

*Springer Book Series:*

# RESILIENT CITIES: Re-thinking Urban Transformation **BOOK 2[BK2]**

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## **TITLE**

**URBAN RESILIENCE: METHODOLOGIES, TOOLS AND EVALUATION**

## **KEY WORDS**

Global trends, urban socio-ecosystems, urban resilience, urban sustainability, urban resilience indicators, urban resilience evaluation, modelling and scenarios, geographic and conceptual information systems, multi-inter-trans-disciplinarity.

## **SCOPE**

The analysis of urban resilience is currently an open research field, for which there is no consensus or mainstreamed approach yet; it is thereby necessary to build new conceptual approaches, rethinking the principles of urban resilience including ontological, epistemological, methodological and axiological assumptions. The crisis of sustainability and resilience for cities presents the following complications: a) the existence of multiple and diverse systems with a complex interaction, b) multiple dimensions and levels of analysis, c) multiple stakeholders and institutions which are affected and which have different worldviews.

The transition to urban sustainability and resilience requires a systemic view, new strategies, decision support systems and frameworks, methodologies, tools and evaluation procedures for multi-level governance; as well as the integration of risk-management, mitigation and adaptation, within a self-adaptive, proactive and participatory frame. Thereby a transdisciplinary approach for urban resilience, in the wider frame of sustainability paradigm, is needed; and it should be coupled with a systemic vision to implement synergic transformative actions.

Cities need to increase their knowledge base, and strengthening the science-policy interaction, to properly assess their current situation, the urban-regional metabolism dynamics and to increase socio-ecological sustainability and resilience facing global challenges. The co-creation of an accessible and transparent base of knowledge can lead to a better understanding of the urban socio-ecosystems' strength and weaknesses, as well as to raise awareness of urban diversity, creativity and social capital.

There are currently no consistent sets of indicators able to fully tackle the multidimensionality of urban resilience; thereby it is necessary to further develop resilience indicators and prospective models, which can reinforce risk management and generate opportunities. Urban resilience evaluation depends on a coherent understanding of the underlying concept of risk and the socio-ecological interactions of urban and regional systems, which rely on natural capital to implement nature-based solutions.

Measurements and evaluation tools, including new information technologies, geographic and conceptual information systems, are essential to assess the climate change impacts, risks and vulnerabilities; moreover, resilience and disaster risk reduction assessment should be part of any comprehensive urban sustainability strategies.

This volume compiles conceptual works and case studies —related which methodologies, tools and evaluation frameworks— which are deemed useful so as to guide urban transition towards resilience and sustainability

## TOPICS

ID	TOPICS	DESCRIPTION
T1	<b>Urban resilience approaches and paradigms</b>	Given the uncertainty and risks associated with global change and climate change that cities and regions face, the concept of urban resilience arises to address systemic challenges and guide the urbanization process within the paradigm of sustainability
T2	<b>Complex systems methodologies for urban resilience and sustainability, including multi, inter and transdisciplinary approaches</b>	A systemic vision and inter/trans-disciplinary approaches for urban resilience are necessary to complement “normal science” and to implement synergic transformative actions. Conceptual advances on inter/transdisciplinary approaches are central to analysing urban sustainability and resilience, and to develop solutions to the complex problems of urban systems
T3	<b>Tools, indicators and modelling for urban resilience</b>	This topic aims at advancing in the measurement and evaluation systems of urban resilience and sustainability through the development of indicators and dynamic models that better reflect the complex interactions and the metabolic relations of cities and regions. The base of knowledge should be increased to boost the “science-policy interface” in decision-making. This including also of new approaches for the development indicators and prospective models to assess urban resilience policies and to support a governance systems at the bio-regional level.
T4	<b>Geographic information systems and conceptual information systems.</b>	Cartography allows the development of maps and information systems guiding both geographic and conceptual exploration that can facilitate the communication among experts, in the frame of complex and multidimensional contexts, while enabling the identification of conceptual regions that have not been explored or developed yet.
T5	<b>New approaches in evaluation in context of urban resilience.</b>	Conventional approaches for evaluation do not appear to be contributing sufficiently to the achievement of urban resilience, thereby it is necessary to build a conceptual platform based on new set of ontological, gnosiological, methodological and axiological assumptions that can facilitate the development of the new approaches of urban resilience.

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