

Greening China's Urban Governance

ARI – SPRINGER ASIA SERIES

Volume 7

Editors-in-Chief

Professor Jonathan Rigg

Associate Professor Huang Jianli, National University of Singapore

Cities Section

Section Editor: Professor Mike Douglass, National University of Singapore

Associate Editors

Professor Mee Kam Ng, Chinese University of Hong Kong

Professor Jeff Hou, University of Washington

Migration Section

Section Editor: Professor Brenda S. A. Yeoh, National University of Singapore

Associate Editors

Professor Richard Bedford, Auckland University of Technology

Professor Xiang Biao, Oxford University

Associate Professor Rachel Silvey, University of Toronto

Religion Section

Section Editor: Professor Kenneth Dean, National University of Singapore

Associate Editors

Dr Nico Kaptein, Leiden University

Professor Joanne Waghorne, Syracuse University

Dr R. Michael Feener, Oxford University

The Asia Research Institute (ARI) is a university-level research institute of the National University of Singapore (NUS). Its mission is to provide a world-class focus and resource for research on Asia. The three themes of the ARI-Springer Asia Series – Cities, Religion, and Migration – correspond to three of ARI's research clusters and primary research emphases. ARI's logo depicts rice grains in star-like formation. Rice has been the main staple food for many of Asia's peoples since the 15th century. It forms the basis of communal bonds, an element of ritual in many Asian societies, and a common cultural thread across nations and societies.

More information about this series at <http://www.springer.com/series/8425>

Jørgen Delman • Yuan Ren
Outi Luova • Mattias Burell
Oscar Almén
Editors

Greening China's Urban Governance

Tackling Environmental and Sustainability
Challenges

 Springer

Editors

Jørgen Delman
University of Copenhagen
Copenhagen, Denmark

Outi Luova
Centre for East Asian Studies
University of Turku
Turku, Etelä-Suomi, Finland

Oscar Almén
Uppsala University
Uppsala, Sweden

Yuan Ren
School of Social Development and Public
Policy
Fudan University
Shanghai, People's Republic of China

Mattias Burell
Hankuk University of Foreign Studies
Seoul, Korea (Republic of)

ISSN 2367-105X

ARI - Springer Asia Series

ISBN 978-981-13-0739-3

<https://doi.org/10.1007/978-981-13-0740-9>

ISSN 2367-1068 (electronic)

ISBN 978-981-13-0740-9 (eBook)

Library of Congress Control Number: 2018952470

© Springer Nature Singapore Pte Ltd. 2019

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, express 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 Singapore Pte Ltd. The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

Preface

This book examines China's emerging green urban governance. It is a result of work undertaken within the Sino-Nordic Urban Governance for Sustainable Cities Network (UGN). The aim of the Network has been to contribute new insights on the governance of China's green urban transition and to increase Nordic visibility and participation in China's urbanization, especially in relation to Shanghai and the Yangtze River Delta region. The researchers in the Network have primarily come from the universities involved with UGN, i.e. Uppsala University and Lund University in Sweden, the University of Copenhagen in Denmark, Turku University in Finland, and Fudan University and Zhejiang University in China.

The network members have conducted three research workshops so far. The first of these, entitled 'Urban Sustainable Governance and Citizen Participation and Action', was held at Zhejiang University in 2013. The second workshop was hosted at Fudan University in 2014 and combined with a PhD training course: 'Sustainable city development: Theories, methods, challenges, and experiences in China and the Nordic countries'. The final workshop, held in 2015 at the University of Copenhagen, focused on bringing together and discussing the papers for this volume under the theme: 'Governance for urban sustainability in China: Challenges and practices'. We would like to thank all the organizers of these workshops and of the PhD course for their dedicated efforts to make the workshops successful and to ensure the progress of our work.

Through the network's activities, researchers have been able to share their research results and insights, primarily from fresh empirical studies in China. But members of the Network have also found inputs from colleagues working on urban green governance in the Nordic countries helpful and relevant to discuss. Hailing from a variety of disciplines at the Nordic universities within the Network, their participation in our workshops was timely and fruitful. They allowed us to contextualize and theorize our results and to put the Chinese experience in perspective. We wish to express our gratitude to those colleagues for contributing their insights.

The chapters in this book speak to the dynamics of the ongoing development and transformation of the approach of the Chinese party state and of Chinese social actors to China's urban green governance and their respective roles in these pro-

cesses. The introduction, the theoretical contextualization by Dorthe Hedensted Lund (Chapter 1), and the individual chapters discuss a number of common themes: How can we work with governance theory in a Chinese context? What is the effect of China's rapid urbanization on urban green governance? What are the dynamics and evolutionary processes of China's emerging urban green governance regimes? How does institutional and cultural path dependency shape these emerging regimes? In which ways do economic and administrative reforms alter the picture? What are the theoretical and practical implications of the findings in relation to urban green governance in China and in a wider perspective?

Although some of the papers presented at the workshops have not been included here, they all helped to improve and to deepen our common knowledge and perspectives. We would especially like to thank the authors of the chapters in this volume for their efforts to introduce fresh ideas and insights, not least with regard to how city leaderships and other urban stakeholders in China are dealing with China's severe urban environmental challenges. We would also like to thank the *Nordic Centre at Fudan University* for its crucial role in facilitating network-building activities, as well as for its financial support. Thanks are due as well to *Nordic Institute of Asian Studies (NIAS)* and the *Fudan-European Centre for China Studies* at the University of Copenhagen for their financial support to the workshop in Copenhagen in 2015. A generous grant from the *Nordic Council of Ministers* in Copenhagen supported the activities of the Network from 2013 to 2015; this was crucial for making the venture possible and has been much appreciated.

Finally, we would like to thank Peter Mayers for his tireless, thoughtful, and exemplary proofreading of the draft manuscripts and Inger Helen Sørreime for her efficient editorial assistance during the final stages of processing this volume. We would also like to thank the many other student assistants who helped organize the workshops.

Jorgen Delman, Yuan Ren, Outi Luova, Mattias Burell, and Oscar Almén – organizers of UGN and editors of this volume

Contents

Part I Green Urban Governance – A Theoretical Perspective	
1 Wider Theoretical Debates on Urban Sustainability Governance	3
Dorthe Hedensted Lund	
Part II Policy Mobilization, Planning, and Implementation	
2 Are Model Cities an Effective Instrument for Urban Environmental Governance?	25
Stefan Brehm and Jesper Svensson	
3 Environmental Planning and “Multi-Planning Integration” in China	51
Jia He, Cunkuan Bao, Jun Zhu, and Jinnan Wang	
4 Environmental Policies Enter the Educational Sector: Different Shades of Green at District Level	67
Outi Luova	
5 Urban Water Management in Beijing and Copenhagen: Sustainability, Climate Resilience, and the Local Water Balance . . .	89
Li Liu, Marina Bergen Jensen, and Xiaoxin Zhang	
6 Direct Carbon Emissions by Urban Residents and Characteristics of High Emitters: The Case of Shanghai	107
Yuan Ren and Daisong Liu	
Part III The State’s New Tools of Green Urban Governance	
7 Digital Environmental Monitoring in Urban China	131
Jesper Schlæger and Jingjing Zhou	

8	Performance Reviews, Public Accountability, and Green Governance in Hangzhou	151
	Jørgen Delman	
Part IV Society Knocking on the Door		
9	Digital Media, Cycles of Contention, and Urban Governance in China: Anti-PX Protests as an Example of the Sustainability of Environmental Activism	177
	Jun Liu	
10	The Role of Social Protests in Environmental Governance in Hangzhou	195
	Mattias Burell and Oscar Almén	
11	Green Justice Approach to the Environmental Governance Dilemma: A Case Study of Jiufeng Environmental Energy Project in Yuhang District, Hangzhou	217
	Jiangli Wang, Youxing Lang, Feifan Huang, and Biao Wei	
12	Civic Engagement and Sustainable Development in Urban China: Policy Lobbying by Social Organizations	237
	Zhang Changdong	
	Epilogue: New Perspectives on China's Emerging Green Urban Governance	253
	Index	261

About the Authors

Oscar Almèn, PhD is a research fellow at the Department of Government, Uppsala University, where he teaches courses on development studies and methods. He obtained his PhD from the University of Gothenburg in 2005. His research focuses on political participation, political accountability, social movement, and state-civil society relations in China. He is one of the coordinators of the Sino-Nordic Urban Governance for Sustainable Cities Network (UGN). Recent publications include (2016) ‘Local Participatory Innovations and Experts as Political Entrepreneurs: The Case of China’s Democracy Consultants’, *Democratization*, 23:3, and (2013) ‘Only the Party Manages Cadres: Limit of Local People’s Congress Supervision and Reform in China’, *Journal of Contemporary China*, 80:1.

Cunkuan Bao works as a professor (doctoral advisor) in the Department of Environmental Sciences and Engineering in Fudan University. Prof Bao’s research focuses on strategic environmental assessment and environmental planning. His recent publications include ‘Designing a Management Framework for Strategic Environmental Assessment of Urban Plans in China’, *Journal of Environmental Assessment Policy and Management*; ‘Theoretical Framework of Environmental Planning Within the Context of Ecological Civilization’, *Journal of Fudan University (Natural Science)*; ‘Sustainability-Oriented Technical Standard System for Strategic Environmental Assessment: An analysis of the Effectiveness of the “Technical Guidelines for Plan EIA”’, *Journal of Urban Planning Forum* (in Chinese); and ‘PEIA Should Be Oriented by Value of Eco-civilization: From the Effectiveness Evaluation of PEIA on New-District Development’, *Journal of Environmental Economics*. Bao also published quite a lot of policy analysis in newspapers such as *China Environmental News* and *Jiefang Daily* in China.

Stefan Brehm, PhD is a research fellow at the Centre for East and South-East Asian Studies at Lund University in Sweden. He studied economics and Chinese at Eberhard Karls University in Tübingen, Germany, and Fu Jen Catholic University in Taipei, Taiwan. He received a diploma in international economics from Tübingen University in 2002 and was a PhD fellow at the postgraduate research programme

‘Global Challenges – Transnational and Transcultural Approaches’ from 2002 to 2005. He defended his PhD thesis on ‘China’s Integration into a Global Financial Order’ in 2005 (summa cum laude). The regional focus of his research is China, and his theoretical interest is concerned with new institutional economics and the political economy of regulation. Brehm covers a rather broad range of topics such as financial markets, public administration, and innovation. Currently he is member of a larger research group working on ‘Digital China’. In this context, Stefan looks at the role of data and data production for the distribution and redistribution of political power and economic wealth.

Mattias Burell, PhD is a research fellow and teacher at the Department of Government, Uppsala University. He is one of the coordinators of the Sino-Nordic Urban Governance for Sustainable Cities Network (UGN). Since his dissertation (2001), which examined the role of law in China’s labour market reforms, he pursued research projects on China’s housing market reforms, migrant workers, and citizen trust in government. In 2005, he conducted a major social survey in Wuhan. More recently, his research has focused on state-civil society relations, NGOs, and local environmental governance. His publications include ‘China’s Housing Provident Fund’ in *Housing Finance International* (2006) and the co-edited volume *Making Law Work: Chinese Laws in Context* (2011).

Jørgen Delman, PhD is professor of China Studies, Department of Cross-cultural and Regional Studies (ToRS), at the University of Copenhagen. His research examines state-society relations and political change in contemporary China. Currently, he focuses on China’s climate change politics, climate governance at city level, energy and energy security politics, and renewable energy. He is one of the coordinators of the Sino-Nordic Urban Governance for Sustainable Cities Network (UGN). His recent publications include the following: Guan, Ting and Jørgen Delman, ‘Energy Policy Design and China’s Local Climate Governance: Energy Efficiency and Renewable Energy Policies in Hangzhou’, *Journal of Chinese Governance*, 2017(1), pp. 1–23; ‘Urban Climate Change Politics in China: Fragmented Authoritarianism and Governance Innovations in Hangzhou’ (2016), Brødsgaard, K.E., and A. Mertha (eds.), *Chinese Politics as Fragmented Authoritarianism: Earthquakes, Energy and Environment*, Routledge; ‘From “Worn” to “Green” China Model? Energy in the 12th Five-Year Plan in an Environmental and Climate-Change Perspective’, Moe, Espen, Paul Midford (eds.) with Ole Odgaard (2014), *The Political Economy of Renewable Energy and Energy Security. Common Challenges and National Responses in Japan, China, and Northern Europe*, Palgrave Macmillan; (2014) ‘Climate Change Politics and Hangzhou’s Green City Making’, Björner, E., P.O. Berg (eds.), *Branding Chinese Mega-Cities: Policies, Practices, and Positioning*. Cheltenham, UK: Edgar Elgar Publishers; and ‘Fuels for the Future? The Emerging Architecture in China’s Liquid Biofuels Market’, Louis Augustin-Jean, Björn Alpermann (eds.), *The Political Economy of Agro-foods Markets in China. The Social Construction of the Markets in the Era of Globalization*, Palgrave Macmillan (with Yu Wang) (2014).

Jia He is a postdoc in the Department of Environmental Sciences and Engineering in Fudan University and has a major in environmental management and planning. She obtained her doctor's degree from the College of Environmental Science and Engineering at Tongji University. The title of her dissertation was 'The Value Preference of Strategic Environmental Impact in China'. Her recent publications in English include 'Experts' Perspective on the Performance of Chinese Technical Guidelines for Plan Environmental Impact Assessment' and 'Framework of Integration of Urban Planning, Strategic Environmental Assessment and Ecological Planning for Urban Sustainability Within the Context of China', *Journal of Environmental Impact Assessment Review*. His current research interests focus on public participation in SEA. The project is funded by the China's National Natural Science Fund Committee.

Feifan Huang is a PhD student at the Department of Political Science of Zhejiang University; she was an associate researcher at the College of Administration in Yuhang District, Hangzhou, from March to August 2015.

Marina Bergen Jensen, PhD works as a professor at the University of Copenhagen. She is heading the Landscape Technology Research Group at the Department of Geosciences and Natural Resource Management. Her research focuses on urban water management and the potential of nature-based solutions for improving the water balance in terms of both quantity and quality. She explores the conditions for a green transformation of existing infrastructures for water supply and wastewater management towards climate resilience and a reduced hydrological footprint. Her research includes the development of technologies for treatment of contaminated greywater and stormwater runoff and technologies for storage and infiltration of stormwater runoff by redesign of urban surfaces and furniture and by exploitation of geomorphological variation of urban soils. She has been heading numerous research projects and is currently supervising 10+ PhD students. Recent publications include 'Factors Affecting the Hydraulic Performance of Infiltration Based SUDS in clay', in *Urban Water Journal*, online August 2015; 'Green Infrastructure for Flood-Risk Management in Dar es Salaam and Copenhagen: Exploring the Potential for Transitions Towards Sustainable Urban Water Management', in *Water Policy*, 17:126–142, 2015; 'Land Cover in Single-Family Housing Areas and How It Correlates with Urban Form', in *Urban Ecosystems*, 18(4):1103–1123, 2015; and 'Towards Sustainable Urban Water Governance in Denmark: Collective Building of Capabilities in Local Authorities'. *International Journal of Innovation and Sustainable Development*, 10 (2):103–119, 2015.

Youxing Lang is professor and chair of political science at Zhejiang University. His recent publications include *Making Democracy Work: The Crafting and Manipulation of Chinese Village Democracy by Political Elites* (2009); *Political Aspiration and Political Inclusion: The Rich People's Participation in Zhejiang* (2012); and *Reform and Rural China* (2015).

Daisong Liu, PhD is candidate at Fudan University's Social Development and Public Policy School. His main research area is carbon consumption and sustainable development.

Jun Liu, PhD is an associate professor in the Department of Media, Cognition and Communication at the Centre for Communication and Computing, University of Copenhagen, Denmark. His research areas cover political communication, information and communication technologies, and political sociology. He has articles that have been published in the fields of political science, communication, and sociology, including *Mass Communication & Society*, *Social Movement Studies*, *Acta Sociologica*, and *Television & New Media*, among others. His research has won several awards, including the Best Dissertation Award, the Information Technology and Politics Section of American Political Science Association (2014), and the Best Paper Award, the 2014 International Communication Association Mobile Preconference.

Li Liu is an associate professor at the Department of Geoscience and Natural Resource Management, University of Copenhagen. After her earlier education at Beijing Forestry University, she got her master's degree in landscape architecture from Danish Royal Veterinary and Agricultural University and PhD (2008) from the University of Copenhagen. Her current research focuses on how to achieve sustainable and climate-resilient city, especially sustainable urban water management, by urban green infrastructure and nature-based solutions. Her research includes interdisciplinary investigation of cities' planning and design practices on green infrastructure-based urban water management for climate resilience and sustainability transition, reviewing and assessing the roles of green infrastructure in improving urban water balance and providing multiple benefits to cities, and investigating new knowledge and methods needed for improving planning and design of urban landscape for climate-resilient cities. Liu's recent publications include 'Climate Resilience Strategies of Beijing and Copenhagen and Their Links to Sustainability', *Water Policy* 19, 997–1013, 2017; 'Potential Contributions to Beijing's Water Supply from Reuse of Storm- and Greywater', *Journal of Southeast University (English Edition)*, 30: 150–157, 2014; and 'Multifunctional Green Infrastructure Planning to Promote Ecological Services in the City' by Niemela, J., Breuste, J.H., Guntenspergen, G., McIntyre, N.E., Elmquist, T., and James, P. (eds.), *Urban Ecology: Patterns, Processes, and Applications*, Oxford University Press, 2011.

Dorthe Hedensted Lund is senior researcher at the University of Copenhagen, Department of Geosciences and Natural Resource Management, Section for Landscape Architecture and Planning. Her main field of research is governance within the fields of urban and rural planning. In later years, she has mainly worked with the governance of climate change adaptation at municipal and city levels in Denmark as well as African cities. She is deeply involved in an action research

programme on Landscape Futures where the application of collaborative planning methods and strategy making is to improve rural landscapes and local development. She teaches a master's level course titled theories of urban governance and planning and performs numerous guest lectures in different contexts. Recent publications are Agger, A. and D.H. Lund (2017), 'Collaborative Innovation in the Public Sector – New Perspectives on the Role of Citizens', *Scandinavian Journal of Public Administration*, 21,3,17–37; Herslund, L., Lund, D.H., Jørgensen, G., Mguni, P., Kombe, W., and Yeshitela, K. (2015), 'Towards Climate Change Resilient Cities in Africa – Initiating Adaptation in Dar es Salaam and Addis Ababa'. Pauleit, S. et al. (eds.), *Urban Vulnerability and Climate Change in Africa*, Springer; Jørgensen, G., Herslund, L., Lund, D.H., Workneh, A., Kombe, W., and S. Gueye (2014), 'Climate Change Adaptation in Urban Planning in African Cities – The CLUVA-project', *Resilience and Sustainability in Relation to Natural Disasters: A Challenge for Future Cities*, P. Gasparini, G. Manfredi, and D. Asprone (eds.), Springer.

Outi Luova, PhD works as a university lecturer at the Centre for East Asian Studies at the University of Turku, Finland. She is vice director of the Centre and director of the Finnish University Network for Asian Studies. She holds an adjunct professorship (East Asian Studies) at the University of Helsinki and teaches frequently about sustainable urban development in Chinese universities. Her PhD thesis dealt with ethnicity-based economic cooperation between China's ethnic Korean areas and South Korea. Luova's current research focuses on China's urban governance especially with regard to environmental issues. Her recent publications include 'Community Volunteer Associations and the Diversification of Urban Governance in China: Comparison between Four Districts in Tianjin' [in Chinese] in *Societal Organizations and National Governance – Comparisons between China and Foreign Countries*, Peng Xizhe, Jude Howell, and Wang Chuanlan (eds.), Shanghai: Fudan University Press, 2016, and 'Charity Paradigm Change in Contemporary China: From Anti-socialist Activity to Civic Duty', *China Information*, 2017. She is one of the coordinators of the Sino-Nordic Urban Governance for Sustainable Cities Network (UGN).

Yuan Ren, PhD is professor of demography and urban studies in Fudan University, China. He is deputy director of the Institute of Population Research (IPR). He is fellow of New Century Excellent Talents awarded by Chinese National Education Commission (2012). He is one of the coordinators of the Sino-Nordic Urban Governance for Sustainable Cities Network (UGN). His recent publications include *Post-Demographic Transition* (Shanghai: 2016); *Reshaping Welfare Institutions in China and the Nordic Countries* (Helsinki & Shanghai: 2014); *Migration and Urbanization in Contemporary China* (Shanghai: 2013); and *Temporary Migrants' Living Patterns and Their Social Integration in Urban China* (Shanghai: 2012).

Jesper Schlæger, PhD is a distinguished professor in the School of Public Administration, Sichuan University. The chapter for this book was written during

his previous position in the Centre for East and South-East Asian Studies at Lund University. His main field of research is Chinese public administration, in particular e-government. He is the author of *E-Government in China: Technology, Power and Local Government Reform*, which includes a chapter on digital urban management. His articles are published in *Journal of Chinese Governance*, *China Information*, *Chinese Journal of Communication*, and *Policy & Internet*. He is faculty member on a professional degree (MPA) in urban operations and management and has developed and taught classes on municipal administration, urbanization in a globalized world, sustainable traffic, and social innovation. He has also contributed case-study materials on digital urban management to the Chinese national database for professional education.

Jesper Svensson is reading for a DPhil at the Smith School of Enterprise and the Environment, University of Oxford. He holds a Master of Science in Asian Studies from Lund University and two bachelor's degrees in political science and environmental science from School of Business, Economics, and Law at the University of Gothenburg. Prior to joining the University of Oxford, Jesper worked as a research assistant for the Transboundary Rivers and Adaptation to Climate Extremes in North America (TRACE, North America) project under Dr Dustin Evan Garrick. He is currently the senior editor for Global Water Forum.

Jinnan Wang works as a vice director of Chinese Academy for Environmental Planning. Wang is also titled as the director of key laboratory of national environmental planning and policy simulation. Wang's research focus on environmental planning and policy. Wang has published 15 books and hundreds of journal articles. Wang's current publications include *Environmental Planning: Theory and Methodology*, Chinese Environmental Press (2014); 'The Challenge and Countermeasure for Developing Environmental Think Tanks in China', *Journal Environmental Protection* (in Chinese); and 'The Environmental Function Assessment and Zoning Scheme in China', *Acta Ecologica Sinica* (in Chinese).

Jiangli Wang, PhD is associate professor of international politics in the Department of Political Science, College of Public Affairs at Zhejiang University in Hangzhou, China. She is also a researcher at Zhejiang University's Center for Non-Traditional Security and Peaceful Development Studies. Her recent publications include 'The English and Chinese Schools of International Relations: Comparisons and Lessons' (with Barry Buzan, 2014); 'The Historical Turn of Contemporary IR Study in China' (2013); and 'Green Justice: Possibility and Necessity of Global Green Governance' (2012).

Biao Wei is senior engineer and certified planner of Hangzhou City Planning and Design Academy. His recent publications include Terry (2009), *Liverpool: Regeneration of a City Centre* (Taylor, David, and Davenport), translated by Wei

Biao (2016); ‘Analysis and Implications of Public Participation in Urban Planning in China and UK: Case Studies of Hangzhou and London from a Comparative Perspective’ (with Dai Zhemin, 2015); and ‘High-Speed Rail and Urban Transformation in China: The Case of Hangzhou East Rail Station’ (with Chen, Chia-lin, 2013).

Changdong Zhang is an associate professor of political science at the School of Government and a research fellow of the Institute of State Governance and Center for Civil Society Studies, at Peking University. He received his PhD in political science from the University of Washington, Seattle. Zhang Changdong’s research interests include comparative authoritarianism, taxation politics/fiscal sociology, state and society relationships, and institutionalism, with a regional focus of China and Asia. Prof Zhang has published about 20 journal articles (including *China Review*, *Sociological Theory*, and *Non-Profit and Voluntary Sector Quarterly*) and book chapters both in Chinese and English.

Xiaoxin Zhang works as a professorate senior engineer at Beijing Municipal Institute of City Planning (BMICP). He is director of Department of Municipal Plan at BMICP. His current research focuses on stormwater management, urban flooding control, and sustainable water resources management. He has completed more than 20 projects funded by Beijing Municipal Government. Recently he is the team leader of the Local Flooding Control Plan in Beijing Central Area. In this project, the project team set up a 2D hydraulic model and finished the flood map for Beijing Central Area. Zhang’s recent publications include ‘Overview of Urban Stormwater Runoff Management in USA’, *Journal of Water & Wastewater Engineering China*, 2014:40, and ‘Strategy of Local Flooding Control in Beijing Central Area’, *Journal of Beijing Planning Review*, 2012:05.

Jingjing Zhou,LLM is a lecturer in the Department of Politics, Sichuan University Jinjiang College. She has undertaken extensive research on e-government and smart city development, as well as translation of academic literature. She has recently participated in writing a national-level textbook on e-government.

Jun Zhu works as research professor in the Research Centre of Ecological and Environmental Strategy in the Urban Planning and Architectural Institute of Fudan University. His research focuses on ecological planning, environmental planning, and strategic environmental assessment. His current research projects include ‘Urban comprehensive traffic plan environmental impact assessment’, supported by the Ministry of Environmental Protection, and ‘The technology to ensure ecological security in the City group of Yangtze River Delta’, supported by the Ministry of Science and Technology.

Abbreviations

AECRU	Association of Energy Conservation and Resource Utilization
BWA	Beijing Water Authority
CAP	Copenhagen Climate Adaptation Plan
CBD	Central Business Districts
CCSS	Center for Civil Society Studies of Peking University
CCTV	China Central Television
CDR	Committee of Development and Reform
CEMS	Continuous Emission-Monitoring Systems
CMP	Cloudburst Management Plan
CNNIC	China Internet Network Information Center
COD	Chemical Oxygen Demand
CPC	Communist Party of China
CSO	Combined sewer overflow
DRC	Development and Reform Commission
EB	Education Bureau
EIA	Environmental Impact Assessment
EIC	Economic and Information Commission
ENGO	Environmental non-governmental organization
EPB	Environmental Protection Bureau
EU	European Union
FYP	Five-Year Plan
GDP	Gross Domestic Product
GHV	Green Home Volunteers
GI	Green Infrastructure
GONGO	Government-owned/organized NGO
HOA	Homeowners Association
HOFOR	Greater Copenhagen Utility
ICT	Information and communication technology
IQR	Inter-Quartile Range
JEEP	Jiufeng Environmental Energy Project of Yuhang in Hangzhou (earlier called the Jiufeng Waste Incineration Power Plant Project)

KEPC	Key environmental-protection cities
KPI	Key Performance Indicators
LID	Low Impact Development
MEP	Ministry of Environmental Protection
MoHURD	Ministry of Housing and Urban-Rural Development
NDRC	National Development and Reform Commission
NESDP	National Economic and Social Development Plan
NG	Network Governance
NGO	Non-governmental organization
NIMBY	Not In My Backyard. It is usually used to describe the opposition by residents against building a potentially harmful facility near them.
NLGCC	National Leading Group on Climate Change
NMCEP	National Model City for Environmental Protection
NPG	New public governance
NPM	New public management
PES	Payments for ecosystem services
PITI	Pollution-Information Transparency Index
PX	Paraxylene
QESCCUE	Quantitative Examination System on Comprehensive Control of the Urban Environment
RCE	Residential energy consumption-related carbon emissions
RFD	Residents-factory dialogue platform
RMB	Renminbi
SARS	Severe acute respiratory syndrome
SDC	Sino-Danish Center for Education and Research
SEPA	State Environmental Protection Agency
SWOT analysis	Strengths-Weaknesses, Opportunities-Threats
TCE	Transportation-related carbon emission
TPA	Traditional public administration
TPM	Traditional public management
URDCE	Urban residents' direct carbon emission
US	United States of America
WTE	Waste to energy

Introduction: Getting to Grips with China's Emerging Green Urban Governance

This volume focuses on how governments and social stakeholders in urban China engage with major environmental risks and how they tackle the governance of the long-overdue transition to greener, more livable, and more sustainable cities. We draw inspiration in this endeavour from Henri Lefebvre's observation on the importance of the ecological question:

...it is correct to assert that the milieu of life and the quality of the environment have acquired an urgent, politically central status. Inasmuch as one accepts such an analysis, the prospects for action are profoundly reformed. Several well-known but somewhat neglected forms—such as associative life or grassroots democracy (*autogestion*)—must be reinstated as key priorities; they assume new meanings when applied to the urban. The question then is to know if social and political action can be formulated and rearticulated in relation to specific problems, that, even if they are concrete, concern all dimensions of life. (Lefebvre 2014/1989)

The contributors to this volume argue that challenges to China's environmental and ecological sustainability in conjunction with popular demands for a higher quality of urban life have made a green turn in China's urban development necessary and that this need has already attained a central political status. In consequence, the prospects for political action have been transformed in recent years, and the Chinese Party-state has been forced to reformulate its approach to urban governance. Rapid demographic growth, massive industrialization, dramatic urbanization, and severe environmental degradation—with their devastating consequences—are the primary factors driving these developments. For many in China, however, the political, economic, social, and ecological inequality caused by these processes are of equally great concern. The changes in the political winds, as well as the newfound resolutions to tackle these challenges at the city level, are reflected in what we call emerging urban 'green' governance regimes. In this context, many of the authors in this volume have a special focus on the role of what Lefebvre called *autogestion* in the quotation above, i.e. on popular action and participation as a new driver in the green turn in urban governance in China.

The concept 'green' does not come with an established scientific or normative definition; nor have the authors of this volume attempted to arrive at one. But the

general assumption underlying China's urban green politics is reflected in the idea that economic growth, which is still a top national priority, must be achieved in an environmentally sustainable manner, i.e. it must not come at the expense of the environment (Fay et al. 2014).

As a development principle, sustainable development was raised in *Our Common Future*, by the World Commission on Environment and Development (World Commission 1987), and affirmed by the UN General Assembly in 1987 (United Nations 1987). In October 2015, the UN General Assembly (United Nations 2015) drew up a new working agenda for sustainable development over the next 15 years. As cities are core intervention arenas when it comes to sustainable development in any society, sustainable cities or sustainable urban development has also become prominent on both national and local policy agendas in China (Qiu 2006). Related concepts and programmatic approaches (eco-city, low-carbon city, green city, livable city, and sustainable city) have been widely discussed and experimented with in practice over the last three decades (Delman 2014). However, while the Chinese leadership has thus embarked on a course to improve China's environment, and not least its urban environment, the pursuit of economic growth still has a negative environmental impact.

China's leaders have repeated and refined their vision of a greener country in a great number of political programmes in recent years. A particularly comprehensive development programme from 2015 called for the promotion of eco-civilization (*shengtai wenming* 生态文明) across the Chinese territory. As a national strategy for sustainable development, improved environmental management, and a new green governance regime, eco-civilization presents new values and norms for China's green transition. The principles of eco-sustainability are to be rooted in people's lifestyles, in the processes of industrial production, in the mechanisms of sociopolitical interaction, and in the methods and structures of urban development and governance. Moreover, Chinese leaders anticipate further institutional reforms in connection with environmental property institutions, market-based resource pricing, mechanisms for effective ecological compensation, and sanctions against non-compliers (Zhonggong Zhongyang 2015; Xinhua News Agency 2013; Hu 2012). These points were re-emphasized by Xi Jinping in his authoritative report to the 19th Communist Party of China Congress in October 2017 (Xi 2017).

Many cities in China developed their own approach to eco-civilization before it was fully developed as a national policy. In 2009, for example, Hangzhou¹ was chosen as an experimental site for urban eco-civilization by the Ministry of Environmental Protection. This was due to the city's considerable experience with a series of pilot environment and ecological development programmes since 1999. The main goal of Hangzhou's 10-year eco-civilization programme (2010–2020) is to develop and implement a morally informed new approach to comprehensive sustainable development, thereby ensuring continued economic growth while making the city more livable through a transition to greener production, transport, and daily life (Delman, Chap. 8; Delman 2016b; Delman 2014).

¹Three chapters in this volume deal specifically with Hangzhou: Delman, Chap. 8, Burell and Almén, Chap. 10, and Wang et al. Chap. 11.

In China, as in other countries, these developments are taking place against the disturbing backdrop that the existing model of development has proven unsustainable (Kassiola and Guo 2010). China suffers from severe environmental degradation and from an increasing bio-capacity deficit. The country's per-capita ecological footprint—i.e. the demands put on its renewable resources—has far exceeded its ability to regenerate these resources. The size of the footprint is now 2.5 times that of the country's bio-capacity. The fastest growing individual component of China's ecological footprint is its carbon footprint, stemming from the use of fossil fuels in the economy at large, from the use of electricity by households, and from the consumption of carbon embodied in products for private, public, or commercial consumption (China Ecological 2012, 7–25). China's major cities now have larger per-capita carbon footprints than other major cities around the world (Baemler et al. 2012, xlii; see also Ren and Liu, Chap. 6). These ecological and environmental problems do not just pose an important challenge to China's long-term development. Given the size of the country's population and the size and expected expansion of its economy, they also have a severe impact on global ecology and on the future sustainability of our planet.

The Chinese leadership's commitment to leading China through a green transition is reflected in a series of major policy documents, most recently in the 13th 5-year plan (Lianghui 2016), which covers the 2016–2020 period, as well as in recent urban development strategies (Zhonggong Zhongyang 2016; Guojia 2014). These policies aim to address the needs and the consequences of the fast and profound urbanization process that China has experienced since the 1980s. The rate of urbanization is already above 50%. The new policies also document that China's leadership is paying increasing attention to the well-being of the Chinese people. In fact, well-being has become one of the important targets of urbanization. China's most recent urbanization strategy from 2014, called 'new urbanization' (*xin chengzhenhua* 新型城镇化), depicts a new pattern of urbanization that emphasizes urban/rural integration, people-centred development, improving migrants' status as citizens, social integration, and environmental and ecological improvement (Guojia 2014). These ideas have now become basic guiding principles in China's urbanization and urban governance.

Most of China's cities have formulated a set of green policies like Hangzhou's; however, various local interests and stakeholders frequently delay or derail the process, preserving the status quo as much as possible in defence of their interests. They do not necessarily see any need to hurry; nor do they have the right incentives to change their behaviour (Kostka 2014; Ran 2013; Delman, Chap. 8). At the same time, many citizens seem impatient, and they are actively demanding improvements in the environment (J. Liu, Chap. 9; Burell and Almén, Chap. 10; Wang et al., Chap. 11; Zhang, Chap. 12).

It is thus timely and important to take the reader to the urban battlefronts, where the main fight to regain China's ecological balance is being waged. As Lund² notes

²Lund is the only contributor to this volume who has not worked with China. We have sought her contribution in order to develop a framework of commonly applicable theoretical concepts that can be used for reflecting on the findings of the case studies.

in her theoretical contribution on sustainability governance (Chap. 1), the conditions for human and non-human life are changing rapidly, and urban areas now have a dominant impact on global and local ecosystems. Cities increasingly embrace material flows, human activities, and governance structures that link them in complicated patterns both with their immediate surroundings and with global networks in which the challenges to and the conditions for effective governance are increasingly complex. Policy issues have become more intricate, and an increasing number of actors are gaining influence through global and local initiatives. As in urban zones elsewhere, great amounts of energy, food, materials, water, and land are consumed in China's urban areas, and huge volumes of waste, air pollutants, CO₂, and other greenhouse gases are produced there. As the nexus for economic growth, innovation, and employment in the national economy, urban areas necessarily and continuously develop new forms of governance to promote green and sustainable development.

As we see it, then, the urban green politics and action seen in China today have profound consequences for the future of China and of our planet itself. However, as J.L. Wang et al. point out in Chap. 11, there is also a need to take a step back—to consider justice in connection with these developments, i.e. principles that will lead to a fairer distribution of public environmental goods and a reduction or elimination of public bads. In Chap. 11, the authors argue that the earth's environment is an integral whole and that we cannot merely protect our own backyards. With the deepening ecological crisis, human beings need to reflect on their common history and their present predicament. It is time for a change of lifestyle and methods of production and to embrace a more holistic view of green justice. Humans, they state, must recalibrate their relationship with nature, with society, and with themselves. We are far from there as yet, however, and it is exactly the dynamics of China's green urban transition that have brought the contributors to this volume together.

The Purpose of This Volume

All the contributors here are interested in how China's environmental and sustainability challenges contribute to the transformation of urban governance and urban environments in China and how institutional reform, path dependency, and deepening globalization influence China's emerging urban green governance. The chapter authors examine the fight in China's cities *against* environmental degradation and *for* green change. While anchoring their studies empirically in the contemporary urban settings of the country, they contextualize their cases in theoretical, historical, institutional, and practical terms. They discuss whether and how new forms of urban green governance can help make China's cities greener, more sustainable, and more livable. Given the new Chinese framework for urban eco-civilization, the chapters also speak to international debates about ecological urbanism 'as a means of providing a set of sensibilities and practices that can help enhance our approaches to urban development', through the utilization of 'a multiplicity of old and new methods,

tools, and techniques in a cross-disciplinary and collaborative approach toward urbanism developed through the lens of ecology' as noted by Mostafavi (2010).

Most of the chapters are based on fresh case studies that examine China's urban green governance from the inside out. All of them ask what deteriorating global and local environments do to China's system of urban governance, especially after national and local authorities in the country have realized that these challenges have to be dealt with decisively. Finally, the authors apply critical perspectives from the Chinese case to current international debates about urban governance in the face of the eco-sustainability challenges associated with urbanization.

Planet China and Urbanization Under Global Capitalism

China's urbanization over the last four decades has been rapid, dynamic, and environmentally devastating. The proportion of the population living in urban areas rose from around 20% in the 1980s to 56.1% in 2015. This means that about 770 million people lived in urban areas in the early 2010s, while about 600 million lived in rural ones. This trend is expected to continue during the coming decades, so that one billion of China's 1.4 billion people will be urban dwellers by 2050 (Ohshita et al. 2012). Such rapid urbanization poses huge environmental, ecological, and social challenges. Industrialization, the development of the nonagricultural economy, and urbanization are the driving forces behind it, and it is accompanied by accelerating changes in lifestyle and consumerism. In their study of carbon emissions by households in Shanghai, Y. Ren and D.S. Liu (Chap. 6) find that, although carbon emissions in China are still mainly caused by industrial production, the trend of development in China's cities is the same as that seen within cities in more developed countries. Large cities like Shanghai and Beijing are already well on their way to having an economy driven by services and consumption, and they will be the first to show how consumption is emerging as the main cause of overall carbon emissions in urban areas. Ren and Liu also find that different population groups are unequal in their direct carbon emissions. High emitters constitute 15.1% of the total population; however, their direct carbon emissions already account for 37% of overall carbon emissions. Low emitters, on the other hand, make up about 14% of the total population, but they produce only 4.4% of overall carbon emissions. In fact, the level of carbon emissions can already be regarded as an indicator of residents' socioeconomic status.

Of course, China's cities are comparable to cities around the world on a lot of different parameters. But as a relatively isolated political unit—first as the Chinese empire, subsequently as the Republic of China, and then as the People's Republic of China—China was in many ways a planet unto its own until it opened up to the outside world in earnest in the 1970s. This was due to the size of its territory, of its population, and of its economy; its long cultural and political history as a largely coherent, yet at times dramatically expanding political unit; its uniquely unifying language, which acts as an essential cultural glue; and its long history of large-scale

urban settlements. However, China's most recent wave of modernization and reform, which has washed over the country since 1978, together with its interaction with a globalizing world, has thrust the country on to the global scene in ways that nobody had been able to predict, with the economic historian Mark Elvin as the eminent exception (Elvin 1973, 319).

Over the last half century, China has moved from being the empire at the centre of the Sinic world to becoming a powerful nation *inter pares*. Within the area of urban development and management, China basically followed its own practices until the late nineteenth century. In Elvin's words, the form of Chinese cities and the methods of their management, which had emerged over the course of more than two thousand years, marked '...[a] new civilization. The creation of the city began a crucial decoupling between the dominant, decision-making, part of the population, now living increasingly in a built environment, and the rest of the natural world. In other words, where and when a decision was made coincided less and less with where and when its environmental impact was felt...Increasing [decisional distance—*authors*] has progressively lessened the awareness of and sensitivity to the environmental effects of their policies among rulers and their advisers. This still holds today' (Elvin 2004, 94).

China's cities have always been large by the standards of their era. As the country evolved under its ruling dynasties, its systems for urban planning and management became more complex and sophisticated, in line with the changes taking place in each period. They also became more varied in their principles and approaches, but the urban hierarchy of rank and size dating back to imperial times still continues to matter today (Wu and Gaubatz 2013: 44, 49).

Against this backdrop, the term 'urban planning and management' is used here to signify the specific Chinese tradition under which cities were seen as political and military nodes in a thinly spread, hierarchical, and (mostly) effective imperial system of government that was developed in order to exploit and control the country's huge territory, its people, its resources, and its economic flows. The pattern whereby urban areas absorbed resources from rural society and control the national economy was strengthened during the period of the socialist planned economy, from the 1950s to the 1970s. This approach led to a rigid urban/rural binary structure, the legacy of which is still evident today, for example, through the particular type of Chinese urban residence registration (*hukou* 户口), which has privileged urban residents and made it very difficult for rural residents to obtain urban residence (i.e. full urban citizenship) since the 1950s. From the early 1980s, however, rural residents have been allowed to migrate to the cities in ever greater numbers to find jobs as 'peasant workers' (*nongmingong* 农民工). Still, these migrants with rural *hukou* largely remain second-class citizens—only now in the cities. Binary or segregated urban/rural systems of public finance and social management still exist, and the urban/rural binary continues to generate risks for urban governance in connection with resource management, inequitable development, and control over property (Yu et al. 2014). Effectively, only 35.3% of the total urban population had a local *hukou* registration in 2012, while 52.6% of the country's population lived in cities (Guojia 2014). The strong historical focus on privileged urban-centric development has

never ceased, and the use of distinct approaches to political control founded on urban and urban/rural hierarchies has never been abandoned. As a result, in the view of Yao (2011), China's accelerated urbanization over the last few decades has 'resulted in extensive damage to its agricultural community, even leaving little time for adjustment. This seemingly irresistible force of modernization and urbanization is accelerating with an endless propelling, penetrating and destroying ability'.

Given the huge area of the country, more than twice that of the current European Union, there are considerable regional differences in styles of governance within China. However, under the hierarchical party-state system (on which more below), China's cities remain under the jurisdiction of higher levels of government. Still, urban planners, managers, and developers have naturally been forced to fit their ideas and governance patterns to local situations as local circumstances change. Since 1949, moreover, through policy transfers (cf. Peck and Theodore 2010), China's urban planners have liberally utilized ideas, experiences, and inputs from elsewhere—first from the Soviet Union and later from the West—in order to develop and modernize China's cities. They have done so to such an extent that Chinese urban leaders, according to Hsing You-tien, have now dropped industrialization as a distinctive marker for their efforts and replaced it with urban ideals. Not only have they adopted the jargon of 'city branding', 'urban marketing', and 'global cities', but they have also embarked on standard urban projects like the grand redevelopment of inner-city districts and the creation of central business districts (CBD) equipped with the infrastructure and services needed by head offices of large national and multinational corporations (Hsing 2010, 18–19). Over the last two decades, many of these iconic projects have been designed by world-class architects, some of them Chinese, and they are already textbook examples of urban projects. These developments testify to the openness of urban planners and developers in China; however, some claim that China has learnt little, if anything, from the negative experiences of the West during its urbanization (Bosker 2014). Indeed, 'weird' buildings are now being criticized and disallowed by the Chinese leadership (Rivers and Chung 2016). They are also often ridiculed by residents. The new China Central Television (CCTV) tower in Beijing, for example, has been nicknamed 'big pants' (*dakuzi* 大裤子) by locals.

As in other Asian countries, urban modernization and transformation in China embrace three historical processes. Taking place concurrently, but with diverse impacts at different times, they are globalization, urbanization, and the building of a modern nation-state. While globalization varies in its impact across Asia, it has prompted a liberalization of Asian economies and an embrace of various forms of capitalism (McKinnon 2011, 7–11). China's new 'socialist market economy' has been termed state or authoritarian capitalism (Witt and Redding 2012), inasmuch as it continues to be dominated for the most part by a hierarchical party-state system (described below) and by state-owned enterprises. It involves a particular variant of neoliberalism—one combining strong intervention by the local state with a radical market orientation. At the same time, the local state in China is highly entrepreneurial: it has used its privileged access to land to conduct lucrative land transactions, to promote the local generation of wealth, and to maintain its authoritarian rule. Local

institutions have been changing rapidly to accommodate these processes, all within a context which was largely nondemocratic and mostly lacking in the rule of law. Finally (and somewhat paradoxically), local authorities have been increasingly endowed with powers, mandates, and assets, due to the wish of the central leadership to decentralize authority and power (Lin et al. 2014).

China's transformation from a traditional agricultural society into a modern industrialized one has brought about phenomenal changes in spatial terms, with a dramatic increase in the number of cities. In 2016, China had 626 cities, of which around 100 had more than 1 million inhabitants. The national and the local state has been at the core of this urbanization process: not only has it led it, but it has also formed an integral part of it. The local state has mobilized its resources to expand and strengthen cities, and the struggle over resources—their accumulation, their enjoyment, and their deployment to overcome barriers to urbanization—has come to define the local state and resulted in its consolidation. At the same time, urban expansion has created much larger urban regions, calling forth territorial dynamics which have provoked intrastate and territorial competition, and enabled the expansion and scaling of state power (Hsing 2010, 7–19).

Capitalism in Asia, including its authoritarian variant in China, has produced new levels of education, new kinds of occupation, and new opportunities for private space—not least for the new middle classes (McKinnon 2011; Ren and Liu, Chap. 6). Forces of individualization demand new arrangements for work, living, and transportation and lead to the contestation and reformulation of public and private norms and values (McKinnon 2011; Yan 2010). It is clearly necessary to study the confluence of all of these factors and processes when examining the challenges to urban sustainability in China, as the authors in this volume acknowledge and do in different ways.

For China's urban authorities, then, it has now become a concern to make the nation's cities more pleasant and viable to live and to work in. They have therefore engaged with academia to use modern environmental science in planning, governing, and managing urban processes and cities. At the same time, they have come to recognize that new methods of government are required if the challenges that cities face are to be addressed. Among these methods, the institutionalized participation of citizens and other societal stakeholders in policy development, in co-governing, in overseeing the government, and in conducting urban planning and decision-making have become prominent, not only outside China (cf. Lund, Chap. 1) but also to some extent within China. This is amply reflected in the strategies for urban development decided most recently by Chinese leaders (Zhonggong Zhongyang 2016; Guojia 2014). Furthermore, urban elite actors are increasingly inspired from outside through academic exchanges, study visits, and official programmes like city-to-city collaboration (Delman 2016a) which lead to new types of policy mobilization (cf. Peck and Theodore 2010) around China.

China's political and administrative authorities are indeed struggling today to tackle questions that have been debated in the academic literature for years (see Peck 2015): What, for example, is a city? Does 'the city' exist? Are current territo-

rial and administrative borders and demarcations useful for dealing with the consequences of urban development and urban processes? How can multiple stakeholder interests be taken into account in urban development? How should broad coalitions and alliances for qualitative change—such as a green transition—be structured and built so as to facilitate not only policy development but also sustainable day-to-day management of environmental challenges, such as traffic congestion or the handling of garbage?

The Rulers on the Ground: China's Party-State System

The authors contributing to this volume hail from different disciplinary backgrounds, mainly in the social sciences and in urban studies. They are quite familiar with China's urban institutional environment and how it is governed. We recognize, however, that some readers may need guidance to fathom the political and institutional framework with which the authors are working academically and on the ground and to which they liberally refer. We shall therefore give a brief account of how China and Chinese cities are governed.

After the Communist Party of China (CPC) took power in 1949, it started to build a political system with parallel party and administrative branches. The Soviet Union served as the model in this regard, while China's imperial experience and the CPC's own experience with governing revolutionary base areas were also seen as crucial. The system that emerged operated with corresponding party and state organs that took responsibility for similar issues or sectors at all administrative levels: central, province/provincial city, prefecture/city, county/county city, and township. It is a hierarchical system in which the CPC maintains overall political, ideological, and administrative leadership and control over governments at all administrative levels, as well as over the people's congresses that elect them formally. As a consequence, the next highest level of party-state administration supervises and controls key political and administrative processes at the level immediately below.

For a long time, the party-state system was a world unto itself with no direct civil or societal constituency. It was largely driven by bureaucratic politics. The horizontal levels of party-state system at different administrative levels are known as 'areas' (*kuai* 块), i.e. territorial units of government; the vertical bureaucracies linked to ministries in Beijing are known as 'lines' (*tiao* 条), and they operate at all territorial administrative levels within nation-wide systems (*xitong* 系统) with shared mandates and identity. But the complex hierarchical nature and the often partisan political interests of the constituent horizontal and vertical parts of the party-state system produce internal fragmentation and competition both horizontally and from top to bottom—between different sectors, between administrative levels, between vertical bureaucracies, and at times between party and state (Lieberthal and Oxenberg 1988; Brødsgaard 2016). Since the CPC has insisted on maintaining the basic structure of

the parallel political-administrative system until now, political scientists use the term 'party-state' as shorthand for the conjoined systems of the party and the government.

From the outset in 1949, the party-state leadership recognized the need to mobilize, manage, and control the broader population. It established a number of so-called mass organizations for the purpose, such as trade unions, a women's federation, a communist youth league, and professional or trade associations—one for each sector. These bodies continue to exist, but the CPC has also come to accept that—with liberalization of the economy and society—more channels need to be opened up for representation by increasingly variegated and sophisticated social groups (see Burell and Almén, Chap. 10; Wang et al., Chap. 11), who have become well versed in using different channels, including the social media, to promote their interests (cf. Schlæger and Zhou, Chap. 7; J. Liu, Chap. 9). Over time, the CPC has proven itself to be adaptable vis-à-vis societal demands, and its flexibility allows it to continue governing. This modality of government has been called 'consultative authoritarianism' (He and Thøgersen 2010).

The CPC is a popular party and its membership continues to grow. In 2017, the Party had about 89.5 million members (China Daily 2017), i.e. about 6.6% of the entire population or some 8% of the population eligible for membership. While the CPC does not claim its mandate from direct elections, it does however assert its popular support based on the feedback it receives through its huge membership, through mass organizations, through organs of the party-state system, and more recently through social organizations and social media. Under the consultative authoritarian arrangement, social organizations have been able to gain some measure of operational autonomy (cf. Zhang, Chap. 12). Furthermore, as the channels of interaction between social organizations and the state have opened up, social actors and organizations have exploited new opportunities to impact policy-making (Teets 2014). But the CPC continues to insist on its right to co-opt social organizations, primarily to be able to control them, like it does in relation to all media and state-owned enterprises. Several authors in this volume explore the dynamics of the increasing interaction, tension, and/or collaboration between the party-state and societal interests and the consequences thereof for green urban governance (cf. Schlæger and Zhou, Chap. 7; Delman, Chap. 8; J. Liu, Chap. 9; Burell and Almén, Chap. 10; Wang et al., Chap. 11).

Despite its hierarchical organization and its internal fragmentation, the party-state has proved to be a dynamic political-administrative organization. Combined with the decentralization of decision-making powers to lower levels of administration—not least the provinces and the big municipalities—these dynamics have opened up space for wide-ranging local experiments, for varying speeds of reform at the regional level (Heilmann 2007, 2008), and for openness in many cities to establishing a dialogue and even collaboration with external stakeholders to address local issues, as several of the contributors to this volume document (Delman, Chap. 8; J. Liu, Chap. 9; Burrell and Almén, Chap. 10; Wang et al., Chap. 11; Zhang, Chap. 12).

In order to mitigate fragmentation and internal competition, which can be both productive and disruptive, the party-state has developed a number of sophisticated integrative mechanisms over time (Lieberthal and Oxenberg 1988). These aim to deal with increasingly complex political challenges. Among them, leading groups have become important. They cut across and combine the often contradictory interests of the various party and state organs to make them collaborate to ensure more effective policy implementation. They have thus become increasingly important for addressing complex or thorny policy issues (Miller 2008), such as environmental degradation, eco-civilization, and climate change. These issues involve coordination between a host of bureaucracies, and they demand the active participation of civil society, businesses, and citizens if solutions are to be found and implemented (Delman, Chap. 8; Delman 2016b).

The party-state system is highly meritocratic in its recruitment practices and in its approach to human resource development, with a strong focus on the careers of individual party-state leaders. The system is exceedingly professionalized and technocratized in the execution of its mandates. City officials are sufficiently well-educated to interact productively with experts in academia, society, and the business sector and to apply up-to-date national and international research and science in their work (Mol and Carter 2006).

The complexity of the party-state system and the absence of independent supervision and control of it have however resulted in widespread abuse of power and corruption. The problem is made yet worse by the continued dearth of transparency in the execution of government (cf. Wang et al., Chap. 11). This has given rise to far-reaching popular dissatisfaction and widespread distrust of party-state bodies. The current high-profile campaign against corruption under Xi Jinping's leadership is clearly meant not only to restore proper morals and behaviour within the party-state administration but also to garner new legitimacy for the CPC as the ruling party (Hewitt 2015).

Fundamental political reforms are not currently on the drawing board, but as noted above the party-state has proven agile and able to adapt to new circumstances. It has done so through continuous administrative reforms and through development of its consultative mechanisms. This is also the case within urban green governance, which has become an increasingly important political arena for the local party-state after many years of negligence. As this volume demonstrates, a shift is taking place from uniform top-down government to a more versatile form of governance, which combines traditional public administration, new public management, and network governance in a variety of ways (cf. Lund, Chap. 1). But it does not put the power monopoly of the party-state at risk. In fact, we would stress that the emerging urban green governance regimes are deeply influenced by the party-state system, and it will continue to exert a critical influence at all levels of operation on China's green development in the years to come.

China's Green Urban Governance and the Theoretical Landscape

Since the open-door policy was initiated in 1978, China's cities have been reconstructed and reinvented, in order to engage with modernization needs and globalization. The dynamics, trajectories, and systematics of this development are based significantly on a negotiation between the national heritage, the socialist practice, and the international experience, with the latter being absorbed into local urban design, planning, and management (cf. Peck and Theodore 2010; Peck 2015). This negotiation has been expressed through new urban and architectural designs (as noted above); through the establishment of special economic zones, export-processing zones, financial centres, central business districts, eco-cities, and similar models on the one hand; and through the incorporation of large numbers of rural migrants, not only as workers in industry, construction, and services but also as co-inhabitants of China's urban areas (Wu and Gaubatz 2013; Hsing 2010). Hsing argues that urbanization is at the centre of the new policy priorities and policy discourse of China's urban leaders. The focus is on urban development projects that determine the dynamics of the local state and its relations with the market and society (Hsing 2010, 114–5). At the same time, urban residents with *hukou* have seen a rapid upgrading of their living environments (Wu and Gaubatz 2013). This urbanism is distinctive in its privileging of place production over industrial production (Hsing 2010, 114–5) and as argued in this book: governance over government.

China's cities are rapidly growing beyond their traditional physical boundaries and their politically constructed administrative hierarchies and borders. New city-regions, by some called mega-cities, are emerging, creating a new logic of scale production and governance in China's urban landscape. In response to economic globalization and attempts at re-centralizing power at the central level, they aim to develop regional economies through fostering of regional competitiveness. This entails administrative annexation of smaller territorial units by bigger ones, new integrated spatial plans at the regional level, and regional institution building (Wu 2016). Thus, while China used to be a planet unto itself, with its own traditions and experience in urban development and management, by some called a cellular structure, the country's economic and urban processes have now come to mirror and to play into socio-spatial transformations at the global level which are challenging the categories once used to describe, analyse, and even manage China's cities. Theoretically speaking, these transformations embody, to cite Brenner and Schmid (2014), the blurring and re-articulation of urban territories at different scales that challenge prevalent epistemological assumptions, categories of analysis, and objects of investigation within urban studies. China's urban dynamics and processes cast doubt on what Brenner called established 'methodological city-ist' explanations and understandings of the city and of urban processes, i.e. perceptions of the urban as a bounded, nodal, and relatively self-enclosed socio-spatial construction (Brenner 2014a). In an effort to move beyond traditional 'methodological city-ism' in urban

Unit of analysis	Open, variegated, multi-scalar: the urban as an unevenly developed yet worldwide condition and socio-spatial transformation
Model of territorial organization	Processual, dialectical: agglomerations ('cities') relate dialectically to their ('non-city') operational landscapes, which are in turn continually transformed through their roles in supporting agglomeration
Understanding of territorial development	Mediated through capitalism, state strategies and sociopolitical struggle: worldwide implosion/explosion of capitalist socio-spatial organization, encompassing the evolving relations between agglomerations and their operational landscapes within a crisis-prone capitalist economy
Model of <i>longue durée</i> historical-geographical change	Discontinuous, uneven: socio-spatial configurations (including both agglomerations and their operational landscapes) are creatively destroyed through the crisis-tendencies of capital (mediated through state institutions and sociopolitical struggles), contributing to successive rounds of territorial differentiation and re-differentiation of various spatial scales

Fig. 1 Urban theory without an outside. (Source: Brenner (2014a, 22))

studies, Brenner proposes an urban theory 'without an outside' (shown in Fig. 1)—a new approach to understanding the phenomenon he calls 'planetary urbanization'.

Brenner's model is a time-relevant and insightful *moment of theory* (we know what was there before it—i.e. 'methodological city-ism'—but not yet what comes after it). It involves a dialectical reading of 'the urban' as a systemic, world-spanning, and contradictory social condition. Yet such scepticism might easily result in a swing of the theoretical pendulum from the one extreme to the other, i.e. from imposing existing theories onto new territories, despite their greatly differing experiences, to embracing an extreme urban positivism, in which every city is treated as a special case (Peck 2015).

While we recognize these prospects, which can be either constructive or destructive, we are acutely aware that urban studies must develop in line with shifts in the global terrains of urbanization—one of these being the massive urbanization seen in Asian countries, not least China, in recent decades (McKinnon 2012). In the past, Asia and the rest of the so-called South were basically left out of urban studies or reduced to places in deficit as compared with Western cities, i.e. places characterized by disorder, poverty, informality, and so forth (Robinson 2006, 117). There was apparently little desire to examine or to understand urban processes in a wider comparative perspective, including the world outside the privileged West. However, it is critical for urban studies to incorporate the examination of cities in the 'global South', the 'East', and the 'post-colonies' on their own terms and not as exceptions, exoticisms, or theoretical anomalies (Peck 2015). China's experiences are important in this context, and Brenner's framework is helpful for examining and explaining the processual, dialectical, and disruptive nature of urbanization in that country.

At the same time, we recall that China has developed its own approaches to contemporary urban management (as defined above) and governance based on its historical experiences. Therefore, in order to avoid depicting China as a theoretical 'anomaly' or an outlier (cf. Peck 2015, 161), this volume dissociates Chinese experiences with urban green governance from essentializing theoretical paradigms,

while at the same time probing the applicability of urban governance theories to China. Our approach follows Peck's line of thinking that: 'It cannot be sufficient to hold singular cases at ambivalent distance from supposedly "offshore" theories' (Peck 2015, 162). Were we to focus on China's urban experience as a case unto itself, we would risk, as Schmid (2014, 2005) argues, failing to offer new insights into broader issues of global urbanization and its differentiated regional and local patterns. By focusing this volume on an understudied phenomenon—urban green governance in China—we hope to contribute to the global debate on sustainable urban development. Urban green governance, we suggest, is becoming an essential driver of urban processes globally, and what we observe in China is directly relevant elsewhere. It may also be productive to theorize new urban green governance structures, institutions, and processes that entail a multitude of political instruments in response to the behaviour of key stakeholder groups in urban regimes and processes at different scales (cf. Lund, Chap. 1) irrespective of the unique characteristics of China's party-state system.

Given the central role of the party-state in urban governance in China, it is important to examine the role it plays in the green urban transformation. To take one example, the party-state's massive planning system is still a key steering instrument in urban governance. The system dates back in part to the emergence of the socialist planned economy in the 1950s, but it is also rooted in China's imperial bureaucratic traditions. In combination, these two legacies make the planning system both pervasive and rigid. Structured along vertical lines, it stretches from the level of the State Council down to urban districts and rural counties. It also encompasses state-owned companies at various administrative levels (He et al., Chap. 3).

Furthermore, due to the complex nature of environmental issues, the effective implementation of policies to deal with them requires horizontal, cross-sectoral cooperation—and this has proven difficult within China's 'silo-ized' party-state system (cf. Delman, Chap. 8). China's local governments are facing huge challenges in integrating urban environmental plans with urban master plans and economic-development plans. In many cases the different plans are not coordinated (He et al., Chap. 3), and different city departments may take different or competing approaches to similar environmental challenges (Liu et al., Chap. 5). New ways of targeting policy interventions have therefore become important. Ren and Liu (Chap. 6) examine patterns of carbon consumption among different groups of citizens and argue strongly that a focus on high emitters will be necessary if public programmes to mitigate carbon emissions are to be implemented successfully.

In a wider perspective, this volume's focus on China's urban green governance also speaks directly to theoretical and policy debates outside China and within international organizations. Since the 1990s, Chinese specialists and leaders have recognized that cities are crucial for national and global sustainable development. The need for new governance regimes was initially anchored in a debate, originating within international development organizations, about 'good' governance. It was also recognized that the promotion of sustainable development and sustainability governance are intimately linked to the competitiveness of cities within the global economy (Qian 2008). In this sense, the most recent Chinese debate on urban devel-

opment has engaged directly with the challenges and consequences of globalization for the cities of the world. The idea of the 'global city' has become a household paradigm in Chinese politics and academic debate on urban questions (Zhou 2014). These theories have since come under criticism by some urban-studies theorists for being (in Peck's words) '...a(nother) case of heterodox urban theory being captured, co-opted and corrupted by the very power structures that were the impetus for the original critique' (Peck 2015, 164). However, this criticism has yet to find a foothold in the Chinese debate.

There could of course be arguments for differentiating between Western and Chinese theory and practice. Qian (2008) finds that the Chinese literature on urban sustainability governance is influenced strongly—perhaps too strongly—by neoliberal theory and by ideas of new public management (cf. Lund, Chap. 1), and this leads him to argue that there is a need also to consider Chinese values, China's political economy, and the country's specific social and cultural traditions when engaging with its approaches to urban governance. Still, Qian argues, from the outset, there has also been a recognition in China that multiple stakeholder governance must be part of the solution to the country's urban environmental and sustainability challenges. Local governments continue to be the primary agents of change, but they could not continue to act solely as controlling agents. They need to understand the wishes of their societal constituencies better. They must coordinate with the business sector and with social organizations and engage in mutually beneficial partnerships. They need to become more professional, transparent, and efficient in handling the political challenges they face. Finally, they must eventually secure popular participation in governance (Qian 2008; cf. Lund, Chap. 1).

Furthermore, in Qian's (2008) view, sustainability governance is concerned with redesigning the urban setting to become more livable. There is a need to establish policies and institutional frameworks for stakeholder coordination, especially with regard to participation by businesses and the public. The local state should be 'competitive' in performing its tasks and in enlisting stakeholder engagement (Qian 2008; cf. Schlæger and Zhou, Chap. 7; Delman, Chap. 8). Efforts to achieve sustainable development must be guided by specific plans, and the different levels of government have to be held to account through proper indicator systems (Qian 2008; cf. He et al., Chap. 3; Delman, Chap. 8). Finally, policies must be enacted to ensure that the pursuit of sustainable development is just and fair and that it does not result in greater social inequity (Qian 2008; Wang et al., Chap. 11).

As noted above, Chinese cities are incorporated into hierarchies of administrative status, regional importance, and size. The different administrative tiers have traditionally been associated with differential privileges, with lower levels being subordinate to and less privileged than higher levels. Since the post-Mao reforms of public administration in China started in the 1980s, this hierarchical privileging or, at times, underprivileging of cities has led to inter-city competition for status and resources. Party-state leaders and their administrations at various levels of government have used these dynamics as a lever to stimulate urban development. Competition within the fragmented hierarchical party-state has thus become a key driver of urban development, to the extent that urban leaders actively compete to

improve the standing of their city on hierarchical listings that focus on issues such as growth, branding, innovation, livability, and the environment (e.g. Chengshi paiheng, n.d.; Chengshi paiheng yu pingjia 2012). This competition is stimulated further by the party-state's system for assessing and controlling the performance of government organizations and their leaders (Delman, Chap. 8; Almén 2017). Hierarchization and comparison are also promoted by many academic studies to reflect and stimulate competitive thinking (e.g. Huan 2009). In Chap. 4, Luova analyses the implementation of environmental plans in two inner urban districts of Tianjin and shows how local characteristics lead to variation in policy implementation even at the level of urban districts due to such competition.

The 'procedures' or practices of modelling and inter-referencing thus become part of wider processes that entail national and international referencing and comparison. Ong (2011) refers to these phenomena as 'worlding' processes. They are distinctive, because they anchor globalization at the local level. City leaders look for antecedents to inspire them in their work with urban development (cf. Peck and Theodore 2010; Peck 2015), often with the assistance of experts or scholars. They internalize images and mappings of urban exemplars, thereby absorbing and then promoting the idea that it is possible and desirable to move up the status hierarchies (Bunnell 2015). These practices frequently involve policy mobility rather than direct policy transfer, through the creation of mental maps of 'best cities'. The policies embraced may inform future strategies (Bunnell 2015: 8) through the engagement of a range of 'agents, practices and performances involved in the social production and transformative circulation of forms of policy knowledge' (Bunnell 2015: 6). Practices of this kind resonate deeply with the Chinese tradition of policy experimentation and selective policy implementation under hierarchy (Heilmann 2007; Brehm and Svensson, Chap. 2; Luova, Chap. 4; Delman, Chap. 8). Urban experiments in environmental mitigation, for example, open up for unexpected opportunities which the pursuit of ecological practices affords to urban environments, spatial formations, and governance structures (cf. Mostafavi 2010).

However, while China's state-level green policies are increasingly ambitious and internationally referenced, local implementation often remains fragile or defiant, to the extent that it contradicts the much hyped experimental approach to policy implementation (Ran 2013; Kotska 2014). Brehm and Svensson, in a meso-level analysis of environmental model cities in Chap. 2, find that model-city programmes—as voluntary and incentive-based schemes for protecting and improving the urban environment—are exposed to system-inherent forces that lead to an increasing distance between programme objectives and local practices. With institutional elaboration and diffusion of the same model, the space for innovation in governance gradually narrows. Specific model schemes often come about in response to a top-down political paradigm, so it is difficult to uphold innovative impulses over time. In the end, a model scheme inevitably reaches a point of saturation. The end of a model scheme's lifecycle is reached once a competing programme offers new opportunities to gain political and economic rents (Brehm and Svensson, Chap. 2). Furthermore, many eco-city projects come under criticism for being diluted, due to compromises with entrepreneurial and technocentric local leaders (Joss and Molella

2013; de Jong et al. 2013); or else they are dismissed as a disguise for unsustainable land-development projects (Chien 2013).

In Jennifer Robinson's terms (2006, 1), this volume thus *takes the world of China's cities as its starting point*. We acknowledge the diversity and complexity of all cities, and therefore it could be perfectly possible to recognize or even theorize the city '...as a place of mobility, flow and everyday practices, and [to read] cities from their recurrent phenomenological patterns' (Amin and Thrift 2002, 7; cf. Lund, Chap. 1), but we also argue that urban processes need to be governed and that we find not only patterns of difference but also of similarity when we compare governance practices across cities. As Brenner notes (Fig. 1), the state is a strategic player. It mediates the (often disruptive) influences of capital, while simultaneously being engaged by sociopolitical struggles. The studies in this volume focus primarily on China's disrupted urban physical environments and on how the state and other actors act to mitigate the damage. This raises a series of questions regarding the execution of urban government and the governance of urban eco-sustainability challenges: Who governs the green transition? What is governed? How is it governed? What are the implications for China's urban green practices and for the established system of urban government? What are the implications of Chinese experiences for urbanism and urban studies? These are the questions that this book sets out to answer through its many case studies.

Structure of the Volume

The introduction above puts China's urban development into a historical and a theoretical perspective, arguing that China's urban development experience must be assessed on the basis of the country's own experiences with urban management. At the same time, China's engagement with the outside world, not least globalization since the late 1970s, has opened China's cities to international influence and global flows that allow us to apply contemporary urban theory to examining the governance of China's urban green transition. We also pinpoint the areas where China's experiences may help us redevelop and rearticulate the theories that we work with.

Section I Green Urban Governance: A Theoretical Perspective

In Section I of this volume, D. H. Lund (Chap. 1) contributes a guiding theoretical perspective on governance in relation to urban green and sustainable development. Based on her work on urban governance in the Nordic countries and with reference to the individual chapters in this volume, she contributes essential theoretical insights and substance as well as practical inspiration for the analysis of and reflection on urban green governance dynamics in China, and this thread is taken up and discussed in the Epilogue at the end of this volume. Lund notes that cities produce

many of the environmental challenges that societies all over the world face. They are great consumers of energy, of food, of water, and of land. They are also great producers of waste, including air pollutants, CO₂, and other greenhouse gases. Therefore, they have a great impact on ecosystems and on the conditions for human and non-human life. At the same time, they are crucial for economic growth, for innovation, and for employment in national economies. It is therefore in cities that governance for sustainability may find its most fertile soil, and if successful will have its greatest effect, argues Lund. She proceeds to ask what type of governance can promote sustainable urban development? She first addresses some of the elements in an urban transition towards sustainability, after which she considers three governance paradigms—traditional public administration (TPA), new public management (NPM), and new public governance/network governance (NG)—and their advantages and disadvantages in terms of sustainability. She draws on the mainstream Western literature on governance and on Nordic examples which are within her field of expertise. She concludes, however, upon reading the case studies in this volume that they reflect commonly accepted understandings of governance theory and exemplify a variety of hybrid governance arrangements at different scales and seen from different perspectives which together provide a solid foundation by which to reflect on governance dynamics and their potentials in terms of promoting systemic sustainable development, in China and elsewhere. Lund argues that the cases included here also show that, despite the evident differences between China and most of the Western world, in terms of governance in general, there are similar trends in terms of more polycentric governance, an extension of actors beyond institutionalized power structures who gain power in the efforts to combat environmental degradation, and also in some of the governance technologies applied to increase sustainability in particular from the NPM toolbox such as performance assessments, voluntary incentive schemes, and benchmarking. Therefore, the prospects for sustainable urban governance, she concludes, will depend on the ability of cities to choose appropriate hybrid governance paradigms and associated tools within the context of the Chinese political-administrative system.

Section II Policy Mobilization, Planning, and Implementation

While many of the chapters in this volume touch upon policy mobilization that aims to find new ways to improve urban green governance, the chapters in this section examine specific types of policy mobilization and implementation, through policy schemes for greening cities and at the city level (education); through attempts to improve China's disjuncted urban planning practices, especially with regard to urban environmental planning; through more focus on bottom-up practices and new network governance approaches in storm water management; and finally through examining how to differentiate between target groups for specific green interventions, *in casu* reduction of carbon emissions.

In Chap. 2, Stefan Brehm and Jesper Svensson argue that, since the 1980s, China's central government has created various model and incentive schemes aimed at systematically and concurrently promoting innovative approaches for protecting the urban ecological environment. In this context, programmes such as the 'model city for protecting the environment', 'garden city', 'eco-city', or 'low-carbon city' have become an integral part of China's system for urban environmental governance. However, the role of these policy-incentive schemes for promoting best practice is only partly understood. The study contributes to this literature with a conceptualization of model cities as a dynamic governance instrument. The analysis suggests that the distance between programme objectives and local practices increases with programme maturity. Model-city schemes inevitably reach a point of saturation once a competing programme provides new opportunities to gain political and economic rents.

Jia He, Cunkuan Bao, Jun Zhu, and Jinnan Wang argue in Chap. 3 that traditionally different sectors in China have developed different types of plans with a variety of purposes and that they have been implemented by a highly fragmented planning system. Thus, due to the lack of an overarching design for the planning system in toto, inconsistency, redundancy, and conflict are often observable in the process of making and implementing plans at all levels of administration, including the city level. To some extent, multi-planning integration may help to improve the effectiveness of implementation and to resolve contradictions among different types of plan. However, within the context of such multi-planning integration, the environmental plan at city level faces not only new opportunities but also some new challenges. For example, although thousands of environmental plans have been issued in practice, the development of legislation and academic studies in this area have somehow slowed down, and few technical documents or guidelines have been issued by the environmental authorities to guide the implementation of them. The authors review the history of the environmental plan, discuss its relationship with other plans, and analyse the main challenges. They take Benxi City in Liaoning Province as a case showing how an integrated Urban Environmental Master Plan can be designed in practice. Finally, they offer some suggestions for future improvement.

Outi Luova examines implementation of environmental education policies in Tianjin in Chap. 4. She argues that environmental policies are cross-sectoral by nature and that during their implementation they have to be adapted to the differing contexts of different sectors. Still, she notes that there is variation in the implementation process between different geographical areas. Luova's study looks at how two inner urban districts in the city of Tianjin (one poor and one wealthy) implement their new environmental plans in the educational sector. Chinese urban districts have substantial freedom to adapt educational policies to fit local conditions, and schools themselves are encouraged to define and to emphasize their own specific priorities. Under these circumstances, how can environmental-policy goals be reached in an effective way, asks Luova? Her findings show that, with regard to numerical targets, the poor district did better than the rich one. This was because a green profile was cheap to acquire, it opened the door to substantial external fund-

ing, and it made possible an improved bargaining position vis-à-vis the city government. However, the rich district was able to provide solid resources for its schools, enabling them to excel in terms of qualitative objectives, i.e. nurturing green lifestyles and promoting respect for the environment. The study highlights (1) specific features of environmental-policy implementation in the educational sector, (2) variety in policy-implementation processes in inner urban districts, and (3) the importance of clear qualitative targets in the definition of policy goals.

In Chap. 5, Li Liu and her co-authors examine urban water management in the two capital cities, Beijing and Copenhagen. Their basic argument is that cities play a critical role for the sustainable management of planetary freshwater. At the same time, cities need to adapt to climate change. This offers cities an opportunity to improve freshwater management. The authors first describe the status of urban water management in the two capitals, from the standpoint of sustainable development and climate resilience. In particular, they look into the degree to which the local water balance has been displaced. They review key water challenges and instruments falling within the range of traditional public administration (TPA), new public management (NPM), and network governance (NG) in both cities. They then consider the potential impact of these instruments and the relevance of a green-infrastructure approach through improved urban sustainability governance. They find that neither Beijing nor Copenhagen can neglect to make some use of top-down approaches (TPA and NPM) with centralized hardware systems, strategic planning, and management. However, there is a great potential to inject more in the way of bottom-up practices (NG) into the mix of governance instruments, thereby improving water supply, wastewater management, and storm water management in a sustainable way. They also find that Copenhagen's successes in using NG approaches may serve to inspire Beijing. Further, both cities could seek a greater reliance on NG to find alternative approaches to managing floods and storm water through urban landscapes and develop associated mechanisms to engage a wider range of actors from both public and private sectors. The attraction of NG becomes yet more evident when the authors link issues of storm water management to questions of water supply and wastewater management, given that decentralized storm water facilities can provide water-supply resources and alleviate pressures on municipal wastewater treatment.

In Chap. 6, Yuan Ren and Liu Daisong divide urban residents' direct carbon emissions into two categories: residential energy consumption-related carbon emissions and transportation-related carbon emissions (TCEs). Based on a survey of urban residents' carbon consumption that the authors conducted in Shanghai in 2013, the authors analyse demographic and socioeconomic characteristics of high emitter and demonstrate the inequality of carbon emissions among different groups by income, consumption, and lifestyle. Ren and Liu conclude that high emitters should bear more social responsibility than others to help achieve a transition to a low-carbon society, and they discuss how to encourage changes in their lifestyle so as to facilitate this transition.

Section III The State's New Tools of Green Urban Governance

In recent years, local governments in China have become more sophisticated in adopting new and more diverse tools to improve urban green governance. While the development of these tools is often initiated and guided from the top, the tools may deliberately aim at engaging the public in ways that make local governance more transparent and accountable and at times also engage citizens in co-producing the information, the tools, and also the possible solutions.

In Chap. 7, Schlæger and Zhou explore new technology as an integrative mechanism in urban environmental governance in China. The added value of this approach lies in its focus on how ICT (information and communication technology) affects administration from both a top-down and a bottom-up perspective. Their main finding is that digital environmental monitoring serves to level out some of the information asymmetry between central government principals and local level agents, thus paving the way for a more centralized model of environmental urban governance in China that strengthens the power of the central state. Schlæger and Zhou also note, however, that ICT has facilitated a shift on to a more sustainable path of development, by making information about the ills of environmental degradation available to a broader group of citizens. In fact, citizens now enjoy increasing opportunities to participate in the co-production of basic public environmental services. In sum, the effect on environmental governance is to make local governments more open to control, both from above (through systems of centralized control) and from below (through citizen-activated fire alarms). Even so, many of the systems and software applications examined in their study are still in an early phase of adoption; therefore, their conclusions must be seen as indicative of the direction of development of use of information and communication technologies in urban green governance.

In Chap. 8, Jørgen Delman asks whether Hangzhou's system of public-sector performance reviews promotes sustainability governance in the city. First, he examines how ideas and concepts relating to sustainable urban development are incorporated into urban development programmes in Hangzhou. He then focuses on the design of the system for performance reviews of party-state organizations and their leaders. Performance reviews comprise a variety of measures for performance assessment and performance management. These procedures have increasingly come to involve social participation, in order to allow for a public voice and public participation in governance. His analysis demonstrates how the city's public performance review and management system incentivizes major government departments working with sustainability-related issues to toe the green Communist Party line. Even more, innovative provisions to enhance the public accountability of the local government may also help to promote green governance in Hangzhou. This may pave the way, he argues, for narrowing the well-known implementation gap in connection with implementation of urban environmental policies.

Section IV Society Knocking on the Door

While the Chinese Party-state is continuously experimenting with its approach to addressing China's environmental crisis at the local level of implementation, there is no denying that social or civil society activism has played a crucial role in forcing local governments to open up and become more inclusive in their approaches. Citizens contest local decisions, projects, or environmental incidents by taking to the streets and to social media. Local NGOs pursue policy lobbying. They may not always win their case, but they often manage to elicit concessions. The issue of proper or adequate justice is often at stake, and one of the chapters argues the need to focus on practising *green justice* with a long-term perspective to improve urban green governance in the interests of all the relevant stakeholders, not least citizens who are often driven by not-in-my-backyard considerations. Eventually, China's local state must change its governance structure, argues Zhang Changdong in Chap. 12, from a state-led model to one of state-society collaboration.

In Chap. 9, Jun Liu examines how online activism against a specific type of a potentially polluting industrial project travels across China from one urban region to another, thus linking urban communities of protest together across regions. Since the emergence of the environmental crisis in China in the early 1990s, Liu notes that environmental social activism has emerged as a key type of digital activism, as well as a major challenge to urban governance. While scholars have studied issues arising from digital activism in general and environmental activism in particular, most have failed to scrutinize the possible interconnections among different instances of digitally mediated political contention. To advance such an understanding, he employs the concept of 'cycles of contention' in his study—a concept helpful for investigating recurrent mechanisms of protest in contemporary society. His case comprises seven anti-PX (anti-petrochemical) environmental protests in China between 2007 and 2014. During this period, he conducted 54 in-depth interviews. He found that the coverage in the traditional media, on the one hand, served to legitimize and to modularize these anti-PX protests, thereby facilitating the adoption of digital media as part of the repertoire of contention, which helped making political contention sustainable over the long run. The use of digital media, on the other hand, enabled protestors to diffuse contention widely and quickly and to learn from past experiences. He concludes that, as a new challenge to urban governance, digitally mediated environmental activism is shaped by the specific communication ecology in China.

In Chap. 10, Burell and Almén examine the consequences of social protests for environmental governance in China. Environmental protection is a policy area where the party-state has allowed civil society to play an increasingly important role. Chinese citizens can take part in state-sanctioned forms of political participation, but one of the most important ways they can influence policy is by protesting.

If we are to understand urban environmental governance in China, the authors argue, we must study the impact of such protests. Students of social movements in China have made great efforts to understand what explains protest success in that country. But the authors contend that, in order to understand environmental governance, we must look at all the different outcomes of a social protest. In most cases a protest elicits at least some concessions from the authorities, even when the protesters themselves perceive it as a failure. The study examines environmental governance by looking at the varying outcomes of three different waves of environmental protest in Hangzhou. Protests may lead to the development of new institutional tools such as dialogue platforms or involve external actors like courts or NGOs. Through these mechanisms, citizen protests come to form a new and important element in China's fragmented system of governance.

In Chap. 11, Wang Jiang Li and her co-authors review a public protest against the construction of a waste incineration power plant in 2014 in Yuhang District, Hangzhou. The authors reflect on the absence of justice between the residents and the local government from the perspectives of procedural justice and spatial justice, respectively, which are the core dimensions of *green justice*, a holistic philosophical perspective on the relation between humans and nature. They argue that not-in-my-backyard (NIMBY) movements and closed local governmental decision-making processes are the major cause of such conflicts, which is a very common dilemma of environmental governance in the process of China's urbanization. To build a waste incineration power plant is not only a concrete measure of environmental governance but also a protection for good quality of civic lives, which reflects the overall need of urbanization. Therefore, the authors argue that the relevant parties, i.e. governments, residents, and interest groups, need to adhere to green justice and holism to deal with public bads like garbage and subsequently share the environmental public goods based on common and long-term interests.

In Chap. 12, Zhang Changdong argues that sustainable development requires that China's governance structure be changed: from a state-led model to one of state-society collaboration, in which both government initiatives and civic engagement are found. Over the last decade, which saw rapid economic growth together with rising concerns about unsustainability, the Chinese government started to address the problem of sustainability. At the same time, many non-governmental organizations (NGOs) have been trying—regardless of their varying degrees of dependence on the state—to promote urban sustainable development, among other things by lobbying the local (authoritarian) government to bring a variety of stakeholders into the policy-making process. Using comparative case studies and a quantitative analysis of policy lobbying by NGOs, Zhang found that many NGOs were able to influence government policy-making through various channels. At the same time, the quantitative evidence suggests that sustainability-related NGOs—i.e. NGOs dedicated to the defence of the environment and of vulnerable social groups—have a degree of policy influence.

Finally, in the Epilogue, we summarize the main findings of the volume and elicit how they contribute to our understanding of urban green governance in China and to what extent the Chinese experience can be helpful in refining our theoretical understanding of how urban development processes are governed.

Copenhagen, Turku, Uppsala and Shanghai, 13 December 2017

References

- Almén, O. (2017). Participatory innovations under authoritarianism: Accountability and responsiveness in Hangzhou's social assessment of government performance. *Journal of Contemporary China*, publ.mon-line 28.10. <https://doi.org/10.1080/10670564.2018.1389003>
- Amin, A., & Thrift, N. (2002). *Cities*. Cambridge: Polity.
- Baumlmer, A., Ijjasz-Vasquez, E., & Mehndiratta, S. (Eds.). (2012). *Sustainable low-carbon city development in China*. Washington, DC: World Bank.
- Bosker, Bianca (2014). Why haven't China's cities learned from America's mistakes? *The Guardian*, 20 August.
- Brenner, N. (2014a). Introduction: urban theory without an outside. Brenner (ed) (2014), pp. 14–30.
- Brenner, N. (Ed.). (2014b). *Implosions/explosions. towards a study of planetary urbanization*. Berlin, jovis Verlag GmbH.
- Brenner, N., & Schmid, C. (2014). Planetary urbanization. Brenner (ed.) (2014), pp. 160–163.
- Brødsgaard, K. E. (ed.). (2016). *Earthquakes, energy, and the environment: Fragmented authoritarianism in China Today* (working title). Routledge.
- Bunnell, T. (2015). Antecedent cities and inter-referencing effects: Learning from and extending beyond critiques of neoliberalisation. *Urban Studies*, 52(11), 1983–2000.
- Chengshi paiheng yu pingjia. (2012). 城市排行与评价(南京专辑). 信息摘编(金陵图书馆编), 第1期(总第112期), 30 January.
- Chengshi paiheng (城市排行) (n.d.). 中国城市环境宜居指数排名. [Chinacity.org.cn](http://www.chinacity.org.cn), <http://www.chinacity.org.cn/csph/csph/63949.html>. Accessed 29 June 2016.
- Chien, S. S. (2013). Chinese eco-cities: A perspective of land-speculation-oriented local entrepreneurialism. *China Information*, 27, 73–96.
- China Daily. (2017). *CPC has nearly 89.5m members*. 30 June, http://www.chinadaily.com.cn/china/2017-06/30/content_29952238.htm. Accessed 20 Oct 2017.
- China Ecological. (2012). *China ecological footprint report 2012. Consumption, production and sustainable development*. WWF, Institute of Geographic Sciences and Natural Resources Research (CAS), Global Footprint Network, Institute of Zoology (CAS), Zoological Society of London. http://awsassets.panda.org/downloads/china_ecological_footprint_report_2012_small.pdf. Accessed 3 Jan 2013.
- de Jong, M., Wang, D., & Yu, C. (2013). Exploring the relevance of the eco-city concept in China: The case of Shenzhen Sino-Dutch Low Carbon City. *Journal of Urban Technology*, 20(1), 95–113.
- Delman, J. (2014). Climate change politics and Hangzhou's green city making. In E. Björner & P. O. Berg (Eds.), *Branding Chinese mega-cities: Policies, practices, and positioning* (pp. 249–261). Cheltenham: Edgar Elgar Publishers.

- Delman, J. (2016a). Ny motor i Danmarks forhold til Kina: Strategisk myndighedssamarbejde [New motor in Denmark's relations with China: Authority-to-authority collaboration]. Sørensen, Camilla og Delman, Jørgen (red.) (2016), Særunummer af *Økonomi og Politik*, 'Dansk Kina-politik—fra spørgsmål om eksport og danske arbejdspladser til ny verdensorden' [Danish China policy—from questions about exports and Danish jobs to a new world order], April, pp. 23–32.
- Delman, J. (2016b). Urban climate change politics in China: Fragmented authoritarianism and governance innovations in Hangzhou. Brødsgaard, pp. 156–180.
- Elvin, M. (1973). *The patterns of the Chinese past*. Stanford: Stanford University Press.
- Elvin, M. (2004). *The retreat of the elephants—An environmental history of China*. New Haven/London: Yale University Press.
- Fay, M., Wang, J.-z., Draugelis, G., & Deichmann, U. (2014). Role of green governance in achieving sustainable urbanization in China. *China & World Economy*, 22(5), 19–36.
- Guojia. (2014). 国家新型城镇化规划(2014—2020年). 人民网-人民日报, 17 March. <http://house.people.com.cn/n/2014/0317/c164220-24650538.html>. Accessed 25 Mar 2014.
- He, B., & Thøgersen, S. (2010). Giving the people a voice? Experiments with consultative authoritarian institutions in China. *Journal of Contemporary China*, 19(66), 675–692.
- Heilmann, S. (2007). Policy experimentation in China's economic rise. *Studies in Comparative International Development*, 43(1), 1–26.
- Heilmann, S. (2008). From local experiments to national policy: The origins of China's distinctive policy process. *The China Journal*, 59, 1–30.
- Hewitt, D. (2015). China's anti-corruption Campaign: Top Beijing and Shanghai officials under investigation as probe deepens. *International Business Times*, 11 November 2015. <http://www.ibtimes.com/chinas-anti-corruption-campaign-top-beijing-shanghai-officials-under-investigation-2179252>. Accessed 29 June 2016.
- Hsing, Y.-t. (2010). *The great urban transformation. Politics of land and property in China*. Oxford/New York: Oxford University Press.
- Hu, J. (2012). Firmly march on the path of socialism with Chinese characteristics and strive to complete the building of a moderately prosperous society in all respects: Report to the Eighteenth National Congress of the Communist Party of China on November 8, 2012, http://language.chinadaily.com.cn/news/2012-11/19/content_15941774.htm. Accessed 2 July 2016.
- Huan, Qingzhi (郝庆治). (2009). 城市可持续性与生态文明: 对青岛、承德和苏州的比较. 马克思主义与现实, no. 2.
- Joss, S., & Molella, A. P. (2013). The eco-city as urban technology: Perspectives on Caofeidian International Eco-City (China). *Journal of Urban Technology*, 20(1), 115–137.
- Kassiola, Joel Jay, Sujian Guo (2010). China's environmental crisis: Domestic and global political impacts and responses. Houndmills, Basingstoke: Palgrave Macmillan.
- Kostka, G. (2014). Barriers to the implementation of environmental policies at the local level in China. *World Bank Policy Research Working Paper*. In WPS7016 (August).
- Lefebvre, H. (2014/1989). Dissolving city, planetary metamorphosis. Brenner (ed.) (2014), pp. 566–570 (Translation by Laurent Corroyer, Marianne Potvin and Neil Brenner of: Lefebvre, Henri (1989). Quand la Ville se perd dans une métamorphose planétaire. *Le monde diplomatique*, May).
- Lianghui. (2016). 两会授权发布中华人民共和国国民经济和社会发展第十三个五年规划纲要. 新华社, 17 March, http://news.xinhuanet.com/politics/2016lh/2016-03/17/c_1118366322.htm. Accessed 7 July 2016.
- Lieberthal, K., & Oksenberg, M. (1988). Policy making in China. In *Leaders, structures and processes*. Princeton: Princeton University Press.

- Lin, G. C. S., Li, X., Yang, F. F., & Hu, F. Z. Y. (2014). Strategizing urbanism in the era of neoliberalization: State power reshuffling, land development and municipal finance in urbanizing China. *Urban Studies*, XX(X), 1–21.
- McKinnon, M. (2011). *Asian cities. Globalization, urbanization and nation-building*. Copenhagen: Nias Press.
- Miller, A. (2008). The CCP Central Committee's leading small groups. *China Leadership Review*, 26(September), 1–21.
- Mol, A. P. J., & Carter, N. T. (2006). China's environmental governance in transition. *Environmental Politics*, 15(2), 149–170.
- Mostafavi, M. (2010). Why ecological urbanism? why now? *Harvard Design Magazine*, 32 (*Design Practices Now*), 1 Spring/Summer, online: <http://www.harvarddesignmagazine.org/issues/32/why-ecological-urbanism-why-now>. Accessed 29 June 2016.
- Ohshita, S., et al. (2012). The role of Chinese cities in greenhouse gas emission reduction. In *Briefing on urban energy use and greenhouse gas emissions*. Berkeley: Lawrence Berkeley National Laboratory.
- Ong, A. (2011). Introduction. Worlding cities, or the art of being global. In A. Roy & A. Ong (Eds.), *Worlding cities. Asian experiments and the art of being global* (pp. 1–26). Chichester: Wiley.
- Peck, J. (2015). Cities beyond compare? *Regional Studies*, 49(1), 160–182.
- Peck, J., & Theodore, N. (2010). Mobilizing policy: Models, methods, and mutations. *Geoforum*, 41, 169–174.
- Qian, Z (钱振明). (2008). 基于可持续发展的中国城市治理体系:理论阐释与行动分析.城市
发展研究(城市治理 section)15卷, 3期. *Urban Studies*, 15(3), pp. 150–155.
- Qiu, B (仇保兴). (2006). 紧凑度和多样性——我国城市可持续发展的核心理念. 城市规划
30.11: 18–24.
- Ran, R. (2013). Perverse incentive structure and policy implementation gap in China's local environmental politics. *Journal of Environmental Policy & Planning*, 15(1), 17–39.
- Rivers, M., & Chung, S. (2016). Future Chinese skylines could look more uniform. *CNN Style*, 22 February. <http://edition.cnn.com/2016/02/22/architecture/china-weird-buildings/>. Accessed 26 June 2016.
- Robinson, J. (2006). *Ordinary cities*. London: Routledge.
- Schmid, C. (2014). Patterns and pathways of global urbanization: Towards comparative analysis. *Brenner and Schmid, 2014*, 203–217.
- Teets, J. (2014). *Civil society under authoritarianism: The China model*. New York: Cambridge University Press.
- United Nations. (1987). *Report of the world commission on environment and development*. General Assembly Resolution 42/187, 11 December.
- United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development*. General Assembly Resolution, 25 September http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E. Accessed 11 Aug 2016.
- Witt, M. A., & Redding, G. (2012). China: Authoritarian capitalism. In M. A. Witt & G. Redding (Eds.), *The Oxford handbook of Asian business systems* (pp. 11–32). Oxford: Oxford University Press.
- World Commission on Environment and Development. (1987). *Our common future*. Oxford: Oxford University Press.
- Wu, F. (2016). China's emergent city-region governance: A new form of state spatial selectivity through state-orchestrated rescaling. *International Journal of Urban and Regional Research*, 40(6), 1134–1151.
- Wu, W., & Gaubatz, P. (2013). *The Chinese City*. London/New York: Routledge.

- Xi, J. (2017). Xi Jinping report to 19th Congress (full text) (习近平十九大报告(全文)). *Xinhua News* (新华网), 18 October. http://finance.sina.com.cn/money/bank/bank_hydt/2017-10-18/doc-ifymviyp2268296.shtml. Accessed 18 Oct 2017.
- Xinhua News Agency. (2013). The decision on major issues concerning comprehensively deepening reforms(adopted at the close of the third plenary session of the 18th CPC central committee on November 12, 2013 (中共中央关于全面深化改革若干重大问题的决定:2013年11月12日中国共产党第十八届中央委员会第三次全体会议通过),<http://cpc.people.com.cn/n/2013/1115/c64094-23559163.html>. Accessed 2 July 2016.
- Yan, Y. (2010). The Chinese path to individualization. *The British Journal of Sociology*, 61(3), 489–512.
- Yao, X. Y. (2011). Accelerating rural urbanization: Risk is higher than the opportunities. *Exploration and Free Views*, 2, 24–26.
- Yu, A. T. W., Yuzhe, W., Zheng, B., Xiaoling, Z., & Liyin, S. (2014). Identifying risk factors of urban-rural conflict in urbanization: A case of China. *Habitat International*, 44, 177–185.
- Zhonggong Zhongyang. (2015). 中共中央国务院印发《生态文明体制改革总体方案》, 人民日报, 22 September. <http://politics.people.com.cn/n/2015/0922/c1001-27616151.html>. Accessed 5 Oct 2015.
- Zhonggong Zhongyang. (2016). 中共中央 国务院关于进一步加强城市规划建设管理工作的若干意见. 21 February. http://politics.people.com.cn/n1/2016/0221/c1001-28137648.html?utm_source=The+Sinocism+China+Newsletter&utm_campaign=1be1ce814b-Sinocism02_21_162_21_2016&utm_medium=email&utm_term=0_171f237867-1be1ce814b-29620869&mc_cid=1be1ce814b&mc_eid=bf60dc29d9. Accessed 24 Feb 2016.
- Zhou, Z. (2014). *A study on globalizing cities. Theoretical frameworks and China's modes*. Hackensack: World Century Publishing Corporation.