddes was lamenting the poor environmental conditions in the multimillion urban formations emerging on both sides of the Atlantic and the strain these "overgrown cities" put upon natural resources in the regions surrounding them (Meller, 1993). Energy use, pollution, and other environmental sustainability issues related to water and food security, transportation, and public health have since remained central concerns of the scholarship on the megacities and megacity-regions of the Global North and, more recently, the Global South (e.g., Kraas et al., 2009; Silver, 2008; Sorensen and Okata, 2011b; see also de Alba, Chapter 18 and Silver, Chapter 22 in this book).

The last decade in fact saw a growth of environmentally focused studies of such magnitude that, from a strictly quantitative viewpoint, this scholarship now dwarfs research on all other dimensions of megacities and megacity-regions.

The mega-urban phenomenon epitomizes one of cities' key contradictions. The very concentration in space of high numbers of voracious economic activities and consumers that leads to environmental destruction also makes megacities centres of the capacity, ingenuity, and resources to deal with these same environmental issues in sustainable ways (Beauregard, 2018, Chapter 3; Pelling and Blackburn, 2014). As discussed by Rees (Chapter 20 in this book) and Stewart, Kennedy and Facchini (Chapter 19), large-scale urbanization is a profoundly resource-intensive process. The mere maintenance – let alone growth – of megacities and megacity-regions requires the importing of enormous quantities of energy and material from elsewhere and the exporting of similarly large amounts of degraded wastes. The worlds' largest urban agglomerations thus have extremely large and, thanks to global trade networks, geographically dispersed ecological footprints. As Rees (Chapter 20, p. 295) remarks, megacities “ecologically ‘occupy’ an extra-urban area, hundreds to more than a thousand times larger, than their political or built-up areas.”

And yet, by concentrating people in space, megacities can – and sometimes do – enable higher resource efficiency, less carbon-intensive lifestyles, and enhanced quality of life. Megacities' performance on these fronts are, however, highly uneven. Stewart et al. (Chapter 19) compare the Key Performance Indicators of 27 megacities distributed across the globe. This exercise reveals large variations in mega-urban sustainability and quality-of-life profiles. Unsurprisingly, a number of wealthier and “Northern” megacities such as Paris, London, Tokyo, and Los Angeles are cleaner and more resource-efficient than their “Southern” counterparts (a tendency particularly marked for South Asian megacities). The evidence-based portrait provided by Stewart et al. is nevertheless more blurred than what catastrophist accounts of the environmental peril facing megacities of the Global South would lead one to believe.

This is not to say that megacities and megacity-regions of the Global South are not faced with important environmental challenges. The story told by Silver (Chapter 22) of Jakarta's failure to deal with its growing and interconnected water issues in the post-independence period (flooding, lack of potable water, subsidence) is a case in point. In Jakarta, as in many other emerging megacities of the South, the unprecedentedly rapid shift in scale of the urban challenged pre-existing environmental management approaches devised for a much smaller urban place (in this case, colonial Batavia). Silver's chapter is a cautionary tale of the extremely high costs of the failure to protect the commons associated with clean water in a megacity. It also demonstrates the merits of a historical perspective on the environmental problems faced by a relatively new megacity-region. Underpinning Jakarta's current water issues are political decisions about space and place taken over centuries.

Last, but no less critical, are concerns about the world's largest urban agglomerations' increasing sensitivity and vulnerability to climate disruptions. The coastal location of most megacities partly explains their vulnerability in the face of increases in extreme weather events (hurricanes, storm surges), floods, and sea-level rises (Pelling and Blackburn, 2014). But megacities will very likely face other major challenges. Some of these relate primarily to climate variability, such as the dangerous heatwaves to which up to a billion mega-urban dwellers may be exposed by 2100 (Marcotullio, Keßler and Fekete, Chapter 21 in this book). But other challenges lie ahead for mega-urban places that might result from the combination of climate variability with other types of uncertainties and instabilities. “What happens,” Rees

asks in his chapter on the climate-energy conundrum facing megacities, “if the seminal factors and synergisms that enable modern cities are destabilized or disappear altogether? What if new combinations and antagonisms emerge that are aggressively hostile to the existence of megacities?” (Chapter 20, p. 292). How far current trajectories of environmental and social change will shift the balance between opportunity and risk will, as Rees argues, ultimately be an outcome of governance systems, development priorities, and values rather than of technological and economic capacity alone.

1.6 MEGA-URBAN ECONOMIES: MEGAPROJECTS, FINANCIALIZATION, AND TERRITORIALIZATION

Megacities and megacity-regions are often their country’s most important economic centres. As such, they tend to concentrate capital and power at the national scale. Very large urban places also attract important flows of foreign capital. Further, a small proportion of what we might call “global megacities” are primary nodes in the world economy, playing key roles in the operation of global finance and trade. But places such as New York, Tokyo, or more recently, the super megacity-region of Shanghai (see Friedmann, Chapter 2 and Yeh et al., Chapter 25 in this book) are the exception. The roster of megacities and urban regions (see Hoornweg and Pope, Chapter 15 in this book) includes many more urban agglomerations that are much less economically powerful.

That not all large urban places hold the same position in the world economy or are equally prosperous is a self-evident truth. And yet it interrogates pervasive assumptions about the driving role of large-scale urbanization in economic success. Such assumptions build on the positive link between urban size and economic productivity long emphasized by policymakers and academics (see Cardoso and Meijers, Chapter 24 in this book). Despite a scarcity of empirical studies and indications that several other factors are at play (e.g., Frick and Rodríguez-Pose, 2018), a powerful normative discourse has emerged in the last decades about the leading economic role of big cities and urban regions in a globalized economic system. Following this geo-economic logic, large-scale urbanization boosts economic productivity and efficiency due to agglomeration effects (e.g., Scott and Storper, 2015). Moreover, large cities and urban regions have the capacity to drive the integration of entire nations into global economic networks (Florida et al., 2001; Glaeser et al., 1990; Ross, 2009).

Elements of this discourse, widely circulated by global financial and engineering consultancies and international financial institutions (e.g., MacKenzie, Siemens, the World Bank), have found their ways in policies formulated for places as different as the US, the Greater Tokyo region, and the Accra-Lagos corridor. The assumption seems to be that, with the “right policies” the mega-urban can be put in the service of prosperity basically everywhere. What “right policies” tend to mean for the proponent of the “bigger city/urban region is better” discourse is the creation of new supra-urban territorial units aimed to align economic and political systems in space; massive investments into the construction of large-scale infrastructure (such as the transportation and logistics mega-infrastructure discussed by Shatkin in Chapter 23); the development of specialized economic functions; and the integration of domestic property sectors into global finance markets.

With different geographic focuses and distinct analytical approaches, the four chapters in Part VI, “Mega-urban Economics, Real Estate and Property,” critically interrogate the inter-

relations between very large cities and urban regions and the local, regional, and international economic systems within which they evolve. The contributions of Gavin Shatkin (Chapter 23) and Natacha Aveline-Dubach (Chapter 26) show that megacities and megacity-regions are increasingly targeted by international finance and that this factor bears heavily on their emergence and territorial governance. Capital investment, Aveline-Dubach explains, concentrates in very large urban places because their “real estate markets are deeper, local wages higher, and land values [are] expected to increase through denser, high-rise development and infrastructure improvements” (Chapter 26, p. 395). These same factors underpin what Shatkin (Chapter 23) calls the “land–infrastructure–finance nexus” – that is, “the possibility to realize infrastructure investment through the financialization of the land value increases and project-related revenue that will result” (p. 346). His chapter calls for further research into this phenomenon that, he argues, draws much needed attention to the political economy of infrastructure-driven extended urbanization in the Global South in general, and in Asia in particular.

Aveline-Dubach warns that this “rise in power by institutional investors and real estate investment funds operating globally has far-reaching implications for cities, especially for major city-regions where most of the accumulation of capital takes place” (Chapter 26, p. 398). A deeper integration into financial markets exposes mega-urban territories to a potentially more speculative and volatile economic environment. Another problem, highlighted by Shatkin in his analysis of the “land–infrastructure–finance” nexus in Asia, is local and national governments’ tendency to create property and infrastructural investment opportunities tailored to meet the interests of foreign capital instead of or at the expense of local needs.

The relationship of megacities and megacity-regions to capital and investment is not, however, solely economic. Instead, urban economic development and (re)structuring plans, policies, and programmes for megacities and megacity-regions are very often political projects. As explained by Shatkin, national state actors tend to play a central role in these projects, given the need for coordination across the different jurisdictions typically straddled by megacity-regions, given their economic importance in national economies, and when foreign capital is involved such as with infrastructure loans, to provide the national-level government guarantees required by financial institutions.

A telling example of the central state roles in shaping mega-urbanization processes and of attempts to leverage the mega-urban in the service of a national development project is provided by Yeh et al.’s discussion in Chapter 25 of the emergence and evolution of the Pearl River and Yangtze River Delta regions – the so-called “tiger” and “dragon” of the Chinese economy. While the central state’s influence over each region evolved over the last 30 years, its efforts to develop them economically, to guide their spatial expansion, and to restructure their institutional systems are intrinsic components of a larger national development strategy. National states in Japan, Hong Kong, and China also played crucial roles in shaping the manner in which real estate has been financialized on their territories, giving rise to distinct mechanisms (Aveline-Dubach, Chapter 26).

In this same vein, the chapters in Part VI emphasize the long-term, situated, and multi-actor dimensions of mega-urban socioeconomics dynamics. Cardoso and Meijers take this approach in Chapter 24 in their analysis of efforts to integrate dispersed networks or fields of urban settlements in the Netherlands’ Randstad into a more functionally, institutionally, and culturally coherent megacity-region. The authors argue that these processes of metropolization “are intertwined with a variety of distinctive cultural-symbolic aspects changing the scope

of city-regional identities and perceptions of place, as well as political-institutional frameworks supported by different governance arrangements” (p. 361). The case of the Randstad further points to the importance of attending to diffuse and less tangible factors in analysis of metropolization processes, such as cultural proximity and the degree to which territorial identities are shared across vast urban regions.

Ultimately, Cardoso and Meijers encapsulate many of the ideas put forward in this book when they write that the formation of megacities and megacity-regions: “does not happen in thin air, and is driven by forces highly dependent on context” (Chapter 24, p. 361). We further share their conceptions of large-scale and extended urbanization as a series of processes that “cut across different forms of urban space beyond static hierarchies, occur at many simultaneous scales, come in waves, take a very long time, cannot be restricted to a single dimension of analysis or strategy, are always in progress but always incomplete, depend on, and adjust to, specific historical and spatial contexts, and are both the trigger and the product of complex interactions whose emergent properties cannot be anticipated from the observation of their individual components” (p. 372).

Megacities are important, distinctive in their governance, environmental, liveability, and economic challenges, and their roles in current urbanization processes must be better understood. The chapters in this Handbook show that now is not the time to pretend that different scales, densities, and configurations of urbanization are all the same, but that on the contrary it is time to further focus our critical and analytical lenses on the particularities and distinctive issues associated with mega-urbanization processes.

NOTES

1. Recently new “giga” and “meta” city categories have been proposed for agglomerations greater than 20 million.
2. While “urban areas” are most commonly demarcated by a threshold population, they can also be determined by economic criteria (e.g., percentage of labour force engaged in non-agricultural activity), urban characteristics (e.g., extent of paved surfaces or sewerage systems), and administrative boundaries (UNDESA, 2018).
3. See Chapter 3 by Leaf, Chapter 13 by Rae and Nelson, and Chapter 15 by Hoornweg and Pope in this book.
4. That is, when data allow its application. As Kraas and Mertins (2014) remarked, functional urban area definitions call for subnational data (on commuting and employment, for instance) rarely collected by statistical agencies of low- and middle-income countries where most megacities are now located.
5. Some authors define a megacity-region as relating to only one functional city system while a megaregion would have two or more interrelated systems (Harrison and Hoyler, 2015, p. 9).
6. Between 2011 and 2018, John Friedmann initiated two research collaborations involving the editors of this Handbook that have continued to inspire and guide our work. The first was on peri-urbanization in Asia (published in *Cities*, 2016, Vol. 53) and the second was on megaconurbations in Asia (published in *International Planning Studies*, 2019, Vol. 24, Issue 1). The chapter reproduced here was part of John’s contribution to the second project, and was completed a few weeks before his death in June 2017 (see Friedmann and Sorensen, 2019).
7. Cardoso and Meijers (Chapter 24) make a very similar point “By cutting across spaces previously defined as mutually exclusive categories, such as ‘urban’, ‘suburban’, ‘rural’ or ‘natural’, and accentuating their convergence, extensive urbanization redefines the conceptual meaning of cities, reconfigures the location and interaction patterns of urban activities, loosens hierarchies between

places, and transforms their political and economic relations" (p. 360) See also Rae and Nelson (Chapter 13) for a quantitative approach to drawing megacity-region geographies.

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