

In Rozenblat C., Pumain D., Velasquez E. (eds.) (2018). *International and Transnational Perspectives on Urban Systems*, UN-Habitat / Springer Series "Advances in Geographical and Environmental Sciences", DOI: [10.1007/978-981-10-7799-9](https://doi.org/10.1007/978-981-10-7799-9)

Introduction: A global view of urbanization

Denise PUMAIN, University Paris 1, UMR CNRS 8504 Géographie-cités, Paris, France
pumain@parisgeo.cnrs.fr

Celine ROZENBLAT*, University of Lausanne, Institute of Geography and Sustainability, Lausanne, Switzerland
Celine.rozenblat@unil.ch

*Corresponding author

Urbanization and the urban way of life are now universal phenomena across the globe. Symbolically, and for the first time in history, over 50 percent of the world's population is now classified as urban. Even larger proportions of the world's economic activities and social transformations take place in cities, especially larger cities. Although too often described as an "event" or as a challenging turn, this crossing of a threshold does not represent a sudden change in the evolution of the complex urban systems. There is a surprising continuity in the recent history of urbanization in each region of the world that can be modeled and predicted. What is new and may represent a true bifurcation in this history is indeed to be observed in the spatial distribution of urban growth that has shifted from around the Atlantic towards the Pacific regions and African continent and from the richest towards the poorest countries of the world.

This urban process, as it continues to evolve in highly varied manifestations in cities, countries and global regions, offers **opportunities** for both increasing prosperity and reducing global poverty; it also presents **serious challenges** for local and national governments and agencies, as well as for international organizations. The basic challenge is two-fold: on the one hand, each city and each nation state must find ways to address the immense problems generated by the new realities of urban growth and change, including uneven development, entrenched social inequalities, widespread environmental degradation and climate change; while at the same time, they must take advantage of new economic, technological and cultural innovations to remain politically stable, socially cohesive and globally competitive.

Under these circumstances, it is timely – and indeed urgent – for social scientists and planners to offer a balanced overview of the current consensus of new scientific research on urbanization and to evaluate ongoing debates on theory, methods and public policies. This book is intended to do precisely this. It updates the general state of knowledge on urbanization, viewed through the lens of the evolution of urban systems at the global level. For many researchers, this necessitates understanding cities not only in terms of their inherent dynamics and intrinsic diversity but also, and most importantly, through their mutual interdependences. Indeed, we argue that **cities have to be understood** not simply as individual entities but **as parts of broader systems of cities** at different spatial scales – from regional to national and global – because their future is increasingly influenced by the numerous linkages and interactions, including both direct and indirect interactions, linking them all together.

Cities and systems of cities within perturbations at the end of 20th century

Thirty years ago, a book edited by Larry Bourne, Robert Sinclair and Kazimier Dziewonski provided the first worldwide overview on “*Urbanization and Settlement Systems*” from a systemic perspective. By means of **comparative analyses** of the spatial patterns and functional organization of cities within national states in various regions of the world, the book widely confirmed the meaningfulness of observing cities not as isolated entities but, as coined in a famous formula by Brian Berry, as “*systems within systems of cities*” (1964). The book edited by Bourne *et al.* (1984), which mainly compared national urban systems from American and European countries according to a West-East typology of state economies, identified many similarities across urban systems and their evolutionary histories. This revealed how much urban trends and structures were becoming increasingly global. It also led to considerations of the new science of complex systems as a source of methodological inspiration for analysis and comparison.

Since that publication, dramatic perturbations have transformed the world. It is worth recalling that the Eastern/Western line of division has disappeared and that a more multi-polar international system has emerged. The rise of economic globalization has affected all parts of the world, and the World Trade Organization was established in 1995 (replacing the GATT¹ of 1948) to regulate the growing number of bilateral and regional agreements. The

¹ General Agreement on Tariffs and Trade

development of communication technologies has fostered wider social and cultural globalization according to the increasing speed at which information circulates. Extreme poverty has been reduced, and several emerging countries now play growing roles on the international scene. However, income inequalities at many geographical scales have never been as high as they are today: across countries, they have multiplied by approximately 70 in terms of income per person since 1900 (Piketty, 2014). Although these transformations were not urban *per se* (Scott & Storper, 2015), they were largely instigated by urban stakeholders and, at the same time, widely influenced the changes in cities. The following are major consequences of urban quantitative and qualitative developments: the world's urbanized population surpassing 50%; reinforcement of national urban systems hierarchies; uneven regional (infra-national) development; transfer of governance towards large metropolises through decentralization of economic development policies; and implementation of multi-level governance systems among states, regions and urban localities.

To assess the **impact of such perturbations on the capacity for resilience** among systems of cities, we invited all authors in this book to expand their investigation over a rather long period of time, starting in approximately 1950. This ensures better comparability of the evolutions that are observed in all parts of the world and avoids reifying some of the overly short-term fluctuations that are so frequently observed in the dynamics of urban systems.

Comprehensive urban systems rather than World cities

The IGU Urban Commission, “Urban challenges in a complex world”, in collaboration with the United Nations – Habitat, felt it necessary to explore these changes and **update our knowledge of cities** by looking at the most recent information available on the evolutionary trends of the world's urban systems. During the last thirty years, many books on urban issues have underlined the emergence of ‘world cities’, ‘global cities’, ‘mega-cities’ or other ‘Worlding cities’ (Brunn *et al.*, 2008; Roy & Ong, 2011; Sassen, 2012; Scott, 2012; Taylor *et al.*, 2012; Jacobs, 2013). However, the majority of urban citizens do not live in these very large urban concentrations: in 2014, United Nations accounted for less than 15% of urbanites living in agglomerations larger than 5 million inhabitants while 52% still lived in those below 500 000 inhabitants (UN, 2014). We think it is important to analyze **urban dynamics at all levels of the systems of cities** by including small towns and medium cities as well as metropolises. Indeed, the interdependencies among urban centers of all sizes sustain the global processes of change, as cities co-evolve in a polycentric world. If we admit that the

largest metropolises trigger changes among leading global cities and widely influence their own territories at continental, national or regional levels, we assume that their development is directly dependent on the very large number and functional diversity of small towns and medium size cities, which create the conditions of innovation dissemination and thus contribute to globalization processes.

National, continental and worldwide urban systems

From the projections by United Nations (2014) it appears that in 2030 two thirds of the world urban population will be concentrated in the poorest countries. Since the 1950s, a dramatic shift has occurred in urbanization at the global scale that is usually made visible from the evolution of the top list of world cities but affected in fact the totality of urban hierarchies. In the middle of 20th century, most of the largest metropolises were located in the more industrialized countries belonging to the OECD (Organization for Economic Cooperation and Development), among which New York, London, Paris and Tokyo are prime examples. On the eve of the 21st century, if we look at the list of megapolises concentrating more than 10 million inhabitants each, many new names have emerged. They are mostly located in less wealthy countries in Asia, South America and Africa and include Beijing, Shanghai, Guangzhou, Delhi, Mumbai, Manila, Sao Paulo, Mexico City, Cairo and Lagos. These cities lead the global rankings according to the metric of number of residents, while they remain much lower on the hierarchy when the values of production and income are considered. Major urban policy issues are related to the potential tensions created by these new asymmetries at the global scale. Many chapters in this book do enlighten the multi-scale consequences of these emerging metropolises, from regional, national to continental levels.

Indeed, the world has not become as flat as described in Friedman's (1985) futurist vision to support the idea of a unique world urban hierarchy. It would be an exaggeration to argue, as many globalization studies do, that all cities can be ranked according to a unique world pattern (Taylor, 2001; Hennemann *et al.*, 2015). In fact, boundaries still matter, and national and regional factors induce strong cohesions where cities are – together – dependent on common geopolitical, economic, social and governance systems (Polese, 2005; Therborn, 2011).

Dividing the world into appropriately relevant zones when analyzing the systems of cities is, however, not so simple. Since the previous period of the predominance of nation states, two

contradictory “rescaling” trends have emerged that seem to accompany the reinforcement of territorial inequalities (Brenner, 2009). On the one hand, new levels of infra-national governance have been empowered through decentralization, especially in terms of economic and spatial planning policies (Scaling-down) (Lin, 2009; Wu, 2016). On the other hand, enlarged connections have been created inside nation-states or within multi-state free trading zones, such as the European Union, the ASEAN (Association of Southeast Asian Nations) and Mercosur (*Mercado Comùn del Sur*) in South America (Scaling-up), where cities become stronger nexus in these global networks widely driven by neo-capitalist processes. However, because cities often lack of adapted governance and the amount of tax resources permitting them to face private productive or real estate actors, these two opposite directions of scaling processes must be addressed at the levels of national and continental urban systems.

This book outlines the reactions and adaptations of a set of urban systems at the national or continental scale that are participating in these two levels of rescaling processes in the context of the global urban rebalance. As much as possible, we have chosen to completely **cover all parts of the world**. After a close examination of the global patterns of financial linkages which are currently driving a large part of the co-evolution of cities in the world, we retain a classification of countries and regions according to their level of development, their stage in the urbanization transition and their geopolitical trajectories (especially regarding the periods of settlement and colonization) because these three factors have proven highly influential in determining the structure and evolution of systems of cities (Bretagnolle & Pumain, 2010). The related partition adopted in designing the chapters of the book will be detailed below.

Conceptualization of cities and urban systems at the world scale

Despite recurrent criticism of the relevance of urban comparisons made at the world scale (Brenner, Schmitt, 2014; Robinson & Roy, 2015), we consider cities to be geographical entities that are produced through a common (universal) process of concentration of people and activities. Urban stakeholders not only co-settle and interact locally but also develop long distance exchanges, mostly aiming to maintain and expand the economic and social values of their urban assets. These two-level urban processes allow the further emergence of social and economic innovations and their diffusion to surrounding or linked spaces. Traces of the two processes that led to the emergence of systems of cities, either as central places rooted in local economic networks (Christaller, 1933) or as hubs on the itineraries of long distance trade networks, are more or less still perceptible in the respective positions and roles of cities.

Indeed, many “old” central places still represent the nodes around which long-range networks developed during the last 70 years. Local and regional networks did not disappear but rather created the initial conditions of territorial constructions that oriented the variety of ways in which cities integrated unevenly in globalization.

The **diversity of systems of cities** also originates in the history of national economies and the geopolitics of colonization. While in some regions, such as Western Europe or North America, the urban transition was quite advanced in 1950, in other countries it was only at its early stage. In some cases, strong national policies tried to accelerate it, as in Japan or Korea, or to slow it down, as in the communist countries. However, more often, countries faced difficulties in resisting the universal tendency for jobs to concentrate in urban areas while many workers in the countryside became unemployed due to agriculture’s transformation by modern production. As a consequence, the post-Second World War evolution produced strongly different urban trajectories. It results a large variety of urban situations that are now facing the challenges of the next ecological transition in this century.

Updated urban issues, theory and methods

In the context of knowledge and information societies, new tendencies in the long/medium term evolution of urban systems, together with new data and methods, require that prior theoretical assumptions and conceptualizations be challenged as global urban hierarchies are reconfigured. The main processes acting upon urban areas are being redefined at all geographical scales. The connections among urban systems become more and more relevant for understanding the transformations of cities. Especially, the **emergence of a transnational subset of cities** must be analyzed along with the still-well-structured national urban systems in which small towns and large cities continue their already **longstanding co-evolution**.

Major issues in contemporary urbanization seem to be of growing relevance to all types of cities in every region of the world. The globalization of finance and the associated new international division of labor have created more and more narrow linkages between urban economies, while increasing national and international migrations coupled with the expanded diffusion of electronic communication propagates information more rapidly than ever before, favor cultural hybridization. We believe that **complementarities are more essential than are rivalries and competition** in these processes; and we prefer to draw well informed typologies of such geo-diversity rather than present rankings established based on partial indicators.

However, this book also insists on more subtle interdependencies that are perhaps less easily perceived, such as the possible growing tension between alternative measurements of the importance of cities, whether in terms of population or in terms of wealth. For example, tension may increase because the richest cities are frequently those where populations are shrinking, whereas the poorest cities often have young and growing populations that could lead to “*a planet of slums*” (Davis, 2006).

There is a risk of a **disruptive trend** when the necessities of urban development are increasingly confronted by the significant requirements of managing a global ecological transition. It is still uncertain whether digital technologies and new devices, as well as the participatory policies involved in so-called “smart cities”, will ensure sustainable urban development. Although recent urban growth has been paralleled by a global increase in income level per inhabitant, thus contributing to reducing urban poverty at the world scale (World Bank, 2009), it seems that inequalities in income and quality of life may have increased locally within most of cities.

Because these processes create tension, or even conflicts, within a pattern of widely diverse urban situations, it is not possible to draw plausible scenarios for the future of cities by merely projecting recent trends in a linear fashion. The methodologies derived from the **sciences of complex systems** bring about new forms of intelligibility regarding these urban dynamics. A variety of tools and methods have been developed during the last fifty years for analyzing the structure and evolution of complex systems. Many of them have been tested on urban systems at different scales of spatial and statistical analysis, developing a true “*science of cities*” (Portugali, 2012; Batty, 2013; Boulton *et al.*, 2015). Therefore, in this book, urban hierarchies are systematically investigated using Zipf’s law or lognormal distribution for city sizes. Statistical tools derived from scaling laws enable to complete a classic analysis of urban functions at different levels of centrality and of governance trends, and network analysis allow comparing the positions of cities in a more precise way. The conception of cities as complex adaptive systems also integrates the complementary knowledge accumulated from the simulation tools that encapsulate the major stylized facts of urban dynamics using cellular automata at the local level or multi-agent systems for multi-scale modeling (White *et al.*, 2015; Heppenstahl *et al.*, 2012; Pumain, Reuillon, 2017).

Originality of this book’s contents

The main objective of this book is to review the recent worldwide, regional and national evolutions of urban systems (comparative studies on long- and medium-term dynamics and history at relevant geographical levels) in order to **revise the theoretical fundamentals of urban systems**. The ambition is to sustain reflections on multi-scale urban governance and energetic transition, whether local, within national systems or linked to the expansion of transnational networks.

To detect similarities and differences in the impacts of global processes of change, the **comparative aspect is a critical point**. From this perspective, we simultaneously aim at producing comparative material and at adapting this material to local conditions and to specific institutions and contexts. The authors who collaborated to this state, agreed to work according to a common template with some compulsory indications – such as covering the whole urban system and the period from at least 1950 to 2000 – but, they were free to contextualize their chapters by emphasizing the specific stages and challenges that were encountered in their urban system. Scholars from different parts of the world were associated with each chapter of this book, which ensures that this common theoretical perspective is not superimposed on the local reality but rather properly rooted in a specific understanding of the urban environment.

In the first part, we explain the **contribution of geographical theory** to a better understanding of urban systems. A first chapter develops a theoretical concept of urban systems as socio-spatial adapters; this assembles the major distinctive features of the urban realm and explains the diversity of cities based on the general dynamics of their evolution. A second chapter explores the particular processes occurring recently in the accelerated globalization of urban systems, especially through **multinational firms' networks**. A third chapter presents a preliminary typology of the systems of cities around the world according to their **specific trajectories** during the last half-century and new expected trends; this typology introduces the following chapters of the book.

The second part is dedicated to the urban systems of world regions that have achieved their urban transitions – a universal process through which our habitation of the planet shifted from rather homogenous and scattered patterns of small villages, towards much more concentrated, heterogeneous and hierarchized patterns of urban settlements. During the last stage of that transition, the evolution was characterized by a growing concentration of innovative functions into metropolises. In these **completely urbanized regions** that are also among the world's

wealthier ones, a major raising concern is to determine to what extent the future may be – to varying degrees – threatened by aging populations and shrinking towns. USA (chapter 4), Canada (Chapter 5), Europe (Chapter 6) and Japan (Chapter 7) are representative of such trends. How each of these urban systems will manage the challenge to maintain technological advancement while moderating growing gaps between social groups?

The third part examines the special cases of **Latin American** countries that have already reached high urbanization rates but at a much lower income level than the industrialized countries mentioned above (Chapter 8). As the demographic transition in those countries is relatively recent, urban growth may still be booming and sustaining significant economic development but could be hampered by strong income inequalities both between and within cities. The Brazilian urban system is deepened in order to give example of the difficulties encountered by national urban policies (Chapter 9).

The fourth part of the book analyses the **booming regions** where the urban transition is still in full swing. These regions are confronting the major issues of urban development, although their urban evolutions seem to contrast sharply. They raise very interesting theoretical questions that concern governance parties' at all territorial levels: to what extent specific patterns of urban systems may emerge under common constraining processes because of the political choices as applied to different social and cultural contexts? Comparing the largest countries, China (Chapter 10) and India (Chapter 11), could appear as a true experimental design since rather different paths were chosen, either controlling politically the urban expansion or letting more diffuse urban forms disseminate, while rural populations adapt. Because of the drastic bifurcation in its political and economic orientation, Russia is another exemplary form of experiencing urban transition (Chapter 12): how very slow urban growth can result in a dramatic reorganization of a system of cities? South Africa (Chapter 13) offers another example of a striking transition occurring after racial segregation and displaced urbanization, so specific that one wonders how its recent stages of urban development may share so many features with other BRICS countries (Brazil, Russia, India, China and South Africa).

The fifth part of the book is dedicated to the **low- and middle-income countries** where, in general, the urban transition is still at work but is proceeding in a variety of geographical contexts. Which are the specific difficulties in the urban systems of most of Africa (Chapters 14 and 15) and Southeast Asia (Chapter 16) while entering more or less intense stages of the

urban transition?

This global overview of diverse urban systems situations and answers in the world actually adds some reflections and recommendations to the “*urban system framework*” proposed in Habitat III agenda. In fact, despite the name “urban system” given to this ambitious agenda, the systemic perspective is not yet put in application. The “*City Resilience Profiling program*” (CRPP) that followed by implementing methodologies and indicators on 10 pilot projects was inaugurated in October 2016 in Quito. But in this program few attentions were paid to the **mutual interactions** between cities at regional or global scales (Citiscopes, 2015; Marino Castro, 2017). The Un-Habitat (2015), defines the resilience as a key concept for urban planner, local governments and business to explain the interconnected nature of urban planning with social, economic and environmental levels, forming “...linkages between how urbanization that results in sprawl not only disconnects residential areas from sources of livelihoods, but can also perpetuate a reliance on high-emission, fossil fuel-generated energy and transport systems” (Habitat III, 2015). Habitat III agenda incorporates urban complexity concepts and methods concerning socioeconomic - political - cultural crises as a whole connection of hazards in urban “ecosystem” (*sic*), but this complexity remains embedded at local scale (Kuecker & Hall, 2011; Habitat III, 2015). This is not only a local issue that was already underlined by Castells in 1972, but it overall calls to a multi-level approach of governance. Thus this book intent to fill this gap and to establish an agenda envisaging resilience at both levels of local and regional/global issues.

References

- Batty M. (2013). *The new Science of Cities*. Cambridge (Mass.), MIT Press.
- Berry B.J.L. (1964). Cities as systems within systems of cities, *Papers of the Regional Science Association*, 13, 147-163.
- Boulton J.G., Allen P.M. & Bowman C. (2015). *Embracing complexity, strategic perspectives for an age of turbulence*. Oxford University Press.
- Bourne L., Sinclair R., & Dziewonski K. (1984). *Urbanization and Settlement Systems*, Oxford University Press.
- Brenner N. (2009). Restructuring, rescaling and the urban question. *Critical Planning*, 16(4), 61-79.
- Brenner N. & Schmid, C. (2014). The ‘urban age’ in question. *International Journal of Urban and Regional Research*, 38(3), 731-755.
- Brunn S.D, Hays-Mitchell M. & Zeigler D.J. (2008). *World regional urban development*, Fourth edition, Rowman & Littlefield Publishers, Lanham, 647 p..
- Bretagnolle A. & Pumain D. (2010). Simulating urban networks through multiscalar space-time dynamics (Europe and United States, 17th -20th centuries), *Urban Studies*, 47, 13, 2819-

2839.

Castells M. (1972). *La question urbaine*, Série Sociologie, Maspero, 529 p.. English translation (1979). *The urban question. A Marxist approach*. The MIT Press. 502 p.

Christaller W. (1933). Central Places in Southern Germany. Translation into English by Carlisle W. Baskin in 1966.

Citiscope. (2015). *What is Habitat III?* Retrieved from Toward Habitat III: <http://citiscope.org/habitatIII/explainer/2015/06/what-habitat-iii>

Davis M. (2006). *Planet of Slums: Urban Involution and the Informal Working Class*

Hennemann S., Derudder B., & Taylor P. J. (2015). Cutting the Gordian knot of visualizing dense spatial networks: the case of the world city network, 2013. *Environment and Planning A*, 47(6), 1332-1340.

Heppenstall A. J., Crooks A.T., See L.M., & Batty M. (eds) (2012). *Agent-based Models of Geographical Systems*. Springer, Population Studies, 721-738.

Jacobs A.J. (ed.) (2013). *The world cities: Contrasting Regional, National and Global perspectives*, Routledge,

Kuecker, G. D., & Hall, T. D. (2011). Resilience and community in the age of world-system collapse. *Nature and Culture*, 6(1), 18-40.

Lin, G. C. (2009). Scaling-up regional development in globalizing China: local capital accumulation, land-centred politics, and reproduction of space. *Regional Studies*, 43(3), 429-447.

Marino Castro D. (2017). *The networking structuration processes of urban resilience concept in the Habitat III agenda*, Master Thesis, University of Lausanne.

Polèse, M. (2005). Cities and national economic growth: a reappraisal. *Urban Studies*, 42(8), 1429-1451.

Portugali J. (2012). *Self-organization and the city*. Springer Science & Business Media.

Pumain D. & Reuillon R. (2017). *Urban dynamics and simulation models*. Springer International, 136 p.

Robinson, J. & Roy, A. (2015). Global urbanisms and the nature of urban theory. *International Journal of Urban and Regional Research*.

Roy, A., & Ong, A. (Eds.). (2011). *Worlding cities: Asian experiments and the art of being global* (Vol. 42). John Wiley & Sons.

Rozenblat C., Zaidi F., & Bellwald A. (2017). The multipolar regionalization of cities in the multinational firms' networks, *Global Networks*, 17(2), 171-194.

Sassen S. (Ed.) (2012). *Cities in a World Economy*, Sage, 4th edition, 398 p.

Scott A. J. (2012). *A world in emergence: cities and regions in the 21st century*, Edward Elgar, 223 p.

Taylor P. J. (2001). Specification of the world city network. *Geographical analysis*, 33(2), 181-194.

Taylor, P. J., Ni, P., Derudder, B., Hoyler, M., Huang, J., & Witlox, F. (2012). *Global urban analysis: A survey of cities in globalization*. Routledge.

Therborn, G. (2011). End of a paradigm: the current crisis and the idea of stateless cities. *Environment and Planning a*, 43(2), 272-285.

United Nations (2014). World urbanization prospect. UN Department of Economic and social affairs.

- White R., Engelen G. & Uljee I. (2015). *Modeling cities and regions as complex systems*. Cambridge (Mass.), MIT Press.
- World Bank (2009). *Annual Report: Geography, Reshaping Economic*. The World Bank, Washington DC.
- Wu, F. (2016). Emerging Chinese cities: Implications for global urban studies. *The Professional Geographer*, 68(2), 338-348.