



Routledge Studies in Urbanism and the City

ECO AND LOW-CARBON NEW TOWNS IN CHINA

**SUSTAINABILITY TRANSFORMATION
IN THE MAKING**

Yang Fu and Xiaoling Zhang



Eco and Low-Carbon New Towns in China

This book examines the sustainability transition theory in the context of urbanization in China, tracing the development of eco and low-carbon cities. It examines how ideas on building eco-cities and low-carbon cities travel from nation to nation, how they are adopted in the Chinese administrative context and what role inter-scalar actors play in getting the ideas transferred, translated and operationalized on the ground.

Offering an overarching theoretical framework that incorporates all urban sustainability experiments in China, the book conducts a comprehensive analysis of the master plans of these new towns and summarizes the normative transition targets of sustainable urban experiments. It explores how they differ from each other and how they influence transition dynamics in practice. By examining four eco and low-carbon new towns deemed representative of current major approaches to sustainability transition management in China, the book provides a detailed depiction of generic transition management and explains the different transitional trajectories for each type of sustainable urban experiment. It demonstrates how subnational-level and city-level transitions mediate the national transition. Through a thorough inquiry into inter-scalar dynamics, institutional arrangements and techno-social innovations in sustainable urban experiments, the book links generalized transition rules and specific contexts to present a full view of the challenges, failures and territorial problems of eco and low-carbon new towns.

This book makes a novel contribution to the study of Chinese urbanization by revisiting issues and problems of contemporary urban China. The reflection on these urban issues will provide implications to policymakers, professionals and the common reader interested in the future sustainable urbanism in China.

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Abbreviations

ASEO	Adapting Singapore's Experience Office
BND	Binhai New District
CRCC	China Railway Construction Corporation
CSSD	China-Singapore Suzhou Industrial Park Development Co., Ltd
FDI	foreign direct investment
GBI	Green Building Institute (of SSTECH)
IV	(SSTECH) Investment Venture (Sino-Singapore Tianjin Eco-city)
JSC	Joint Steering Committee
JV	(SSTECH) Joint Venture (Sino-Singapore Tianjin Eco-city)
JWC	Joint Working Committee
MLP	Multi-level Perspective Analysis
MOHURD	Ministry of Housing and Urban-Rural Development
MSASAC	The Municipal State-owned Assets Supervision and Administration Commission
NDRC	National Development and Reform Commission
OCT	Overseas Chinese Town Ltd.
PFTZ	Pilot Free Trade Zones
PRD	Pearl River Delta region
QSM	Quantitative System Modeling
SEZ	special economic zone
SEZCDG	The Special Economic Zone Construction and Development Group
SILCC	Shenzhen International Low-carbon City
SIP	Suzhou Industrial Park
SIPAC	The Suzhou Industrial Park Administration Committee
SIPC	Suzhou Industrial Park Corporation
SND	Suzhou New District
SSPO	Singapore Software Project Office
SSTECH	Sino-Singapore Tianjin Eco-city
WCEND	Western Central Eco New District
WCENT	Western Central Eco New Town

Foreword

Sustainable urbanization is a popular topic for research. This is understandable, given the attractive combination of the two. Cities and urbanization are believed to generate more innovation and higher economic growth, while the environment and sustainability suggest a greener and more ecologically sound context in which this is all taking place. In a world where citizens and consumers expect ever further rising levels of wealth, comfort and livability, but planet earth seems to have only a limited amount of resources to accommodate these expectations, the combination sustainable urbanization is close to irresistible.

Eco cities and low carbon cities are two different but strongly related city labels incarnating this trend to embrace sustainable urbanization. Yet adopting a city label, effectively realizing veritable environment-friendly new town construction and stimulating long-term sustainable behavior on the part of residents are three crucially different things. In this book, Yang Fu and Xiaoling Zhang set out to examine how ideas on building eco cities and low carbon cities travel from nation to nation, how they are adopted in the Chinese administrative context and what role the governance power at multiple levels of government plays in getting the ideas transferred, translated and materialized on the ground. While doing that, they make use of a variety of state-of-the-art theoretical lenses helping them accomplish this task. Four cities, all of them familiar with and loved by scholars in sustainable urbanization in China, receive specific attention in the book: Suzhou, Tianjin, Shenzhen and Zhuhai.

It is not my task here to reveal the outcomes of their study nor already to highlight the vital explanatory mechanisms underlying these findings. Suffice it to say that it appears that to those cities that have shall be given even more. Strong donor countries, such as Singapore, can make a lot of difference in exporting their visions. Strong recipient cities, such as Shenzhen, also have a far easier task making ecological promises come true and become even richer and more attractive than before. Countries with insufficient funding resources to make massive investments and cities whose names nobody knows and which are not 'first or second tier' tend not to enjoy the same privileges. Those can only brand their new towns as 'eco' and hope nobody will notice their disappointing policy output. Be this as it may, it is clearly the interplay of the combination of different theories the authors present rather than any single one of them that tells the full story of how

ideas from abroad eventually find their material reflection in Chinese megacities of today. It is in these places that modern urban history is made.

On a personal note, I have been working on much the same topic in the past 10 years or so. I have seen all of the four cities they describe in their book and written about some of them. It is truly a pleasure to see that this work on envisioning ecotopias and building eco cities, sometimes necessarily from a rather critical perspective and piercing through carefully construed verbal screens on eco myths, is continued by the right people. People with the right passion and aptitude to do so, as the reader will experience. It has been my pleasure to meet and engage with the authors on several occasions, during conferences and workshops, over lunches and dinners, in places as different as Hangzhou, Ningbo, Shenzhen and Hong Kong. Each time we enjoyed a different type of Chinese fish, toasted on a different type of Chinese ‘wine’, had different Chinese and international eco-experts around us for exchange of opinions and prepared the options of different new publications to be co-authored. It always transpired to me that their hard work and tireless ambition to portray practices in sustainable urbanization in China and provide recommendations on future courses of action completely absorbed their minds. Sometimes even to the extent that they took their brains with them, but accidentally left their laptops elsewhere. And finally, they have also given me work to do: they suggest more future research on ‘inclusive cities’, yet another label in sustainable urbanization that deserves serious examination. And exactly that job I have taken on recently. Academic work seems endless.

But first things first: may the reader now enjoy this comprehensive publication on the Chinese transition to urban ecotopia and its material reflection in various new towns. Next time we pay these localities a visit, we will once again test the fish and wine they locally produce. The better and more natural their taste, the more we can be convinced of their ‘eco-label’. At the end of the day, quality of life in China is an issue of the round dinner table: bon appétit!

Martin de Jong
The Hague, 16 July 2020



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1 Introduction

1.1 Research background

Recent decades have witnessed a dramatic growth in China's economy, along with an increasingly heavy toll on the environment and society. Against this background, the Chinese government has initiated a number of large-scale new town projects to promote green urbanism and to promote a more sustainable trajectory of urbanization. Typical examples of these multi-billion-dollar projects are the eco-city and low-carbon city programs (Wu, 2012). Such projects were rarely seen before 2000, but sustainable urbanism in China gained momentum thereafter, as a tributary of the global turn towards urban sustainability. By 2016, Chinese cities listed in its eco and low-carbon schemes were 114 and 81 respectively. In terms of new town development, China has recently been experiencing a transition towards sustainability, not only from industrial-oriented to real estate-oriented urbanization, but also to ecological preservation and social development.

The prototype of sustainable cities dates back to the turn of the 20th century, when Howard introduced the concept of "garden city", an idealized vision of the integration of urban landscape with agricultural functions (Howard, 2010). Although this idea had a profound and lasting influence over urban planning and governance over the following century, it was a far cry from the concept of urban sustainability in contemporary discourse. It was not until the Brundtland Commission that the idea of the "sustainable city" in the modern sense came into being. Thereafter, urban sustainability concepts have ramified and mutated, with different focuses on the environment, economy and society.

In general, urban sustainability concepts and practices differ in two ways: their epistemological perception of sustainability, and the instrumental approaches proposed for realizing it. The conceptualization of sustainability can be loosely divided into two schools, "strong" and "weak" sustainability, which are associated with eco-centric and anthropocentric epistemology, respectively. The former highlights the preservation of the ecosystem and is skeptical about trade-offs among the social, economic and ecological realms. As for the latter, the differences are mainly instrumental. For example, smart and low-carbon cities rely

2 Introduction

more on techno-social innovations, whereas green cities and eco-cities focus more on urban planning and design.

Despite variations in the perception and practice of urban sustainability, green urbanism and sustainable urbanization have become so popular in the new millennium that exponential growth has occurred in the number of sustainable/green projects worldwide. Almost all urban experiments for sustainability transition rest on the presumption that the tension between economic development and ecological preservation is reconcilable (Bai, Roberts, & Chen, 2010). Admittedly, urban sustainability experiments and transitional management of urban new towns are based on the notion of weak sustainability, whose instrumental epistemology implies trade-offs and transformation between ecological, social and economic goals. Such a presumption bespeaks an optimism about ecological modernization, implying instrumental and techno-social solutions to urban problems. We must anchor our analysis and debate in the weak sustainability discourse because if we adhere to the strong sustainability discourse, the rationale is probably against any urban expansion.

For certain, systematic efforts have been made to promote an urban sustainability transition at the national and local levels in China. Multiple sustainable urban schemes were designed and advocated nationwide and gained momentum particularly after the turn of the new century (see section 2.2 for more details). Resources have also been mobilized at the local level to respond to the reorientation of the national urban agenda. One typical example is the proliferation of various types of sustainable new towns. Eco and low-carbon cities are the two leading national sustainable city schemes in the country, with distinctive transition targets and management approaches (Baeumler, Ijjasz-Vasquez, & Mehndiratta, 2012). In effect, the schemes are promoted across scales from provincial to district units. However, it is in new towns that institutional and techno-social innovations can be fully implemented, because everything starts from scratch. In addition, comparisons of sustainable new towns are on similar scales. Therefore, this book focuses on the sustainability transition of new towns in China to illuminate urban transition management in China on different scales.

In general, management approaches to the urban sustainability transition of new towns are closely related to two factors. The first is vertical endorsement from the political hierarchy; the other is involvement of foreign partners. The former must be understood within the context of Chinese political institutions and the politics of scales, whereas the latter is more closely related to policy and knowledge motilities in the international arena. Approaches to transition management are shaped substantially by institutional design in these two dimensions; they are also influenced by specific social, environmental and economic conditions in different localities. This consideration forms the underlying rationale for the comparative case studies.

Some flagship eco-city projects, such as China's Tianjin Eco-city, have long been the focus of research. Intercity and even intercountry competition is ever intensifying, and any project with the prospect of being an eco-city will

gain attention and be proposed as a model for the whole world. Indeed, it has become standard practice for countries to learn from models that are perceived as successful and to completely or partially replicate foreign experiments at home. This “lesson-drawing” and “voluntary policy transfer” process was first noticed and discussed in the 1990s and gradually bred many theoretical variations (Rose, 1993). Dolowitz and Marsh (Dolowitz & Marsh, 1996) summarized the main features, types and actors involved in the process of policy transfer and identified the factors that contribute to the successful replication of models.

In the wake of a sudden explosion in the number of massive green/sustainable urban projects, scholars have proposed concepts such as “policy boosterism” and “policy mobility” to explain why cities such as Singapore, Vancouver and Hong Kong have become models for the rest of the world and vigorously promoted and exported their experiences (McCann, 2013; McCann & Ward, 2012). Countries that are drawing lessons from model cities perceive the policy mobility process as a shortcut to gaining an edge in the intensifying global intercity competition. The notion of “assemblage urbanism” has been developed to conceptualize the fast and contested dissemination of policy knowledge around the world, often in concert with selective deployment of “diverse technologies seduction” and green/sustainable narratives (Bunnell & Das, 2010; González, 2011; McFarlane, 2011; Dolowitz & Marsh, 2000).

Policy mobility in green urbanism is one major pillar of urban sustainability transition in contemporary China, particularly for the national flagship eco and low-carbon new towns. However, there are many less high-profile sustainable new urban experiments implemented in other second- and third-tier cities, where vertical endorsement is weak and policy mobility from foreign partners is absent. In addition, local conditions are very different; some new towns start from scratch, whereas others are urban expansion or redevelopment projects. Territorial and institutional diversity across the country has meant that transition approaches differ significantly from each other. Research on eco and low-carbon new towns has been increasing, especially for flagship projects. It has, however, somewhat misrepresented the big picture of urban sustainability transition, due to an over-emphasis on flagship cases.

Despite the emergence of urban sustainability transition in China, many questions are still unanswered by conventional political-economy narratives in contemporary research. Therefore, this study uses an overarching analytical framework of sustainability transition and a multi-level perspective to investigate eco and low-carbon new towns in China. First, sustainability transition theory, as an analytical framework already applied in multiple research areas such as the energy sector, social policies, urban governance and urban development, has rarely been applied to urban systems in China. It can demystify the patterns of interaction between cross-scale actors and explain transition dynamics across different territorial contexts and management arrangements. More importantly, empirical implications can be generated from the practice of eco and low-carbon new towns for future transition management.

1.2 Research aims and questions

1.2.1 Research aims

Due to emerging trends of urban upscaling, reorientation of the national urbanization agenda, climate change and emphasis on ecological preservation, efforts have been mobilized at the national and local levels to follow a more sustainable urbanization trajectory. Although many studies have been made of eco and low-carbon new towns in China, they have a number of flaws. First, current studies focus disproportionately on flagship projects and first-tier cities and miss the larger national picture of urban sustainability transition. Most are case studies that follow the political-economy and neo-liberal paradigm and fail to delineate the interaction patterns and mechanisms between inter-scalar actors. They are unable to explain how and why different cases with distinctive territorial and institutional backgrounds reveal particular transition pathways and characteristics.

The spatial and temporal scales in contemporary studies are also implicit. Consequently, many problems are left unanswered or insufficiently addressed. What are the general normative ends and targets of urban sustainability transition? How do they influence local transition practice? What is the relationship between local transition practice and general transition targets at the national level? When are institutional and techno-social innovations for urban sustainability introduced? On which scale do they take place? How do they take place and interact with the existing regime? What are the distinctive interaction patterns between cross-scale actors with different institutional and territorial contexts? What are the corresponding challenges for sustainability transition management, and how can we improve transition management and governance with the implications generated from our current experience? The main aim of this study is to remedy the fragmented snapshots of political-economy narratives of eco and low-carbon new towns in China by introducing an overarching analytical framework of sustainability transition and a multi-level perspective analysis. It complements current research by tackling previously unanswered questions in this area.

First, this study aims to conceptualize sustainability transition of eco and low-carbon new towns on multiple functional scales and to provide an overarching explanatory framework for sustainable new town practices in China. It highlights the major actors, interaction patterns and inter-scalar dynamics between actors. An additional merit of the sustainability transition framework is that it adds a temporal scale to the analysis of transition practice. It can reveal the transition patterns, pathways, dilemmas and challenges of urban sustainability transition across a longer time span. Most importantly, it can explain transition dynamics and the formation of transition pathways.

Second, this study explores the normative transition targets of sustainable new towns. A comprehensive content analysis of the master plans of sustainable new towns (eco and low-carbon cities) is conducted. Targets of the content analysis are chosen based on geographical and institutional characteristics to maximize the study's generalizability and representativeness. More importantly, normative

targets for sustainability transition among various categories of sustainable new towns will likely differ substantially. If so, we must further explore how the normative ends and targets of sustainability transition influence the transition practice of these new towns and the relationship between local responses to urban sustainability transition and national requirements.

Third, this study investigates the sustainability transition of new towns in empirical cases. It is one thing to design normative transition targets in general and quite another to realize them. The choice of empirical transition cases is based on a taxonomy of sustainable new towns on two dimensions: the extent of vertical endorsement from the political hierarchy, and the degree of foreign involvement. Four comparative cases are used to examine the major transition patterns, pathways and challenges in major sustainability transition approaches among new towns in China. This study thus elaborates a matrix to illuminate the major transition patterns and pathways of sustainable new towns.

Finally, this study is intended to generate practical suggestions for the transition management of different approaches based on an analytical framework of sustainability transition and multi-level perspective (MLP). One major weakness of contemporary research that has critically revisited large-scale sustainable urban experiments is the lack of feasible suggestions for improvement in transition management. A multiscale analytical framework with a temporal focus can reveal the dilemmas, deadlocks and challenges in interactions between actors and generate empirical suggestions to translate macro-level pressures and increase local coordination to improve the transition management of new towns.

1.2.2 Research questions

Given these research aims, this book addresses the following research questions.

1 Normative and directive transition targets

What are the normative ends of sustainability transition for eco and low-carbon new towns in China?

2 Transition patterns, pathways, and characteristics

Why/how do the transition pathways and patterns differ from each other across major transition approaches?

3 Governance and management of future sustainability transition

How can transition management be improved with insights from comparative case studies?

1.3 Contribution and significance

This study is the first to use sustainability transition theory to comprehensively investigate the development of eco and low-carbon new towns in China. The combination of the research framework and empirical studies of new town transition

experiments will make innovative contributions to the theory of sustainability transition and empirical studies of sustainable new towns.

First, MLP and sustainability transition analyses have been conducted on multiple functional levels, particularly regarding the interaction patterns and mechanisms of inter-scalar actors, yet the spatial scale has largely been neglected. Such studies explain the functional level of transitions and the ways and times in which they take place, but they are less able to answer where they take place. Particularly on the subnational city level, where, when and how transition takes place needs to be investigated. More importantly, given that China is a country with great territorial and institutional diversity, urban sustainability transition and the development models of eco and low-carbon new towns are not monolithic. It is necessary to understand the relationship between normative transition targets in general and various transition practices across localities. More importantly, the relationships among the national urban transition agenda and diverse local practices must be illuminated. Through a systematic content analysis and empirical case studies of eco and low-carbon new towns in China, this study remedies the neglect of the spatial scale in sustainability transition theory and the MLP framework, explaining where innovations take place and how local practice mediates and interacts with the national transition agenda.

Sustainability transition theory and MLP also serve as an overarching framework to incorporate fragmented case studies of contemporary eco and low-carbon new towns in China. There are two major limitations in the current neo-liberal and political-economic narratives of sustainable new towns. One is the failure to clarify the rationales and linkages between various sustainable urban experiments and their rich institutional contexts, and how they are shaped by and also shape the sustainability transition of the national urban agenda. The other is that the temporal scale, which is extremely important for transition management and governance, is currently underexplored. Only by examining projects over a longer, continuous time span can one delineate the interactive mechanisms between actors and generate feasible empirical implications for future transition management. Using an overarching theoretical framework of sustainability transition and MLP, this book redresses these weaknesses through comparative case studies of major transition approaches in contemporary new towns in China.

This study summarizes and reflects on transition practice, providing a new taxonomy of urban sustainability transition in new towns. The transition pathways, interaction patterns between inter-scalar actors, challenges and prospects are all examined. This research also has theoretical implications for other related research areas. It revisits the politics of scales and examines horizontal fragmentation and vertical endorsement in the transition management of new towns. Policy mobility, which has been frequently discussed in urban studies, is reexamined and explained through the lens of transition, and its role in the transition management of new towns is highlighted. Furthermore, this study reflects on the role of policy mobility in transition management and how it has reshaped the landscape of transition. The discussion considers recent urban upscaling and sheds light on the scale problems and balanced development of new towns in the present era. The