Cities and Nature

Series Editors

Peter Newman, Sustainability Policy Institute, Curtin University, Perth,
WA, Australia

Cheryl Desha, School of Engineering and Built Environment, Griffith University,
Nathan, QLD, Australia

Cities and Nature fosters high-quality multi-disciplinary research addressing the interface between cities and the natural environment. It provides a valuable source of relevant knowledge for researchers, planners and policy-makers. The series welcomes empirically based, cutting-edge and theoretical research in urban geography, urban planning, environmental planning, urban ecology, regional science and economics. It publishes peer-reviewed edited and authored volumes on topics dealing with the urban and the environment nexus, including: spatial dynamics of urban built areas, urban and peri-urban agriculture, urban greening and green infrastructure, environmental planning, urban forests, urban ecology, regional dynamics and landscape fragmentation.

More information about this series at <http://www.springer.com/series/10068>

Jürgen Breuste
Editor

Martina Artmann · Cristian Ioja · Salman Qureshi
Co-Editors

Making Green Cities

Concepts, Challenges and Practice

Springer

Editor

Jürgen Breuste
Department of Geography and Geology
University of Salzburg
Salzburg, Austria

Co-Editors

Martina Artmann
Landscape Change and Management
Leibniz Institute of Ecological Urban
and Regional Development
Dresden, Sachsen, Germany

Cristian Ioja
Center for Environmental Research
University of Bucharest
Bucharest, Romania

Salman Qureshi
Department of Geography
(Landscape Ecology)
Humboldt University of Berlin
Berlin, Germany

ISSN 2520-8306

Cities and Nature

ISBN 978-3-030-37715-1

ISSN 2520-8314 (electronic)

ISBN 978-3-030-37716-8 (eBook)

<https://doi.org/10.1007/978-3-030-37716-8>

© Springer Nature Switzerland AG 2020

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

Making Green Cities has become a goal that is currently being pursued all around the world. More green spaces and more nature within the cities are the aim of the Green City approach. Many cities have already recognized the value of urban nature and are promoting the (re-)integration and protection of urban green spaces and thus urban nature on different scales such as regional green networks, urban parks, forests, community gardens, street trees and blue infrastructure. Urban residents demand this in order to have better living conditions in cities. Urban green spaces and nature are important nature-based solutions addressing societal challenges such as climate change and biodiversity loss. In an era of rapid urbanization and the need to develop sustainable cities (see also the United Nation's Sustainable Development Goal 11), the Society for Urban Ecology (SURE) has decided to develop this book in order to bring together the existing international and interdisciplinary knowledge on urban nature and Green Cities, its benefits and methods of implementation for interested students, researchers and practitioners. The book provides theoretical and conceptual knowledge on the Green City as well as related empirical studies by SURE members from around the world.

The book begins with a theoretical introduction on the subject of the Green City. Based on relevant books and recent research, three concept chapters present recent concepts related to green cities such as urban green infrastructure, urban nature-based solutions and urban ecosystem services. The three concept chapters provide the knowledge base of the subject: the general concept idea, nature as a concept and benefits as a concept. Nature types and concrete benefits are presented and used to suggest concepts and evaluation criteria for selecting the cases in the second part of the book. In the second part of the book, "Challenges and practices," we show which and how real-world practices with the aim of greening cities are currently being implemented around the world and from which ones we can learn. The case studies present those practices that demonstrate how the subject matter has clear practical dimensions and benefits for people, but also comes with potential challenges such as those related to planning or lacking scientific support. These are issues that still need to be overcome and from which the reader is invited to learn. The practical examples should show how not only researchers but also practical

planners are currently approaching the subject of the Green City. We have classified the examples based on four approaches.

Urban Agriculture—More Than Food Production

The implementation of urban agriculture as part of urban green development has gained increasing attention. Urban agriculture includes activities such as production, processing, delivery and marketing of agricultural products, and is an important service for urban residents. This can be implemented in urban and peri-urban areas. Urban agriculture as urban farming is an important income source, a possibility for urban gardeners to come into contact with nature again and to produce their own healthy food.

Urban Wild Land—Forests, Waters and Wetlands

Urban wildernesses are very diverse regarding the level of naturalness and management. The “old” wildernesses are the still remaining forests, waters and wetlands. They provide environmental and health benefits to urban residents and make cities more attractive. Urban waters are often the backbones of the urban green infrastructure.

Novel urban ecosystems like temporarily unused land, wastelands and less maintained areas, e.g., railway lines, canals, unused industrial extension sites, etc. are often not fully accepted as part of the urban green from which people can benefit. When these wildernesses are accessible and their benefits are explained to the people, they can provide not only functions for biodiversity protection, but also for nature experience and education.

Urban Protected Areas and Urban Biodiversity

The significance of biodiversity within city limits and in suburban areas has been globally recognized. Cities are hot spots of biodiversity. They offer species-rich and structurally rich habitats. Urban protected nature areas are often “protected islands” that are disconnected from each other and from other elements of the urban green infrastructure. This can result in a reduction of acceptance or even exclusion of city dwellers. Nature conservation activities in the city should aim at the preservation of urban nature and encourage the interaction and contact between people and nature in cities.

Multi-functional Urban Green Spaces

The final approach “Multi-functional urban green spaces” is a crucial pillar of the green infrastructure concept, as urban residents have multiple interests in profiting from different types of urban green spaces. Multi-functionality of urban green infrastructure can be linked to the ecosystem service approach. However, the combined ecological, social and economic functions often stand in contradiction to each other and cannot all be optimized in one area at the same time. It is necessary to define those services that are demanded and needed in the concrete spatial and socio-economic location to make the multi-functional approach feasible.

The book presents various case studies representing different planning pre-conditions, cultural backgrounds and spatial development possibilities from which we can learn. The examples of the various green city approaches show that there are multiple benefits to developing the Green City. The Green City can be considered a patchwork of activities using the existing conditions and nature of cities to let people benefit from urban nature.

Forty-nine authors from 18 countries from Europe, Asia and Latin America present selected studies that exemplify the practical implementation of the different approaches. Hence, it is possible to examine the adaptability of the concept of Green Cities in different natural and cultural environments, giving hope that these ideas will continue to spread and be implemented in the future. The broad range of perspectives on the Green City captured in this book could not have been possible without the support of many of our SURE members, whose collaboration and efforts have been indispensable for the completion of this book. We are especially thankful to Kristýna Kohoutková, Marc Giménez Maranges, Laura-Bethia Campbell and Elisabeth Höfler for their critical comments and to Jan Keily for language editing. It would not have been possible to publish this book without their great effort. Thanks to all of them!

Salzburg, Austria
Dresden, Germany
Bucharest, Romania
Berlin, Germany/Karachi, Pakistan
July 2019

Jürgen Breuste
Martina Artmann
Cristian Ioja
Salman Qureshi

Contents

1	The Green City: General Concept	1
	Jürgen Breuste	
2	The Urban Nature Concept—of What Urban Green Consists of	17
	Jürgen Breuste	
3	The Benefit Concept—How People Can Benefit from Urban Nature	49
	Jürgen Breuste	
4	Urban Agriculture—More Than Food Production	75
	Martina Artmann and Jürgen Breuste	
5	Urban Wildland—Forests, Waters and Wetlands	177
	Cristian Ioja and Salman Qureshi	
6	Urban Protected Areas and Urban Biodiversity	289
	Cristian Ioja and Jürgen Breuste	
7	Multi-functional Urban Green Spaces	399
	Jürgen Breuste and Martina Artmann	
	Index	527