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Book review

Resilient Urban Futures, Zoé A. Hamstead, David M. Iwaniec, Timon McPhearson, Marta Berbés-Blázquez, Elizabeth M. Cook, Tischa A. Muñoz-Erickson (Editors). Cham, Switzerland: Springer Nature, 2021. ISBN 978-3-030-63131-4 (eBook)

The book "Resilient Urban Futures" is part of "The Urban Book Series", edited by the prestigious Springer publishing house. This series is a resource for urban studies and geography research, and "it provides a unique and innovative resource for the latest developments in the field, nurturing a comprehensive and encompassing publication venue for urban studies, urban geography, planning and regional development" (p. ii). The series publishes peer-reviewed volumes related to urban world issues, such as urbanization, sustainable urbanism, governance, green cities and many others.

The audience to which this series is addressed consists of academics and professionals such as urbanists, geographers, planners, engineers, architects, policy makers, and to all of those interested in urban studies. The book reviewed here is also for students with interests in this field. Unlike other books in the series, this book is published in an open access format, so the information can be accessed for free and quickly, especially now, when "the coupling of a major demographic transition to urban living with climate change (…) presents an increasingly urgent challenge to urban society and decision makers" (p. 2). This book "seeks to advance an urban system research-practice that brings together diverse knowledge, skills, tools, perspectives, and ideas. The objective of this transdisciplinary approach is to build actionable and anticipatory knowledge for decision-making" (p. 4).

The contributors of the chapters are researchers from the Urban Resilience to Extremes Sustainability Research Network (UREx SRN). This is a network of "collaborating interdisciplinary researchers and practitioners from diverse world cities working together to promote, design, and implement urban infrastructure that is resilient in the face of future extreme events, provides ecosystem services, improves social wellbeing, and exploits new technologies in ways that benefit all segments of urban populations" (p. 2). The network consists of over 180 researchers (with different level of expertise and which represent disciplines within engineering, life, physical, and social sciences), 21 institutions and over 220 practitioners (governmental officials – city, county, and state level –, community organization leaders, nongovernmental organizations, business leaders, and others) in nine cities

of the United States of America and Latin America.

The chapters in this book consider the past, present, and future challenges for cities to build resilience; the book appeared in the context of climate risk for cities and in the context of growing interest for the concept of resilience and its application to urban systems, and it describes some tools for engaging communities in resilience strategies. The text is based on practical experience from nine American cities: in United States of America (US), Miami (Florida), Baltimore (Maryland), New York and Syracuse (New York), Portland (Oregon), Phoenix (Arizona); and, in Latin America and the Caribbean, Hermosillo (Mexico), Valdivia (Chile), and San Juan (Puerto Rico). It provides a social–ecological–technological systems (SETS) perspective on promoting and understanding resilience and it does this in 12 chapters, written by over 20 authors with different levels of expertise (such as assistant professors, postdoctoral researchers, professors).

The book has two sections: the first one (Chapters 2–5) focuses on understanding urban social (S), ecological (E), and technological (T) vulnerabilities and resilience, while the second one (Chapters 6–12) applies these insights to an innovative framework that guides city stakeholders.

The first chapter, which constitutes the introduction of the book, presents the theoretical framework and the methodological approaches of the book, being focused on how cities experience disasters, adapt to climate change issues, and transform for a more resilient urban future. The concept of resilience is also presented; it has many definitions, but for the purposes of the book it was adopted the one that comes from ecology, because it is seen as a property of a dynamic system: "Resilience is the capacity of a system to maintain its basic structure, function, and identity while undergoing change in the face of shocks and stresses" (p. 2).

Because the cities concentrate people and infrastructure and are often located along coasts or rivers, the editors consider them to be "often the places most vulnerable to disasters" (p. 1), and also the places where the disasters have the biggest impacts; consequently, the book begins with an impactful image: "If one were to imagine that each time a disaster or stress strikes people on the earth, a strong beacon would illuminate – like an alert board but extended across the globe – then the cities of the world would frequently light up" (p. 1).

It is important to mention that the UREx SRN approach to resilient urban futures has two key elements: social–ecological–technological systems (SETS) and network interactions. The UREx SRN has developed SETS into a comprehensive epistemological framework for understanding and promoting resilience. In this

framework, the social, ecological, and technological components of a system are all considered, and resilient strategies integrate all three domains and their interactions. Because extreme events (such as floods) often cause simultaneous and/or cascading impacts, the failures or inadequacies in built infrastructure and also in resources, institutions, and information systems (components of the urban SETS) to prepare for and respond to this kind of events are fully demonstrated.

The impacts occur among interdependent human, climate-biophysical, engineered systems, and solutions that address only one system domain are unlikely to prove resilient in the future; consequently, this book "suggests a fundamental rethinking, reanalysis, and remaking of cities as social–ecological–technological systems (SETS). By adopting the SETS framework, the UREx SRN places priority on integrating equity considerations into all projects. Consideration of equity asks us to examine the legacies and continued impact of discrimination (…) that have produced differential vulnerability today" (p. 3). For this purpose, UREx SRN researchers have advanced the concept of safe-to-fail infrastructure, which "may incorporate natural elements but principally is a new way of thinking about infrastructure under uncertain and changing probabilities of extreme events. In this framing, instead of being designed to withstand events of a certain magnitude, infrastructure systems are conceived as flexible, multifunctional, and able to adapt or transform through the interactions of S, E, and T" (p. 3).

Throughout this book, the authors discuss conceptual and methodological approaches toward sustainable and equitable futures while contributing to urban systems science. Every chapter has a specific and important contribution to advance knowledge in this field.

As specified above, the first section of the book (Chapters 2–5) has the role to reveal the significance and importance of SETS in the urban context. Thus, in Chapter 2 the example of Puerto Rico is presented to trace ways in which colonialism, land use change, and scientific and political narratives all work together to reinforce societal inequity; the chapter "describes how economic and political institutions produced the climate crisis in ways that also constitute a humanitarian crisis, inscribing climate inequity into the urban built environment and institutions" (p. 11), because it is important to understand the historical processes through which the existential and ethical crises came about. In Chapter 3 an important idea is exposed: "The SETS perspective is an important aspect of envisioning urban futures because cities are considered as systems, meaning we cannot consider parts of cities –

institutions, ecosystems, built environment, and communities – in isolation since they interact to form the whole" (p. 30). This chapter also provides a codebook for doing content analysis of municipal planning documents. Chapter 4 explores the spatial patterns of vulnerability to extreme events which are manifestations of structural injustice that leave their mark on the built environment, and also the socio-spatial segregation patterns which are aligned with patterns of exposure to extreme events. This is important for prioritizing where and how cities should make investments for mitigating the impacts of extreme events. The authors of Chapter 5 demonstrate the value of knowledge systems analysis as a method to stress-test and identify weaknesses of a knowledge system that warrant attention.

In the second section of the book (Chapters 6–12), these insights are applied to an innovative framework that guides city stakeholders. In Chapter 6 the authors present the UREx SRN framework for scenario development of positive urban futures. In Chapter 7, the process of co-production in which UREx SRN participatory scenario development takes place is described. Chapter 8 presents a multi-criteria assessment used to explore the resilience, equity, and sustainability dimensions reflected in scenario visions in a qualitative manner (RESQ). In Chapter 9, land use modelling techniques to produce and evaluate spatially explicit urban futures via the UREx SRN scenario co-production process are introduced. In Chapter 10, Sauter et al. present a data visualization approach as an interactive web application to visualize urban SETS, for anticipatory knowledge. In Chapter 11, the authors present the anticipation as a critical component of building resilience and the need to embed anticipatory thinking in urban planning practices and knowledge systems. This chapter introduces "anticipatory resilience" as a futures-oriented knowledge system. Chapter 12 discusses the importance of systems thinking, the need to advance development of an urban systems science but also an urban systems practice. Also, the contributors state that the positive visions can support the development of more transformative plans, policies, and actions to guide the decisions "toward the building of a longer term, more just, more resilient, and more sustainable world. In short, positive visions are critical to guide urban planning, motivate actions, inspire innovative strategies, and move toward transformative change" (p. 174).

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